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County of Hawai'i
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January 28, 2026

Mary Alice Evans
Director, Office of Planning and Sustainable Development
State of Hawai'i Department of Business, Economic Development and Tourism
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

SUBJECT: Draft Environmental Assessment and Anticipated Finding of No Significant Impact
Four Mile Creek Bridge [22-7] Replacement Project
State Contract No. 70723, County Contract No. C010415, County Job No. E-4678
Kīlauea Avenue, South Hilo District, Hawai'i Island

Dear Ms. Evans,

The County of Hawai'i, Department of Public Works (DPW) hereby submits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the Four Mile Creek Bridge [22-7] Replacement Project for publication in the next available edition of *The Environmental Notice*. Construction of the proposed project will affect portions of the Kīlauea Avenue and Haihai Street Right-of-Ways and portions of Tax Map Key parcels (3)2-2-048:001; (3)2-4-004:132; (3)2-4-045 Parcels 64, 65, 66, 68; and (3)2-2-043 Parcels 28, 29, 30, 31, 32, 41, 43, 102, 104, 105, 106, 125, 128, 135, and 136, in the South Hilo District, Hawai'i Island.

We are providing this DEA-AFONSI electronically via the online "HRS Chapter 343 Publication Submittal Form." This submittal includes a pdf file of the DEA-AFONSI and a .zip file containing a shapefile of the action location boundary.

Should you have any questions, please contact Alex Kalawe, P.E. of the DPW Engineering Division at (808) 961-8926 or at alexanderk.kalawe@hawaiicounty.gov.

Wesley R. Segawa

JTS

Wesley R. Segawa, P.E.
Director, County of Hawai'i Department of Public Works

AKA

From: dbedt.opsd.erp@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Monday, March 16, 2026 8:53:12 AM

Action Name

Four Mile Creek Bridge [22-7] Replacement Project

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
- (2) Propose any use within any land classified as a conservation district
- (7) Propose any reclassification of any land classified as a conservation district

Judicial district

South Hilo, Hawai‘i

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

(3)2-2-048:001; (3)2-4-004:132; (3)2-2-043:028; (3)2-2-043:029; (3)2-2-043:030; (3)2-2-043:031; (3)2-2-043:032; (3)2-2-043:041; (3)2-2-043:043; (3)2-2-043:102; (3)2-2-043:104; (3)2-2-043:105; (3)2-2-043:106; (3)2-2-043:125; (3)2-2-043:128; (3)2-2-043:135; (3)2-2-043:136; (3)2-4-045:064; (3)2-4-045:065; (3)2-4-045:066; (3)2-4-045:068

Action type

Agency

Other required permits and approvals

Federal: Clean Water Act Section 402 National Pollutant Discharge Elimination System Permit State: Conservation District Use Permit; Community Noise Permit; Disability and Communication Access Board Review and Approval; Clean Air Branch Permit; ROW Acquisition Approval from Division of Land and Natural Resources (DLNR) Land Division. County of Hawai‘i: Grading, Grubbing, and Stockpiling Permits; Building Permit; Flood Development Permit.

Proposing/determining agency

County of Hawai‘i Department of Public Works

Agency jurisdiction

County of Hawai‘i

Agency contact name

Alex Kalawe

Agency contact email (for info about the action)

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Email address for receiving comments

FourMileCreek@haleyaldrich.com

Agency contact phone

(808) 961-8626

Agency address

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Suite 7
Hilo, HI 96720
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Haley & Aldrich, Inc.

Consultant contact name

Taylor Chock

Consultant contact email

tchock@haleyaldrich.com

Consultant contact phone

(808) 470-2081

Consultant address

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Suite 6-250
Honolulu, HI, 96813, HI 96813
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Map It

Action summary

The County of Hawai'i Department of Public Works, in coordination with the State of Hawai'i Department of Transportation, proposes to replace, raise, and widen the Four Mile Creek Bridge to accommodate roadway and pedestrian facility improvements and improve overall safety along the adjacent segments of Kīlauea Avenue and Haihai Street. The one-lane Four Mile Creek Bridge was constructed in 1916 and altered to its current configuration in 1964. The existing bridge and superstructure will be removed in its entirety and replaced with a single-span concrete girder bridge that is more than three times wider and more than twice in length. The widened bridge will accommodate north- and south-bound through lanes, one left turn lane (westbound onto Haihai Street), bike lanes/shoulders, raised sidewalks, and buffers on both sides of the road. At the Kīlauea Avenue and Haihai Street intersection, a traffic signal will be installed, the east side of the intersection will be widened to accommodate the addition of the northbound and westbound left turn lanes, and Americans with Disabilities Act-accessible curb ramps will be installed. The project does not have federal funding and utilizes County and State of Hawai'i funds.

Reasons supporting determination

Please refer to DEA Section 5.1; Significance Criteria.

Attached documents (signed agency letter & EA/EIS)

- 2026_0313_HAI_Four-Mile-Creek-DEA-0206084-001_F_combined.pdf
- Appendix-D-Pre-consultation-Letters-and-Responses_with-fly-sheet_r.pdf
- 26.0128-Draft-DPW-Four-Mile-Creek-DEA-Transmittal-Letter_WRS_SIGNED.pdf

Action location map

- APE-Four-Mile-Creek.zip

Compliance certification (HRS §368-1.5):

The authorized individual listed below certifies that documents submitted are unlocked, searchable, and compliant with the Hawaii Electronic Information Technology Disability Access Standards (including, but not limited to transcripts, captions, and other descriptions accompanying audio/video files). The individual acknowledges that the submitter retains the responsibility for compliance after documents have been published and any compliance queries will be directed back to the agency and/or applicant.

Authorized individual

Taylor Chock

Authorized individual email

tchock@haleyaldrich.com

Authorized individual phone

(808) 470-2081

Authorization

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

HALEY ALDRICH

www.haleyaldrich.com

DRAFT ENVIRONMENTAL ASSESSMENT
FOUR MILE CREEK BRIDGE [22-7] REPLACEMENT PROJECT
KILAUEA AVENUE
SOUTH HILO DISTRICT, HAWAII ISLAND, HAWAII

Proposing/determining agency
County of Hawaii
Department Of Public Works
Aupuni Center
101 Pauahi Street, Suite 7
Hilo, Hi 96720-4224

Submitted pursuant to the
Hawaii Environmental Policy Act
Chapter 343, Hawaii Revised Statutes, and
Title 11, Chapter 200.1, Hawaii Administrative Rules

by the
County Of Hawaii
Department Of Public Works
Aupuni Center
101 Pauahi Street, Suite 7
Hilo, Hi 96720-4224

File No. 0206084
March 6, 2026

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List of Acronyms

Acronym/Abbreviation	Definition
AAQS	ambient air quality standards
AASHTO	American Association of State Highway and Transportation Officials
ACM	asbestos-containing material
ADA	Americans with Disabilities Act
ALRFI	Archaeological Literature Review and Field Inspection
AMSL	above mean sea level
bgs	below ground surface
BLNR	Board of Land and Natural Resources
BMP	best management practice
C&D	construction and demolition
CDP	Census Designated Place
CDUP	Conservation District Use Permit
CEJST	Climate and Economic Justice Screening Tool
CO	carbon monoxide
CO_2	carbon dioxide
County	County of Hawaii
CWA	Clean Water Act
CWRM	Commission on Water Resources Management
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act of 1972
dBA	maximum a-weighted decibel
DEM	Department of Environmental Management
DLNR	Department of Land and Natural Resources
DPW	Department of Public Works
DWS	Department of Water Supply
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
FHWA	Federal Highways Administration
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
HAR	Hawaii Administrative Rules
HDOH	State of Hawaii Department of Health

Acronym/Abbreviation	Definition
HDOT	State of Hawaii Department of Transportation
HECO	Hawaiian Electric Company, Inc.
HEPA	Hawaii Environmental Policy Act
HRS	Hawaii Revised Statutes
IPaC	Information for Planning and Consultation
MASH	Manual for Assessing Safety Hardware
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
O_3	ozone
OCCL	Office of Conservation and Coastal Lands
OPSD	Office of Planning and Sustainable Development
PIFWO	Pacific Islands Fish and Wildlife Office
$PM_{2.5}$	fine particulate matter less than 2.5 micrometers
PM_{10}	fine particulate matter less than 10 micrometers
ROW	right-of-way
SCAP	Stream Channel Alteration Permit
SHPD	State Historic Preservation Division
SMA	special management area
SLUD	State Land Use Division
SO_2	sulfur dioxide
SRTS	Safe Route to Schools
State	State of Hawaii
T&E	threatened and/or endangered
TMK	tax map key
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
WotUS	Waters of the United States
WQC	Water Quality Certification

Project Summary

Project Name:	Four Mile Creek Bridge [22-7] Replacement Project State Contract No. 70723 County Contract No. C010415, County Job No. E-4678
Proposing Agency:	County of Hawaii Department of Public Works
Project Location:	Waiakea Ahupuaa, South Hilo District, Hawaii Island
Tax Map Keys (TMKs):	Kilauea Avenue and Haihai Street right-of-way (3)2-4-045-999; portions of parcels (3)2-2-048:001; (3)2-4-004:132; (3)2-4-045 Parcels 64, 65, 66, 68; and (3)2-2-043 Parcels 28, 29, 30, 31, 32, 41, 43, 102, 104, 105, 106, 125, 128, 135, and 136
Land Area:	9.2 acres
Land Ownership:	Kilauea Avenue right-of-way – County of Hawaii Haihai Street right-of-way – County of Hawaii 2-2-048:001 - State of Hawaii (Panaewa Farm Lots) 2-4-004:132 –State of Hawaii, leased to private entity (Waiakea Homesteads 3rd Series) 2-2-043:028, 2-2-043:029, 2-2-043:030, 2-2-043:031, 2-2-043:032, 2-2-043:041, 2-2-043:043, 2-2-043:102, 2-2-043:104, 2-2-043:105, 2-2-043:106, 2-2-043:125, 2-2-043:128, 2-2-043:135, 2-2-043:136, 2-4-045:064, 2-4-045:065-066, and 2-4-045:068 – Various private owners
State Land Use District:	Urban and Conservation – General Use Subzone
Special Management Area	N/A
County Zoning Designation:	Open, Agriculture (A-1a and A-10a), Residential (RS-15)
Project Goal:	The County of Hawaii Department of Public Works, in coordination with the State of Hawaii Department of Transportation, proposes to replace, raise, and widen the Four Mile Creek Bridge to accommodate roadway and pedestrian facility improvements and improve overall safety along the adjacent segments of Kilauea Avenue and Haihai Street. The one-lane Four Mile Creek Bridge was constructed in 1916 and altered to its current configuration in 1964. The existing bridge and superstructure will be removed in its entirety and replaced with a single-span concrete girder bridge that is more than three times wider and more than twice in length. The widened bridge will accommodate north- and south-bound through lanes, one left turn lane (westbound onto Haihai Street), bike lanes/shoulders, raised sidewalks, and buffers on both sides of the road. At the Kilauea Avenue and Haihai Street intersection, a traffic signal will be installed, the east side of the intersection will be widened to accommodate the addition of the northbound and westbound left turn lanes, and Americans with Disabilities Act-accessible curb ramps will be installed. The project does not have federal funding and utilizes County and State of Hawaii funds.

Regulatory Context:	Hawaii Revised Statutes Chapter 343 Hawaii Administrative Rules Title 11, Chapter 200.1
Trigger for HRS Chapter 343:	Use within any land owned by the State or classified as a Conservation District (HRS §343-85 (a)(2)); Use of State or County Funds; Use of State or County Lands.
Anticipated Determination:	This draft Environmental Assessment concludes that the proposed project will not have significant adverse impacts on the environmental quality of the area and anticipates a Finding of No Significant Impact.
Direct Comments to:	FourMileCreek@haleyaldrich.com ATTN: Taylor Chock 500 Ala Moana Boulevard Suite 6-250 Honolulu, HI 96813

1. Introduction

1.1 PROJECT SUMMARY

The County of Hawaii (County) Department of Public Works (DPW), in coordination with the State of Hawaii Department of Transportation (HDOT), proposes to replace, raise, and widen the Four Mile Creek Bridge to accommodate roadway and pedestrian facility improvements and improve overall safety along the adjacent segments of Kilauea Avenue and Haihai Street. The one-lane Four Mile Creek Bridge was constructed in 1916 and altered to its current configuration in 1964.

The existing bridge and superstructure will be removed in its entirety and replaced with a single-span concrete girder bridge that is more than three times wider and more than twice in length. The widened bridge will accommodate north- and south-bound through lanes, one left turn lane (westbound onto Haihai Street), bike lanes/shoulders, raised sidewalks, and buffers on both sides of the road. At the Kilauea Avenue and Haihai Street intersection, a traffic signal will be installed, the east side of the intersection will be widened to accommodate the addition of the northbound and westbound left turn lanes, and Americans with Disabilities Act (ADA)-accessible curb ramps will be installed. The project does not have federal funding and utilizes County and State of Hawaii (State) funds.

In accordance with Hawaii Revised Statutes (HRS) Chapter 343 and Hawaii Administrative Rules (HAR) Title 11, Chapter 200.1, the County is anticipating a Finding of No Significant Impact for the proposed project. This determination is based on the absence of significant adverse effects on natural or cultural resources and the project's expected benefits to traffic flow, public safety, and stream conveyance capacity.

1.2 PROJECT PURPOSE AND NEED

The purpose of the project is to replace the Four Mile Creek Bridge to safely accommodate two vehicle, bicycle, and pedestrian traffic lanes and improve traffic operations and safety. A traffic analysis conducted to address congestion on this section of Kilauea Avenue found the intersection at Haihai Street insufficient to control current and anticipated future traffic loads. The existing bridge can only accommodate one car at a time; and thus, creates a buildup of traffic in both directions on Kilauea Avenue, affecting the nearby intersection of Kilauea Avenue and Haihai Street north of the bridge. The congestion disrupts daily life for the community, and the narrow bridge is a safety hazard for vehicle, bicycle, and pedestrian traffic.

Bridge inspections identified structural deterioration and load capacity deficiencies of the Four Mile Creek Bridge and concluded that many of the bridge features do not meet current safety standards and recommended bridge replacement and intersection improvements. The project will provide multimodal and safer transportation across the stream, allowing for pedestrians and bicyclists to use the public roadway in a safe manner. The project will also increase the width of Four Mile Creek below the bridge to increase water conveyance under the bridge.

The planned road improvements and widened bridge will complement and tie into HDOT's and DPW's *Safe Routes to Waiakea Schools - Kilauea Avenue* Program Project (further details available in Section 2.3.2). By addressing congestion and improving safety and multimodal access, the project fulfills objectives included in the Hawaii State Plan, the Federal Aid Highways 2035 Transportation Plan for the

District of Hawaii, the Hawaii 2050 Sustainability Plan, and the Hawaii Statewide Transportation Plan 2045 to enhance safety and improve accessibility (see Section 3 for further discussion).

1.3 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

This Draft Environmental Assessment (EA) has been prepared pursuant to requirements of HRS Chapter 343, as amended, and HAR Title 11, Chapter 200.1. Compliance with State of Hawaii Environmental Policy Act (HEPA) is triggered because of the use of State and County lands and funds and the proposed use of land within the State's Conservation Land Use District. This Draft EA analyzes the potential environmental impacts of the Proposed Action and considered alternatives, including a No Action Alternative. This Draft EA is intended to provide sufficient information to determine whether the project is likely to significantly affect the environment, which would trigger the requirement to prepare an environmental impact statement (EIS).

1.4 PROJECT LOCATION AND AREA

The project is located approximately 0.4 miles north of Hawaii Belt Road (Highway 11) on the south side of Hilo, Hawaii at 19°40'26" N, 155°03'59" W (Figure 1). Four Mile Creek Bridge carries Kilauea Avenue over Four Mile Creek (also called Kaahakini Stream). This section of Kilauea Avenue transitions from developed land with single-family homes to rural agricultural land. The stretch of creek in the vicinity of the project site is heavily vegetated with non-native species and the residential areas within the project area have cultivated landscaping.

The project area occupies approximately 9.2 acres, as shown on the Site Map (Figure 1). The bridge, road, and intersection areas are approximately 4.2 acres. Five acres of the currently unused Panaewa Farm Lots (TMK 2-2-048:001), owned by the State and located approximately 1,000 feet southeast of the existing bridge, are proposed as a temporary construction staging area (Figure 1).

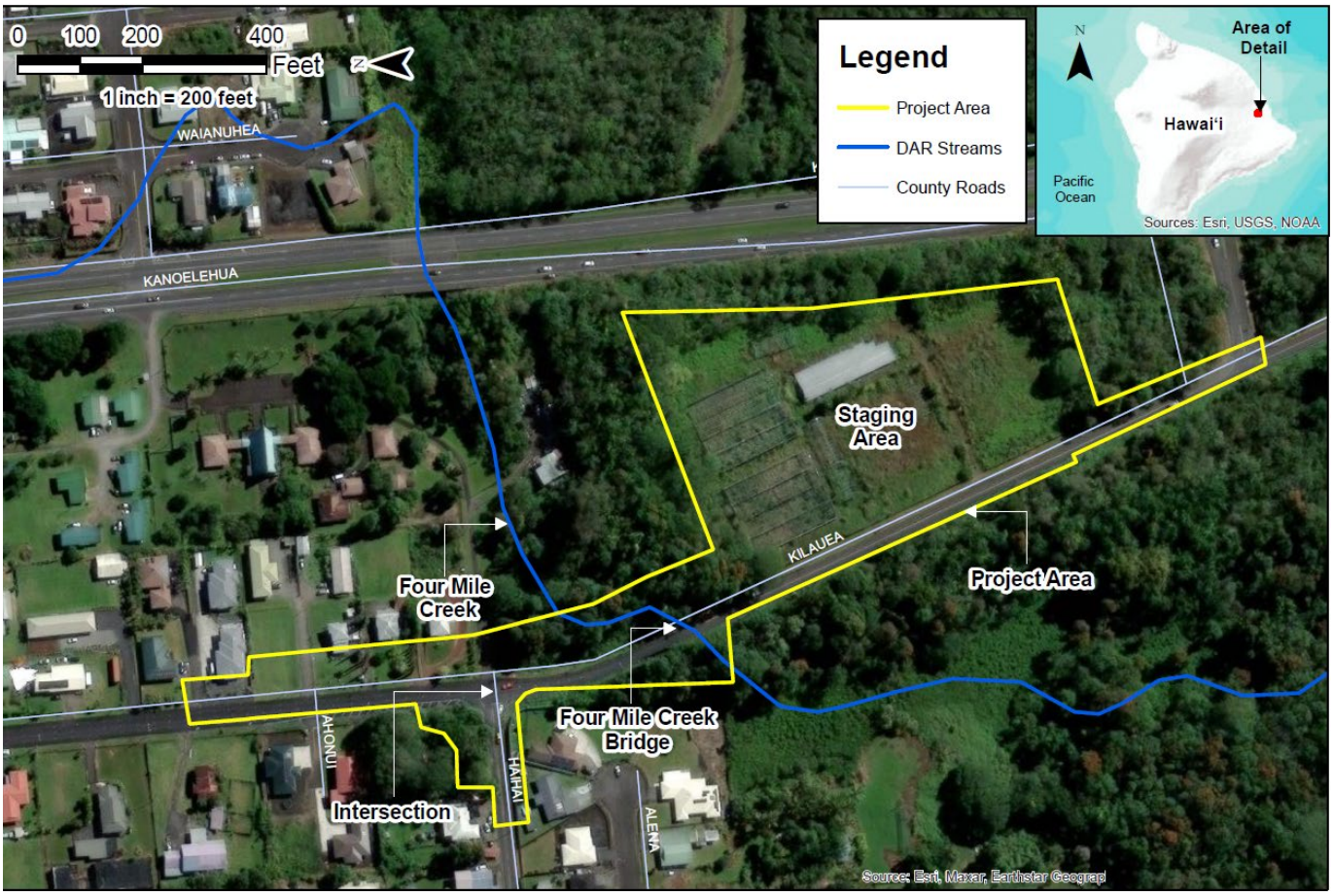

Figure 1: Project Area Map

1.5 SURROUNDING LAND USE

Most construction activities will occur within the current County right-of-way (ROW) at the existing bridge, the Kilauea Avenue – Haihai Street intersection, and bridge approaches. The project area is developed, with the land used for single-family residential properties and agriculture. Vegetation in the stream channel is overgrown. The proposed construction staging area is anticipated to be located at Panaewa Farm Lots, which are State-owned lands not currently in agricultural production. Additional information about land use designations, property acquisition, and supporting figures are provided in Section 2.1.2.

1.6 PROPOSED ACTION AND ALTERNATIVES

1.6.1 Alternative A: Proposed Action

The Proposed Action is to replace Four Mile Creek Bridge with a widened single-span concrete girder bridge, make roadway and pedestrian facility improvements along the adjacent segments of Kilauea Avenue and signalize the intersection of Kilauea Avenue and Haihai Street.

The existing bridge and superstructure will be removed entirely and replaced with a single-span concrete girder bridge more than three times wide and more than twice as long. The widened bridge will accommodate north- and south-bound through lanes, one left turn lane (westbound onto Haihai

Street), bike lanes/shoulders, raised sidewalks, and buffers on both sides of the road. At the Kilauea Avenue and Haihai Street intersection, a traffic signal will be installed, the east side of the intersection will be widened to accommodate the addition of northbound and westbound left turn lanes, and ADA-accessible curb ramps will be installed. Figure 2 shows the preliminary layout for the Proposed Action.

The stream beneath the bridge will be widened to its historical shape prior to construction of the existing Four Mile Creek Bridge. The distance between the north and south bridge abutments will be widened by 55 feet. To accommodate the stream widening below the bridge, the bridge length will be more than doubled to 125 feet. The new abutments will be placed outside of stream and the widened stream channel. The section of the embankment between the old and new abutments will be excavated to the grade of the existing channel. Geotechnical borings found that the north embankment in this area consists entirely of fill and not naturally deposited soil; therefore, the removal of the fill will restore the stream to approximately its historical width. Riprap around the constructed north and south abutments and along the banks of the stream will be installed to protect the new abutments from water scour.

To widen the bridge, the County would need to acquire approximately 1.2 acres (0.9 acres owned by the State and 0.3 acres owned by private residents) of adjacent land east of the bridge and Kilauea Avenue south of the bridge (Figure 3).

Kilauea Avenue will be widened along the makai (east) side to accommodate the addition of a turn lane to provide safer access to Haihai Street just north of the bridge. At the south end of the project, Kilauea Avenue will taper from three lanes at the bridge to the width of the existing two-lane roadway approximately 350 feet south of the bridge. At the north end of the project, Kilauea Avenue will taper back to the width of the existing two-lane roadway approximately 350 feet north of the bridge.

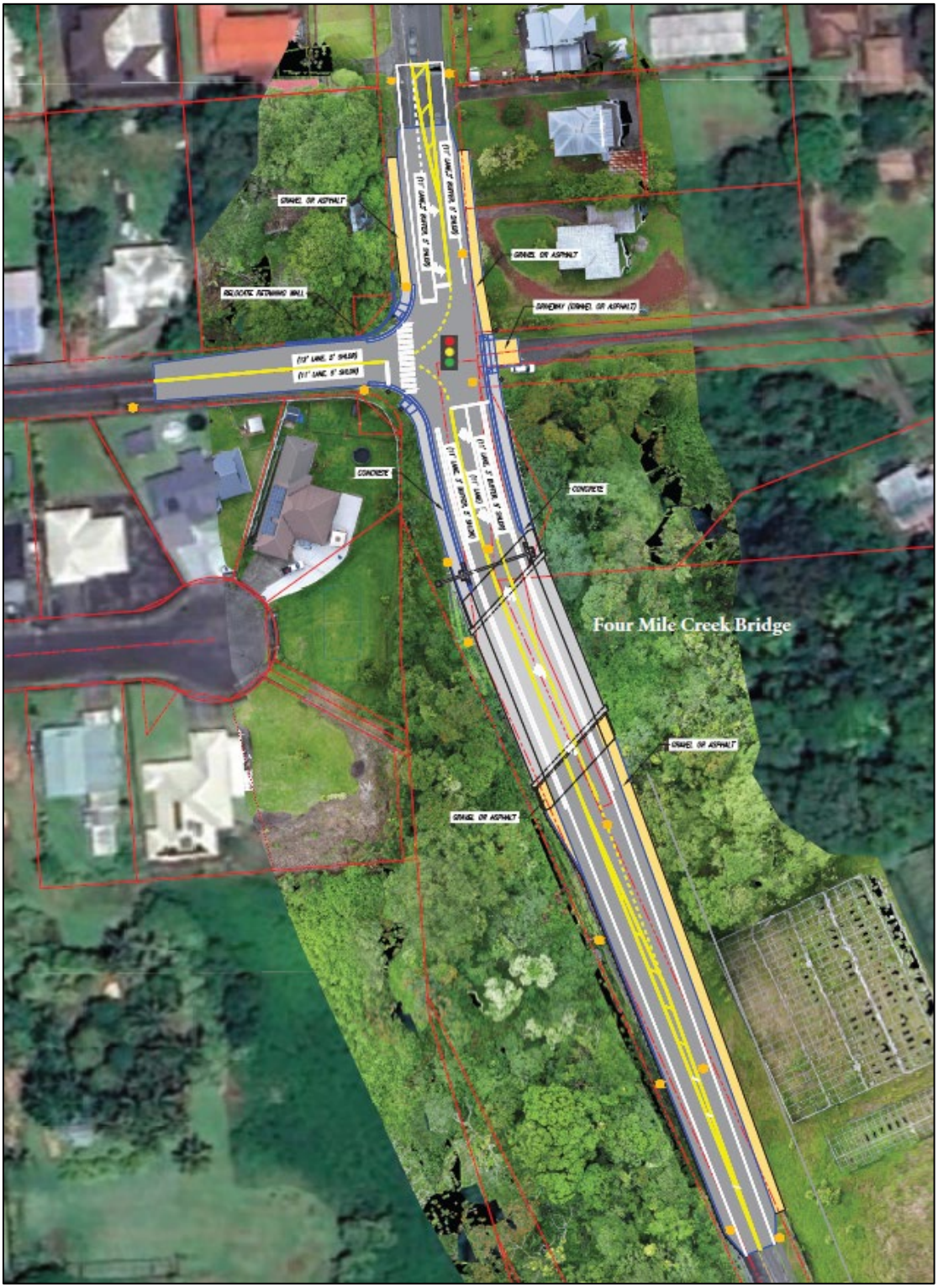

Figure 2: Schematic of the Proposed Action: Bridge Replacement and Widening with a Traffic Signal at the Kilauea Avenue and Haihai Street Intersection

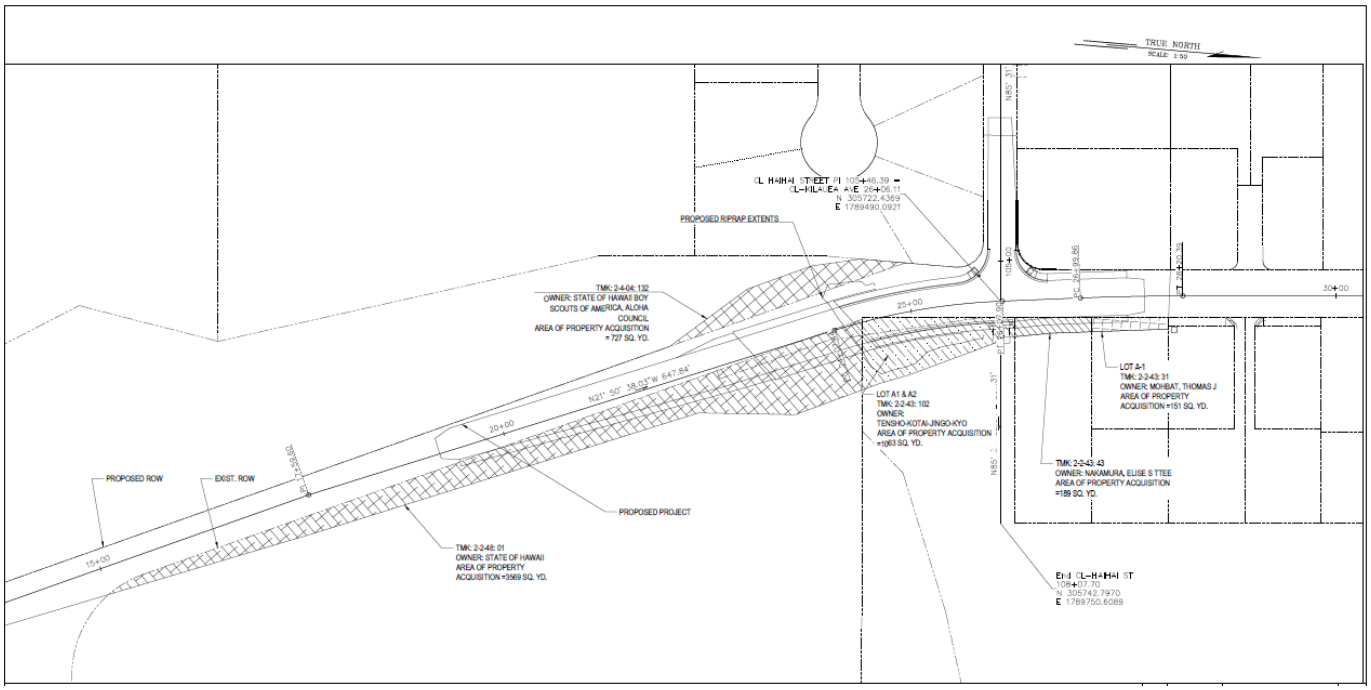

Figure 3: Proposed Action Property Acquisition (shaded area) Needed for Bridge Widening

The intersection at Haihai Street will be signalized and pedestrian safety improvements added. ADA-accessible curb ramps will be installed at the signalized intersection. The curb ramps will connect to a sidewalk system that is planned to be developed as part of the County's *Safe Route to Waiakea Schools* project (see Section 2.3.2). To accommodate the curb ramps and sidewalks, the retaining wall at the northwest corner of the intersection will be demolished and reconstructed at the back of the property line, approximately 5 feet behind its current position. Figure 4 shows details of the intersection layout.

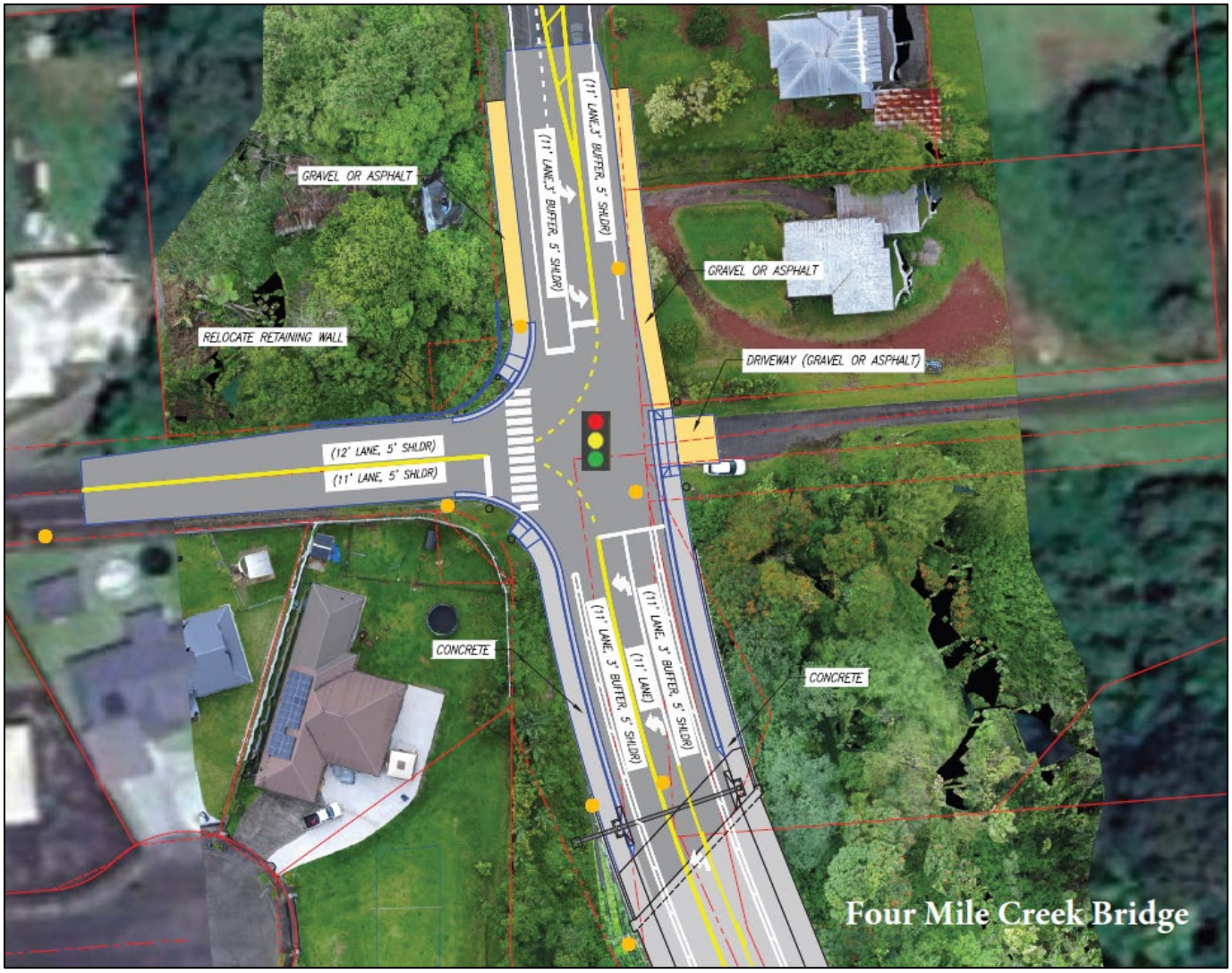

Figure 4: Proposed Action New Intersection with Added Stoplight

1.6.2 Alternative B: Alternative to the Proposed Action

Although the main goal of the project is to replace the bridge, DPW evaluated the feasibility of installing a roundabout at the Kilauea Avenue and Haihai Street intersection when evaluating associated intersection improvements. A Traffic Impact Analysis Report conducted for the project found that both a traffic light and roundabout would improve the flow of traffic flow through the Kilauea Avenue – Haihai Street intersection, with slightly better results for the roundabout (Appendix A). However, turn radius requirements and geographic constraints make a roundabout impractical as considerable areas of property, including one to three houses north of the roundabout, would need to be acquired (Figure 5). Therefore, a roundabout was removed from further consideration as an alternative.

Figure 5: Schematic of Alternative B to the Proposed Action – New Roundabout at the Kilauea Avenue and Haihai Street Intersection

1.6.3 No Action Alternative

Under the No Action Alternative, the bridge structure would remain in place, northbound traffic would continue to yield to southbound traffic (and vice versa) at the narrow bridge, and the intersection of Kilauea Avenue and Haihai Street would continue to experience vehicle and pedestrian traffic safety issues. In addition, traffic issues would be exacerbated by predicted population growth in the area and increased road usage. The bridge structure does not meet current safety design requirements; thus, the

No Action Alternative carries potential risk to human safety. Finally, the current bridge structure is vulnerable to flooding and would continue to negatively impact traffic and safety.

1.7 ANTICIPATED PROJECT SCHEDULE AND COST

Construction is expected to take approximately two years to complete. The start of construction will depend on permitting approvals, the project design timeline, and agency consultations, and is tentatively planned start in the winter of 2026.

Based on preliminary design concepts, costs for the Proposed Alternative are estimated to be $18 million. The project will be funded by a $6 million County appropriation and an added $12 million from the State (Big Island Video News, 2021).

1.8 PERMITS AND APPROVALS SUMMARY

Below is a list of permits and approvals that may be required for the Proposed Action. Section 3 includes more detailed discussion of regulations, policies, and plans.

1.8.1 Federal

- Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES) Permit (authority delegated to HDOH)

1.8.2 State

- Hawaii Environmental Policy Act (HEPA)
- Conservation District Use Permit (CDUP)
- Stream Channel Alteration Permit (SCAP)
- Community Noise Permit
- Disability and Communication Access Board Review and Approval
- Clean Air Branch Permit
- ROW Acquisition Approval from Division of Land and Natural Resources (DLNR) Land Division

1.8.3 County of Hawaii

- Grading, Grubbing, and Stockpiling Permits
- Building Permit
- Flood Development Permit
- ROW Acquisition Approval for Private Properties

2. Affected Environment, Potential Impacts, and Proposed Mitigation

This section describes the existing conditions of the project area, potential impacts of the project, and proposed measures to avoid, minimize, or mitigate those potential effects, as well as the impacts that will remain. Each section focuses on an environmental or social discipline that is potentially affected by the Proposed Action.

2.1 PHYSICAL AND NATURAL ENVIRONMENT

2.1.1 Climate and Climate Change

2.1.1.1 Existing Conditions

2.1.1.1.1 Climate

The climate on the east side of Hawaii Island is tropical and dominated by northeast trade winds that bring warm, moisture-laden air for approximately 70 percent of the year. The mean yearly temperature in Hilo is about 72 degrees Fahrenheit. The average temperature of hottest summer months (July through September) is 75 degrees Fahrenheit, and the average temperature of the winter months (November through February) is 69.5 degrees Fahrenheit (Giambelluca et al., 2013, 2014). Annual rainfall in Hilo is approximately 145 inches per year (Giambelluca et al., 2013, 2014). The dry season is typically May to October and characterized by northeast winds and sun. The wet season is typically October to May and characterized by cooler temperatures, cloud cover and rain, and variable winds.

Four Mile Creek is influenced by flood events in the Waiakea and Palai Streams to the north. Historically, these streams have not adequately contained flood water flows, as evidenced by major flood damages that occurred in February 1979, March 1980, August 1994, November 2000, and February 2008. During the November 2000 flood, residents along Awapuhi Street were stranded by floodwaters and required rescue by firefighters. In February 2008, almost 11 inches of rain fell in a 24-hour period, resulting in approximately 150 homes being damaged by floodwaters rising to 4 feet in depth in Hilo (United States Army Corps of Engineers [USACE], 2020).

2.1.1.1.2 Climate Change and Natural Hazards

Climate change is and will continue to be felt in Hawaii through three main impacts: rising sea level, rising temperatures, and less overall rainfall but more intense storms. Although the project area does not fall within the projected 3.2-foot sea level rise exposure area (Pacific Islands Ocean Observing System, 2024) at Hilo Bay, other climate impacts may affect the site.

Hawaii has had increasing consecutive days of extremely heavy rainfall, which causes increased runoff, erosion, and flooding (State of Hawaii, 2024). The existing bridge falls within the 100-year flood zone and within a regulatory floodway (Federal Emergency Management Agency [FEMA], 2024). With increases in precipitation intensity and frequency anticipated due to climate change, a 100-year flood has the potential to occur more frequently (State of Hawaii, 2024). In 2021, HDOT Highways released its Climate Adaptation Action Plan which focuses on potential risks and impacts to state roads and bridges from severe weather hazards, including floods, and actions for addressing and mitigating these risk and impacts (State of Hawaii, 2021; see Section 3.2.9).

Greenhouse gases (GHGs; carbon dioxide [CO_2], methane, nitrous oxide, and fluorinated gases) trap heat in the earth's atmosphere. In the context of climate and ocean warming, increases in levels of

atmospheric GHGs have been attributed to human activity (Intergovernmental Panel on Climate Change, 2023). In 2019, the total GHG emissions in Hawaii was equivalent to 22.01 million metric tons of CO_2. The largest contributor of GHGs in Hawaii was the energy sector (including fossil fuel burning to produce electricity, transportation, waste incineration, and natural gas systems) which is the source of 88.4 percent of GHG emissions (HDOH, 2021). According to the Federal Highway Administration (FHWA), HDOT and Metropolitan Planning Organizations are key for implementing activities to reduce transportation-related GHG emissions, including on-road emissions from vehicles (United States Government Accountability Office, 2023).

2.1.1.2 Potential Impacts and Proposed Mitigation Measures

2.1.1.2.1 Proposed Action

Under the Proposed Action, no adverse long-term impacts to climate are expected to occur. Although construction equipment would provide a temporary increase in GHG emissions, the levels are negligible compared to traffic in the area.

Benefits from the proposed project include decreased traffic congestion and decreased GHG emissions produced by idling. The new bridge and roadway configuration also provides safer options for pedestrian and bicycle transportation that do not burn fossil fuels, and the project will tie into the *Safe Route to Waiakea Schools – Kilauea Avenue* project (SRTS) intended to improve multimodal infrastructure and connectivity in the larger Hilo area. The Proposed Action would also increase resilience to climate-induced flood events by improving the structural integrity of the bridge and improving the stream conveyance below the bridge.

The contractor will be required to use equipment with appropriate emissions controls to mitigate the temporary indirect impact of GHG emissions from equipment. No other adverse direct, indirect, or cumulative impacts related to climate are identified, and no other mitigation is proposed.

2.1.1.2.2 No Action

Under the No Action Alternative, adverse indirect impacts to and from climate may occur. The bridge is used by approximately 11,000 vehicles per day to connect Kilauea Avenue with Highway 11, and being one-lane, slows down traffic to both north and south approaches. The No Action Alternative would continue to slow traffic, contributing to higher emissions of GHGs by idling cars, and does not offer alternative pedestrian and bicycle routes. A 2019 analysis found that the existing bridge is vulnerable to flooding during a 100-year storm event (DPW, 2019). Anticipated increased storm intensity may increase the frequency of flooding if the bridge is left in its current condition.

2.1.2 Land Use

2.1.2.1 Existing Conditions

Hawaii's land use regulation is broken down into State-level and County-level land use laws. The State Land Use Law (HRS § 205) classifies land use management into four districts: Urban, Rural, Agricultural, and Conservation. The project area is partially located in the Conservation State Land Use District (SLUD) and partially within the Urban SLUD (State of Hawaii, 2022). Figure 6 identifies the project area boundary and the Conservation (General Use Subzone) and Urban SLUD zones.

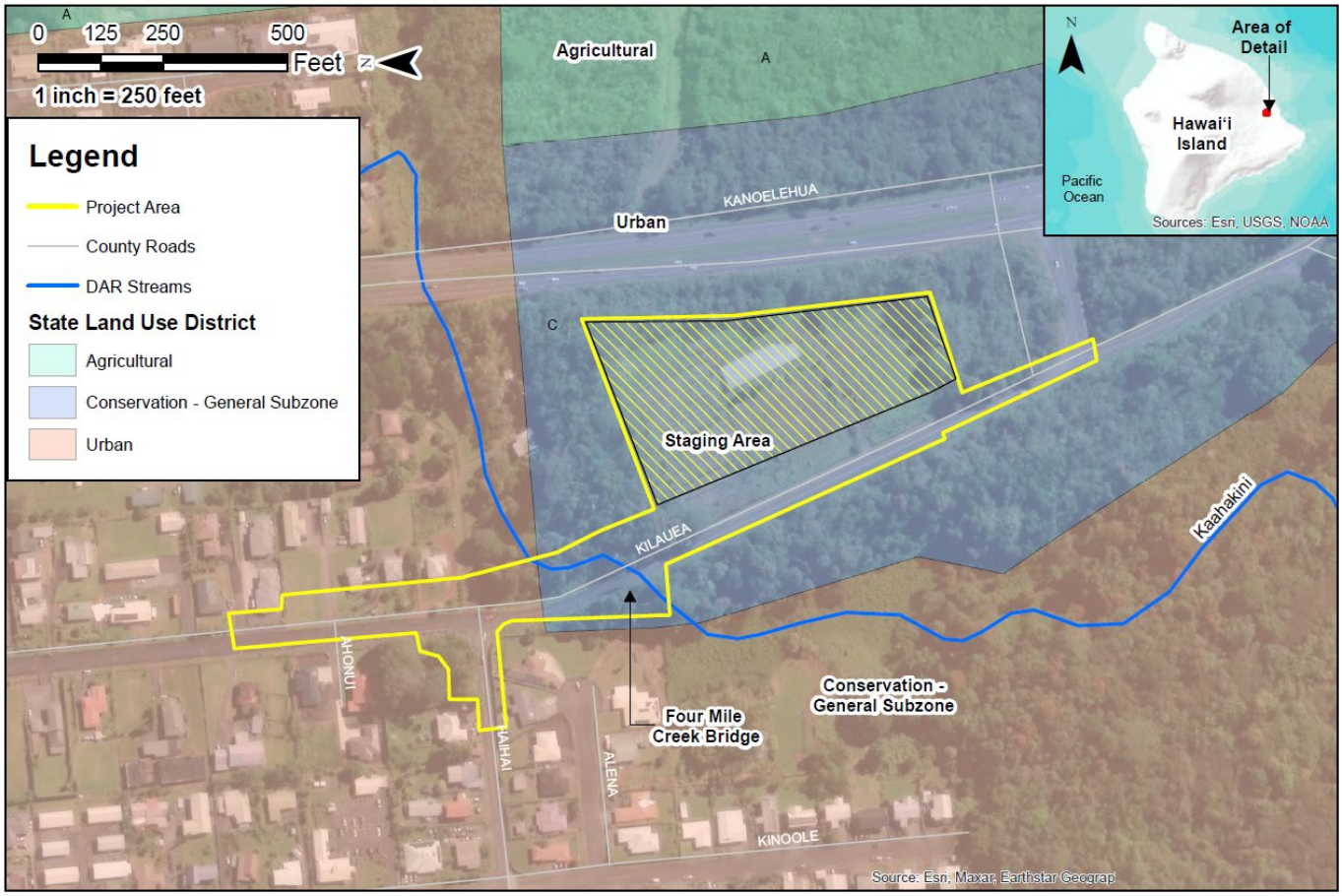

Figure 6: State Zoning Designations of the Project Area

The Conservation District falls under the jurisdiction of the DLNR Office of Conservation and Coastal Lands (OCCL). The Conservation District is divided into four subzones: Protective, Limited, Resource, and General. The project area is partially located in the Conservation-General subzone, the least sensitive of the conservation subzones. The purpose of the general subzone is to "designate open space where specific conservation uses may not be defined but where urban use would be premature" (DLNR, 2011). Road construction is an allowed use in the Conservation District but requires a CDUP and approval from the Board of Land and Natural Resources (BLNR). Land use within the State Conservation District is regulated under HAR Title 13, Chapter 5, and HRS Chapter 183C. These regulations govern allowable land uses, establish permitting processes for discretionary activities, and provide enforcement mechanisms, including fines for unauthorized actions.

Urban district land use falls under the County's jurisdiction and is controlled by County zoning. Figure 7 indicates the project area's urban zoning designations, which are:

- OPEN – Open District;
- A-10a – Agricultural District (minimum building site of 10 acres);
- A-1a – Agricultural District (minimum building site of 1 acre); and
- RS-10 – Single-Family Residential District (minimum building site of 10,000 square feet) (County of Hawaii, 2017).

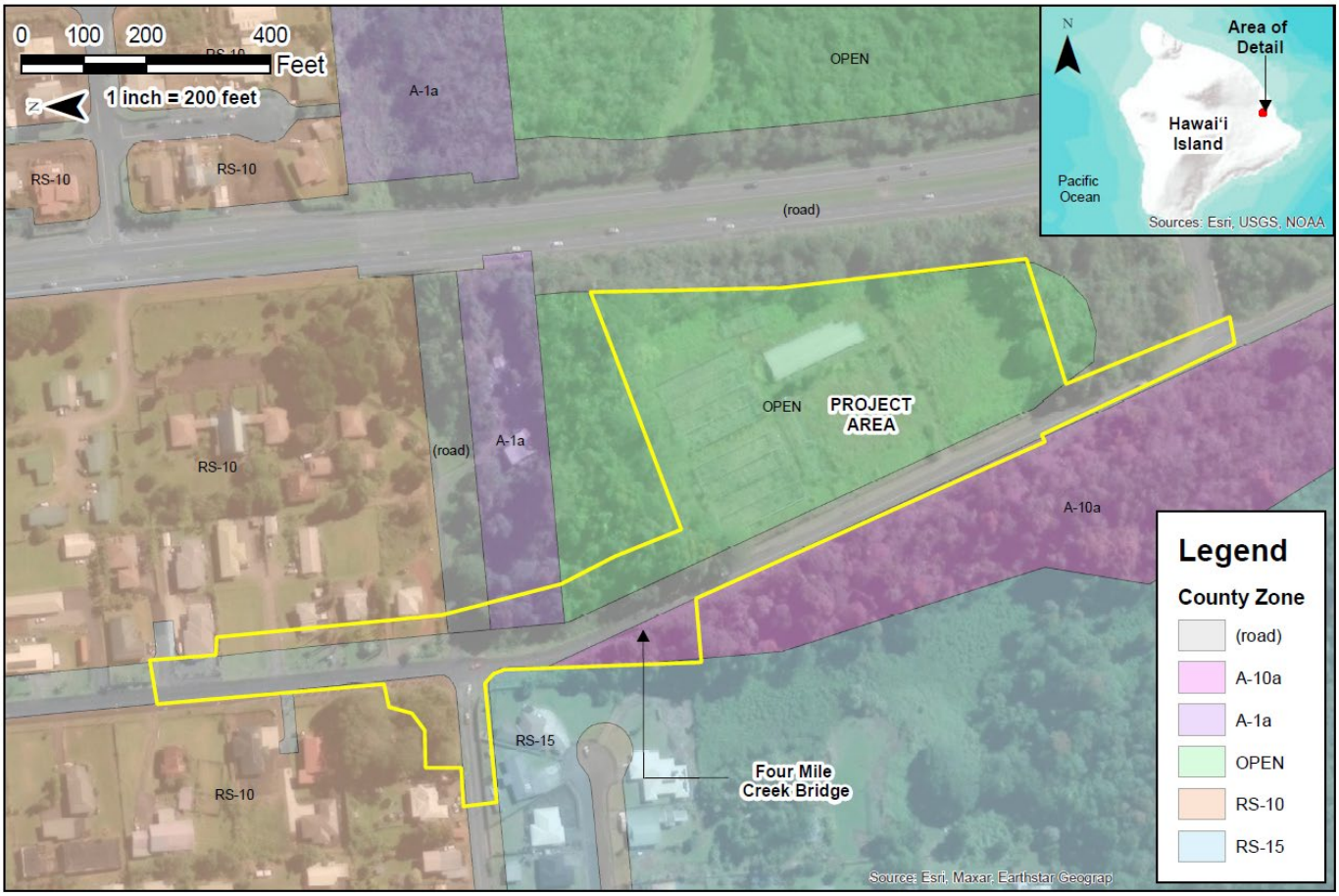

Figure 7: County Zoning Designations of the Project Area

Landowners within the project area include eight private homeowners and the State. One of the State-owned properties is leased by the Boy Scouts of America's Aloha Council, and the other is the Panaewa Farm Lots, proposed for use as a construction staging area. Preconsultation has taken place with affected landowners and lessees, as detailed in Section 4.

Another County transportation project is planned to connect to the north end of the Four Mile Creek Bridge replacement project. The SRTS project will add sidewalks and bike lanes and improve striping along 1.5 miles of Kilauea Avenue between the intersection with Puainako Street and the intersection with Haihai Street. The SRTS project will not require land acquisition or change land use of the area, but it will provide safer and more transportation options to walk, bike, and utilize other commuting modes in and around the area.

2.1.2.2 Potential Impacts and Proposed Mitigation Measures

2.1.2.2.1 Proposed Action

Under the Proposed Action Alternative, no adverse impacts to Urban or Conservation Land Use Districts and their respective subzones are anticipated. 6.18 acres of permanent and temporary uses are proposed to take place in the Conservation Area. Five acres of Conservation Land will be used for temporary staging and storage area during construction (Attachment B; Figure 1). To expand the bridge, 0.87 acres of Conservation Land and an additional 0.31 acres of property adjacent to Kilauea Avenue,

not within the Conservation Area, will need to be permanently acquired by the County as part of the County ROW . This action is allowed as a "Public Purpose Use" under HAR Title 13, Chapter 5. The land is part of TMK 2-2-048:001, which is owned by the State and administered by the Department of Hawaiian Home Lands. Land acquisition negotiations with the State DLNR Land Division are underway.

The temporary and permanent use of Conservation Land requires a Board-level CDUP and approval from the BLNR. Preparation of the CDUP application is underway. The CDUP will verify that all proposed activities within the Conservation District are reviewed and authorized in compliance with applicable state requirements. No mitigation measures are required.

2.1.2.2.2 No Action

Under the No Action Alternative, no changes would be made to land use. No impacts, beneficial or adverse, to Urban and Conservation Land Use Districts and Subzones are expected.

2.1.3 Hydrology

2.1.3.1 Existing Conditions

Four Mile Creek is one of five tributaries within the Wailoa River system, a watershed approximately 100 square miles in size (Parham et al., 2008). The Wailoa River System and its hydrology is monitored by United States Geological Survey (USGS 16701400; USGS, 2023); however, Four Mile Creek does not have any stream gauges. Makai (east) of the project area, the stream is channelized and referred to as the Kaahakini Flood Channel.

Four Mile Creek originates down slope of the broad saddle formed between the volcanoes Mauna Kea (elevation 13,803 feet above mean sea level [AMSL]) and Mauna Loa (13,679 feet AMSL). The creek's basin has a drainage area of approximately 7 square miles and drains to undeveloped land and an old quarry south of the airport and east of Railroad Avenue. This basin extends through the Waiakea Forest Reserve with elevations ranging from sea level to 2,100 feet. Below 1,500 feet elevation, the basin is largely developed or planned for commercial, residential, and agricultural development. Four Mile Creek is intermittent and dry during most of the year. Stream patterns throughout many reaches above 500 feet in elevation are indefinite and not discernable (USACE, 2019). The creek flows away from Hilo through an unlined Kaahakini flood control channel that was constructed by the County. This 10,000-foot-long flood channel starts east of the project area, beginning at the bridge spanning Highway 11, and flows through open land with scattered pockets of residential and farmland use before emptying into undeveloped land and an old quarry. Four Mile Creek is susceptible to flash flood events resulting in peak discharges occurring soon after heavy rainfall events. The flood channel has waterflow only during flash flood and heavy rain events.

Figure 8 provides the FEMA flood map for the project area. The FEMA flood map shows the portions of the project area fall into the following flood zones:

- Regulatory floodway;
- Zone AE – special flood hazard area with base flood elevation; and
- Zone X – areas of 0.2 percent annual chance flood hazard or areas of 1 percent annual chance flood with average depth of less than 1 foot or with drainage areas of less than 1 square mile (FEMA, 2024).

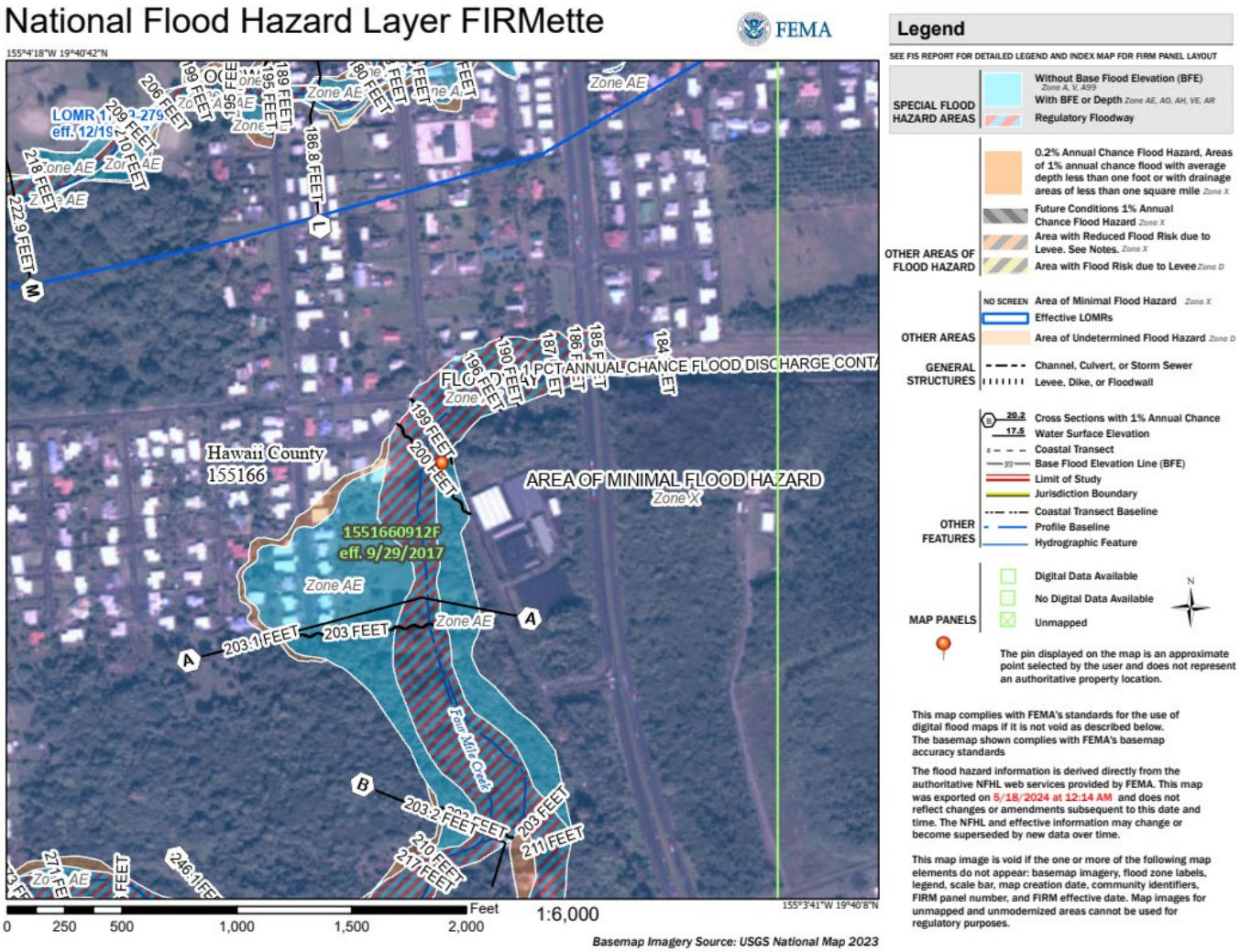

Figure 8: FEMA Flood Hazard Map for Four Mile Creek, Hilo, HI (FEMA, 2024)

2.1.3.2 Potential Impacts and Proposed Mitigation Measures

2.1.3.2.1 Proposed Action

Under the Proposed Action Alternative, no adverse impacts to hydrology are expected. The new configuration will lessen the likelihood of flooding, providing a beneficial impact related to hydrology. The existing bridge superstructure will be removed entirely, and the existing substructure will be removed down to the stream bed. Raising and widening the roadway will result in the stream width beneath the bridge being more than doubled, increasing stream conveyance under the bridge. The new bridge abutments will be placed outside of the widened stream channel, and no obstructions to flow will be placed in the stream. Riprap installed along the stream banks to protect the abutments will not be placed in a location or manner that will impair surface water flow.

2.1.3.2.2 No Action

Under the No Action Alternative, no beneficial impact on hydrology is expected. However, an ongoing adverse impact would continue, i.e., the existing bridge is expected to overtop during a 100-year flood event. This could contribute to infrastructure damage and safety risk to drivers.

2.1.4 Wetland and Freshwater Resources

2.1.4.1 Existing Condition

The section of Four Mile Creek Stream that passes through the project area is dry for most of the year and only carries water during heavy precipitation events. The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory classifies the portion of the stream as a riverine, intermittent, streambed, seasonally flooded wetland (R4SBC). Downstream and east of the project area (Figure 9), the stream becomes an unlined flood channel that is classified as a riverine, unknown perennial stream with an unconsolidated bottom that is permanently flooded (R5UBH; USFWS, 2024).

A USACE March 2021 Feasibility Report and Environmental Assessment describes the Four Mile Creek Unlined Flood Control Channel as Non-Federal waters (USACE, 2021). The report describes Four Mile Creek as intermittent and dry during most of the year. The 10,000-foot-long flood control channel begins at the Kanoelehua Street (Highway 11) Bridge and drains into undeveloped lowlands and an old quarry near the Hilo Drag Strip, south of Hilo International Airport. This channel does not reach the ocean (Harada, 2023). These factors indicate that Four Mile Creek does not meet the definition of Waters of the Unites States (WotUS) under the "Revised Definition of 'Waters of the United States'" (United States Environmental Protection Agency [EPA], 2023); and therefore, does not fall under the USACE's jurisdiction. An approved jurisdictional determination was received from the USACE Honolulu District Regulatory Office on March 4, 2026, which stated that Four Mile Creek does not meet the definition of WotUS.

The Four Mile Creek is not included in the 2024 Section 303(d) list of impaired waters so the surface water quality standards for human safety have not been assessed (HDOH, 2018). Surface water quality in the proposed project area may be influenced by agricultural practices as well as residential, commercial, and industrial development, though no data exist at this time.

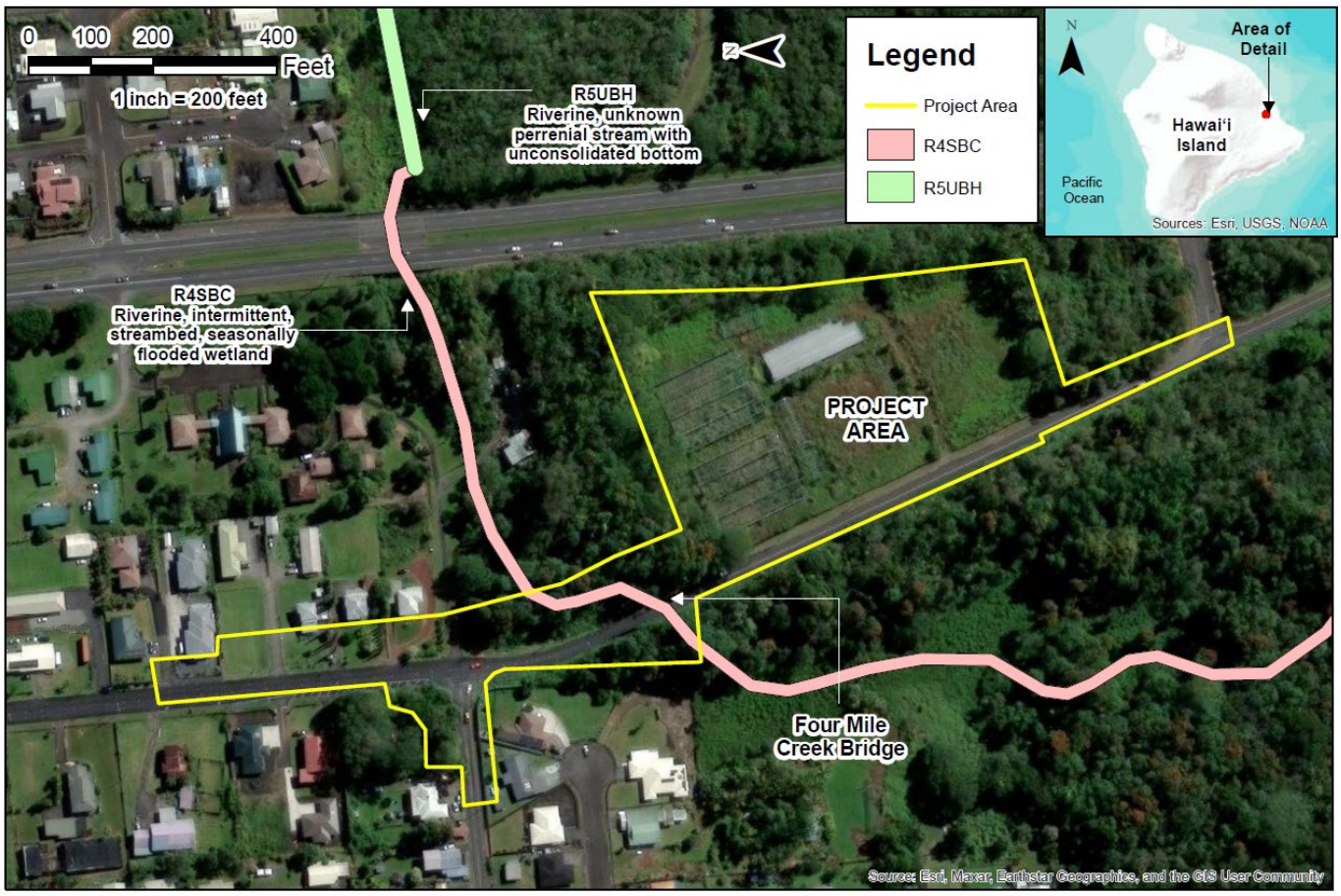

Figure 9: National Wetland Index Classifications of Four Mile Creek Project Area

2.1.4.2 Potential Impacts and Proposed Mitigation Measures

2.1.4.2.1 Proposed Action

Under the Proposed Action Alternative, Four Mile Creek will be widened to closer to its historical channel width. There is potential for short-term adverse direct impacts to water quality during demolition of the existing bridge and construction of the new bridge, as well as road construction adjacent to the waterway. Best management practices (BMPs) will be implemented to mitigate construction-related impacts to water quality, and in-stream construction work will be conducted during dry conditions, to the extent practicable. No significant long-term impacts to wetlands and freshwater resources are expected.

2.1.4.2.2 No Action

Under the No Action Alternative, no ground disturbing activities and no disruption to the existing environment will occur, resulting in no adverse or beneficial impacts.

2.1.5 Geology and Soils

2.1.5.1 Existing Conditions

The underlying geology of the proposed project area resulted from the lava flows of the Mauna Loa Volcano. Mauna Loa is the largest active volcano on Earth, which last erupted in 2022. The region of the

proposed project has Kau Basalt lava flows deposited 200 to 1,500 years ago. The project area is characterized by volcanic rock close to the surface creating a hard surface layer that limits infiltration in some locations. Lava tubes in the area may route water underground where it reappears elsewhere as springs or seeps (USGS, 2023). The USGS has mapped potential lava flow inundation zones. The project area is in lava flow hazard zone 3, which is defined as an area where 1 to 5 percent of the area has been covered with lava since 1800, and 15 to 75 percent of the area has been covered within the last 750 years (Wright et al., 1992).

Earthquakes associated with volcanic activity occur thousands of times annually; most earthquakes are of very small magnitude. Hilo and the proposed project area are in areas that are classified as zones D_1 and D_2 in the seismic design code. These zones have a 2 percent chance of peak ground acceleration to exceed 67 and 83 percent of the acceleration of gravity, respectively, in 50 years (USGS, 2019).

Four Mile Creek Basin lies on top of basaltic aa and pahoehoe lava flows of the Kau Volcanic Series extruded from Mauna Loa (Macdonald et al., 1983). Volcanism is the primary driver of change in geologic resources. Due to the unpredictability of volcanic eruptions, it is impossible to predict whether the proposed project would be impacted by volcanic activity in the next 50 years. Based on Soil Survey of the Island of Hawaii (Sato et al., 1973), the bedrock of pahoehoe lava underlays most of the Four Mile Creek Basin. The bedrock combination of ‘aa and pahoehoe lava is found below 500 feet elevation of the Palai Basin. Four Mile Creek Basin drains into undeveloped lowlands and an old quarry east of the project area.

The soils in the staging area and southern half of the soil map are classified as “Papai extremely cobbly highly decomposed plant material, 2 to 10% slopes.” These soils are derived from ‘a‘a lava flows and are classified as well-drained soils with low runoff. They make up approximately 75 percent of the project area. North of Four Mile Creek, the soils are classified as “Panaewa very cobbly hydrous loam, 2 to 10% slopes.” These soils are derived from volcanic ash over pahoehoe lava flows and are characterized by moderately well drained soils with high runoff. They make up approximately 7 percent of the project area. The soils at the northern end of the project area, north of the Kīlauea Avenue and Haihai Street intersection, are “Panaewa-Urban land complex soils, 2 to 10% slopes.” These soils are also derived from basic volcanic ash over pahoehoe lava and are characterized by moderately well drained soils with high runoff. They make up approximately 18 percent of the project area. None of these soils are considered to be hydric soils (United States Department of Agriculture [USDA] National Resource Conservation Service [NRCS], 2024). Figure 10 shows the USDA NRCS soils map for the project area.

Geotechnical borings for preliminary design recommendations were done north and south of the bridge. Directly underlying the pavement at both borings was a well-graded gravel fill layer (i.e., Soil Unit 1), which appeared to be a crushed basalt rock material. Where penetrated, the thickness of the well-graded gravel layer ranged between 5 and 9 feet.

North of the bridge and underlying Soil Unit 1 was red-brown silty sand with gravel (i.e., Soil Unit 2). The density of this soil was very loose where sampled. Where penetrated, the thickness of the red silty sand was about 4.3 feet. This soil unit was not encountered on the south side of the bridge.

Basalt was encountered underlying Soil Unit 2 at about 13.3 feet in the northern boring, and underlying Soil Unit 1 at about 5 feet south of the bridge. At the northern boring, approximately 10.2 feet of rock core was collected between 13.33- to 23.5- foot depths below ground surface (bgs). At the southern boring, approximately 7 feet of rock core was collected between 5- to 12-foot depths bgs. At both the north and south borings, 1- to 2-foot-tall voids were encountered. These voids indicate that a lava tube

void likely exists south of the bridge approximately 20 feet below Kīlauea Avenue (Haley & Aldrich, Inc., 2025).

Figure 10: USDA NRCS Soil Map of the Project Area (source: USDA NRCS)

Table 1. USDA NRCS Soil Map of the Project Area

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
628	Papai extremely cobbly highly decomposed plant material, 2 to 10 percent slopes	6.9	75.4%
629	Panaewa very cobbly hydrous loam, 2 to 10 percent slopes	0.6	6.7%
638	Panaewa-Urban land complex, 2 to 10 percent slopes	1.6	17.9%
Totals for Area of Interest		9.2	100%

Source: USDA NRCS, 2024.

2.1.5.2 Potential Impacts and Proposed Mitigation Measures

2.1.5.2.1 Proposed Action

Under the Proposed Action Alternative, no adverse or beneficial impacts to geology or soils are expected. The north abutment will be moved approximately 40 feet north of the existing abutment, and the south abutment will be moved approximately 15 feet south of the existing abutment. The existing embankment between the old and new abutment locations consists mainly of fill above basalt rock and will be excavated down to the grade of the existing channel to increase the stream width beneath the bridge. Some amount of the fill removed during grading will be used to increase the elevation of the roadway approaches, and the rest will be disposed of in an appropriate location following County regulations.

2.1.5.2.2 No Action Alternative

Under the No Action Alternative, no adverse or beneficial impacts to geology or soils would be expected.

2.1.6 Noise

Noise is defined as any sound that is undesirable or interferes with normal human activities. The HDOH regulates noise per HAR §11-46, "Community Noise Control", which establishes maximum permissible sound levels for three Class zones. Refer to Table 2 for maximum permissible decibel (dBA) levels for each of the three zones. The project area falls within the Class A zoning district with a maximum permissible sound level of 55 dBA during the daytime (7 a.m. to 10 p.m.) and 45 dBA at nighttime (10 p.m. to 7 a.m.). Noise levels shall not exceed the maximum permissible sound levels for more than 10 percent of the time within any 20-minute period, except by permit or variance. HAR §11-46-7 grants the Director of the HDOH the authority to issue permits to operate a noise source which emits sound more than the maximum permissible levels specified in Table 2 if it is in the public interest and subject to any reasonable conditions. Those conditions can include requirements to employ the best available noise control technology.

Table 2: Maximum Permissible Sound Levels

Zoning Districts	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Class A (residential, conservation, public/open space)	55	45
Class B (apartments, business, commercial, resort)	60	50
Class C (agriculture, country, industrial)	70	70

Source: HAR §11-46, "Community Noise Control"

2.1.6.1 Existing Conditions

Ambient noise measurements have not been collected at the proposed project area. Construction activity noise levels can intermittently reach 80 dBA. Likely existing sources of noise include traffic on

the road and idling cars when traffic is backed up. Because the project area straddles residential and agricultural land uses, it is likely that the usual noise level is low.

2.1.6.2 Potential Impacts and Proposed Mitigation Measures

2.1.6.2.1 Proposed Action

Under the Proposed Action Alternative, construction activities are expected to cause temporary adverse noise impacts during construction (estimated to be approximately 24 months). Road improvements will involve roadway excavation and construction of an embankment, utility trenching and backfilling, concrete work, utility pole relocation, and roadway paving. Equipment for these actions will include jackhammers, saw cutters, backhoes, front loaders, dump trucks, generators, and compressors. The new bridge abutments will likely be cast in place, but some drilling will be necessary for the foundations. Pavement cutters, jackhammers, backhoes and earthmoving equipment like bulldozers and diesel-powered trucks will be the loudest equipment used during construction. An approved Community Noise Permit will be required for construction and use of certain construction and demolition (C&D) equipment. A variance to the Community Noise Permit may be required if the sound levels exceed 70 dBA, if hydraulic hammers (hoe rams) or pile drivers are used, or if the construction activity occurs on days and times other than Monday through Friday 7 a.m. to 6 p.m., and Saturdays 9 a.m. to 6 p.m.

FHWA provides typical noise levels for construction equipment, such as mobile cranes, bulldozers, excavators, and dump trucks. Noise levels for most equipment are expected to be between 80 and 90 dBA at 50 feet from equipment (FHWA, 2023). The closest residential dwelling is west of the proposed project area, approximately 80 feet from Kilauea Avenue. To mitigate the noise impacts, the contractor will be required to keep construction activities to weekdays between 8 a.m. and 5 p.m.

The SRTS project will also create construction noise that could cause noise impacts. Both projects will require Community Noise Permits. Efforts to stagger construction work near the Haihai Street intersection will be taken to minimize construction noise impacts in the area will be taken by the DPW, who will be implementing both projects. Construction is planned to be staggered, but there may be a small amount of concurrent work done towards the end of the Four Mile Creek Bridge replacement project and the beginning of the overlapping SRTS project phase. In that event, DPW will coordinate with the SRTS project to begin work from the Kawailani Street side of the project to minimize potential conflicts and noise.

2.1.6.2.2 No Action Alternative

Under the No Action Alternative, continued adverse impacts from idling vehicle noise are expected to occur.

2.1.7 Air Quality

2.1.7.1 Existing Conditions

The EPA has the primary responsibility for regulating air quality nationwide. The Clean Air Act (42 U.S.C. 7401 *et seq*.), as amended, requires the EPA to set National Ambient Air Quality Standards (AAQS) for seven major air pollutants: carbon monoxide (CO), nitrogen oxides, ozone (O_3), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), sulfur oxides, and lead. The State has also established its own standards for these pollutants. State and Federal AAQS are shown in Table 3. If the concentration of one or more criteria pollutants in a geographic area is found to exceed the regulated “threshold” level, the area may be classified as a non-attainment area. Areas with

concentrations of criteria pollutants that are below the levels established by the National AAQS are considered in attainment.

The State is an attainment area for CO, O_3, PM_{10}, and $PM_{2.5}$. The HDOH Clean Air Branch has 10 operating air quality monitoring stations on Hawaii Island. The closest stations to the project area are Station HILO and Station KS HAWAII. Both monitor sulfur dioxide (SO_2) and $PM_{2.5}$. There were four reported exceedances of SO_2 at the Hilo Station in 2023 due to volcanic emissions (i.e., vog). There were no exceedances in 2022 (HDOH, 2025).

Table 3: Federal and State Ambient Air Quality Standards

Air Pollutant	Interval	Hawaii Standard	Federal Primary Standard	Federal Secondary Standard
Carbon Monoxide	1-hour average	9 ppm	35 ppm	None
Carbon Monoxide	8-hour average	4.4 ppm	9 ppm	None
Lead	3-month average	1.5 µg/m^3 (calendar quarter)	0.15 µg/m^3 (running 3-month)	Same as primary
Nitrogen Dioxide	1-hour average	None	100 ppb	None
Nitrogen Dioxide	Annual average	0.04 ppm	53 ppb	Same as primary
Particulate Matter (PM_{10})	24-hour block average	150 µg/m^3	150 µg/m^3	Same as primary
Particulate Matter (PM_{10})	Annual average	50 µg/m^3	None	None
Particulate Matter ($PM_{2.5}$)	24-hour block average	None	35 µg/m^3	Same as primary
Particulate Matter ($PM_{2.5}$)	Annual average	None	12 µg/m^3	15 µg/m^3
Ozone	8-hour rolling average	0.08 ppm	0.070 ppm	Same as primary
Sulfur Dioxide	1-hour average	None	75 ppb	None
Sulfur Dioxide	3-hour block average	0.5 ppm	-	0.5 ppm
Sulfur Dioxide	24-hour block average	0.14 pm	None	-
Sulfur Dioxide	Annual average	0.03 ppm	None	-
Hydrogen Sulfide	1-hour average	25 ppb	None	None

Notes:

Source: HDOH, 2025

µg/m^3 = micrograms per cubic meter of air

ppb = parts per billion by volume

ppm = parts per million by volume

2.1.7.2 Potential Impacts and Proposed Mitigation Measures

2.1.7.2.1 Proposed Action

Under the Proposed Action Alternative, beneficial impacts to air quality are expected to occur post-construction, due to a reduction in traffic volume and idling time at the intersection and on the bridge. Additionally, the installation of pedestrian walkways and bicycle lanes allow for multimodal transportation methods that do not rely on fossil fuels. These actions support HDOH Clean Air Branch's standard recommendations for land use reviews.

Potential adverse impacts to air quality from construction equipment would be temporary and short-term. Air quality impacts from construction come from vehicle emissions from construction equipment, fugitive dust, or airborne particulate matter. During construction, the generation of airborne fugitive dust will be reasonably controlled and in compliance with HAR §60.1-33 on Fugitive Dust. Fugitive dust tends to come from construction vehicles operating on site and material blown from stockpiles, uncovered trucks, and exposed areas and can be mitigated by covering trucks and stockpiles, frequent watering of bare ground surfaces, and reestablishment of landscaping as soon as possible. BMPs such as implementing buffer zones to alleviate potential dust concerns, minimizing the amount of airborne, visible dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of least impact will be implemented during construction. Furthermore, BMPs will also include adequate water source to spray exposed soil areas, landscaping and

providing rapid covering of bare areas, including slopes, 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 area (HDOH Clean Air Branch [CAB] comments; Appendix D).

Demolition of a bridge older than 50 years carries the potential risk of disturbing asbestos-containing materials (ACMs), which may be present in components such as joint sealants, coatings, or deck materials commonly used in structures built before the 1980s. If ACMs are not properly identified and managed, their disturbance can release asbestos fibers into the air, posing risks to air quality and public health. Appropriate sampling and abatement actions in accordance with Federal and State regulations will be taken to identify and mitigate risk for ACMs, including coordination with the HDOH Indoor and Radiological Health Branch as required.

The existing bridge is not known or expected to have lead-based paint or otherwise contain lead. Should lead-containing paint or materials be discovered during demolition, appropriate sampling and removal actions in accordance with Federal and State regulations will be taken to identify and mitigate safety hazards and risk.

2.1.7.2.2 No Action Alternative

Under the No Action Alternative, continued adverse impacts to air quality are expected to occur. Population growth has contributed to the number of cars in the area, and traffic volumes have increased. The No Action Alternative status quo of a one-lane bridge will continue to cause traffic backups at the intersection, increasing idling times which negatively impact air quality (Appendix A).

2.2 BIOLOGICAL RESOURCES

2.2.1 Terrestrial Vegetation

2.2.1.1 Existing Conditions

A biological survey was performed of the project area and documented the dominance of introduced (non-native) species. A total of 117 plant species were documented during the survey with only two identified as native (indigenous) and seven identified as Polynesian introductions (Appendix B). No threatened or endangered plant species were identified. Two general vegetation types were encountered within the project area: 1) Cultivated Landscaping; and 2) Alien Wet Forest (Appendix B).

Cultivated landscaping vegetation was observed in residential lots in the northern section of the project area on both the east and west sides of Kīlauea Avenue. Dominant trees include mango (*Mangifera indica*), ulu (*Artocarpus altilis*), avocado (*Persea americana*), lychee (*Litchi chinensis*), and Guaiana chestnut (*Pachira aquatica*). These larger trees were mainly restricted to the property with the large retaining wall at the northwest corner of Kīlauea Avenue and Haihai Street. The understory was dominated by ferns such as Asian swordfern (Nephrolepis brownii), lauae haole (*Phlebodium aureum*), lauae (*Microsorum grossum*), and *Christella parasitica*. The native whisk fern Moa (*Psilotum nudum*) was observed infrequently growing epiphytically in trees. The vines *Vigna hosei* and maile pilau (*Padaeria foetida*) were also observed in the understory along with the Polynesian intoduced kī (*Cordyline fruticosa*). Across Kīlauea Avenue to the east, several residential lots are included in the project area. The strip of yard frontage that is included in the project area harbors landscaping plants such as money tree (*Dracaena marginata*), song of India (*D. reflexa*), cypress (*Cypress sp.*), croton (*Croton sp.*), and aloe (*Aloe sp*.).

The Alien Wet Forest vegetation type is found on the remainder of the project area. Roadsides, the Four Mile Creek drainage, and the Panaewa Farm Lot proposed for the laydown/staging area all harbor this weedy vegetation type. Larger trees documented include gunpowder tree (*Trema orientalis*), Octopus tree (*Heptapleurum actinophyllum*), Chinese banyan (*Ficus microcarpa*), African tulip (*Spathodea campanulata*), *Melochia umbellata*, Moluccan albizia (*Falcataria moluccana*), and autograph tree (*Clusia rosea*). Various other trees and palms include king palms (*Archontophoenix alexandrae*), bingabing *(Macaranga mappa*), and kukui (*Aleurites moluccana*). Thick stands of waiawī or strawberry guava (*Psidium cattleyanum*) were observed scattered in the forested areas as well as at the northwestern corner on private property. One hala (*Pandanus tectorius*), a native species, was observed outside of the project area on the western side of Kīlauea Avenue across from Panaewa Farm lots within the dense, secondary forest. In open areas along the roads and along forest edges, woody shrubs and grasses dominate the vegetation including, *Miconia crenata*, *Sphagneticola trilobata*, *Heterotis rotundifolia, Crotalaria spp.*, carpetgrass (*Axonopus compressus*), and Guinea grass (*Megathyrsus maximus*). A single plant of the indigenous pōpolo (*Solanum americanum*) was observed along the edge of the forested Four Mile Creek drainage.

The drainage area below the Four Mile Creek Bridge included dense vegetation of previously mentioned species as well as paca fern (*Diplazium esculentum*), mules-foot fern (*Angiopteris evecta*), yellow ginger (H*edychium flavecens*), angel‘s trumpet (*Brugmansia x candida*), ōhia ai or mountain apple (*Syzygium malaccense*), white shrimp plant (*Justicia betonica*), pink torch ginger (*Etlingera elatior*), maia or banana (*Musa x paradisiaca*), latispatha heliconia (*Heliconia latispatha*), Job‘s tears (*Coix lachryma-jobi*), ape (*Alocasia cucullata*), and night cestrum (*Cestrum nocturnum*). A full plant list can be found in Appendix B, Biological Survey.

2.2.1.2 Potential Impacts and Proposed Mitigation Measures

2.2.1.2.1 Proposed Action

Under the Proposed Action Alternative, construction will require removing vegetation and trees in the riparian area around Four Mile Creek and in the areas where road widening will occur. Because the tree stratum is predominantly comprised of invasive species, this is not considered an adverse impact. To prevent the introduction and control the spread of noxious plant species, all field equipment including tools, machinery, vehicles, as well as footwear and clothing, will be cleaned daily prior to and after field activities. Construction routes and equipment areas should be staged along existing roads, walkways, and gravel areas to minimize impacts to vegetation and to control erosion.

Native plants appropriate for current site conditions will be used for re-vegetation for the purposes of restoring areas temporarily disturbed by project work, including in staging areas where disturbance of vegetation is likely.

By incorporating the above mitigation measures, the project is unlikely to result in direct or indirect adverse impacts on sensitive plant species. Cumulative impacts are not expected from the SRTS project, which does not occur in the same forested area. No significant adverse impacts to native vegetation are expected to occur. If revegetation is required in the final project design, native species will be used.

2.2.1.2.2 No Action Alternative

Under the No Action Alternative, no beneficial or adverse impacts to vegetation would occur.

2.2.2 Terrestrial Fauna

2.2.2.1 Existing Conditions

Birds observed during the pedestrian survey and bird counts on June 11, 2024 were all non-native, introduced species. A total of nine non-native bird species were documented during the survey. The most prevalent birds seen and heard were the common myna (*Acridotheres tristis*), zebra dove (*Geopelia striata*), and red junglefowl (*Gallus gallus*). Cattle egret (*Bubulcus ibis*), warbling white-eyes (Zosterops japonicus), house finch (*Paroaria coronata*), and rose-ringed parakeets (*Psittacula krameri*) were observed less frequently.

Although not seen during the survey, the Hawaiian hawk or Io *(Buteo solitarius)* occurs on Hawaii island and could potentially utilize trees in and around the project area for habitat and/or nesting. The Hawaiian hawk has been delisted as Endangered by Federal agencies (USFWS, 2022) but is still listed by the State as Endangered. The hawks can be found from sea level to above 8,990 feet. Hawaiian hawks construct their nests approximately two months before laying eggs. Nest trees range from 32 to 79 feet high, and the nests are typically 11 to 60 feet above ground. Nests are constructed on stable platforms such as on the top of bird-nest ferns or crotches within the branches of the trees (Griffin et al., 1998).

During the survey, domesticated dogs were heard in the area. No other mammals were observed within the project area, but feral cats (*Felis catus*), dogs (*Canis lupus familiaris*), pigs (*Sus scrofa*), small Indian mongoose (*Herpestes javanicus*), and rodents such as European house mice (*Mus musculus domesticus*), roof rats (*Rattus r. rattus*), brown rats (*Rattus norvegicus*), or possibly Polynesian rats (*Rattus exulans hawaiiensis*) likely use resources found within the project area. All these introduced mammals are harmful to native ecosystems and native faunal species if their populations are unmanaged.

An established infestation of little fire ants *(Wasmannia auropunctata)* was noted in the vegetated areas of the project area. This invasive ant species has been detected on Hawaii Island since 1999. The ants are extremely small, but their sting can cause painful welts and extreme itching. Care should be taken during any future surveys, clearance, or habitation that proper protective clothing is worn, and that movement of ants is limited by removing clothes and washing boots before working in other areas. Cleaning construction vehicles is also recommended when possible and/or when moving machinery between work sites.

2.2.2.2 Potential Impacts and Proposed Mitigation Measures

2.2.2.2.1 Proposed Action

Under the Proposed Action Alternative, potential impacts to native fauna may occur. The proposed project may affect but is not likely to adversely affect the Hawaiian hawk. The following measures are recommended prior and during construction to avoid impacts to the Hawaiian hawk:

- A nest survey is recommended of the immediate area around the construction site during the Hawk breeding season (March through September) at least 10 days before the initial start of construction. The survey should be conducted by a qualified biologist using appropriate survey methods and should focus on the large trees that could provide nesting habitat.
- If active nest(s) are located, no construction should occur within 1600 feet of the nest until the chicks fledge or the nest is abandoned.
- If Hawaiian hawks are detected in the area during construction, all activities within 100 feet of the bird should cease. Work may continue when the bird has left the area on its own.

2.2.2.2.2 No Action Alternative

Under the No Action Alternative, no beneficial or adverse impacts to native fauna would occur.

2.2.3 Special Status Species and Critical Habitats

2.2.3.1 Existing Conditions

Although no ESA-listed species were identified during the site survey, the Official Information for Planning and Consultation (IPaC) species list (Project Code: 2025-0085523) identified several plant and animal species protected by the ESA that may occur in the project area (Pacific Islands Fish and Wildlife Office [PIFWO], 2025; Appendix B; and summarized in Table 4, below). These ESA-listed native and indigenous species typically occur in undisturbed and undeveloped areas. Due to the nature of the disturbed landscape and development of the parcels in the project area, there are no usable habitat or conditions for these species within the project area. There is no designated or proposed critical habitat within the project area (USFWS, 2024b). Tables 4 and 5 provide the ESA-listed species identified by IPaC as potentially occurring in the project area.

Table 4: Protected ESA Plant Species

Class	Common Name	Scientific Name	Federal Listing
Plant	Alani	Melicope zahlbruckneri	Endangered
Plant	Haiwale	Cyrtandra nanawaleensis	Endangered
Plant	Hau kuahiwi	Hibiscadelphus giffardinaus	Endangered
Plant	Nanu	Gardenia remyi	Endangered
Ferns & Allies	Deparia kaalaana	Deparia kaalaana	Endangered
Ferns & Allies	Microlepia strigosa var. mauiensis	Microlepia strigosa	Endangered

Source: PIFWO, 2025. IPaC. Accessed August 20, 2025. Accessible online at: https://ipac.ecosphere.fws.gov/.

Table 5: ESA-Protected Fauna and Migratory Species

Class	Common Name	Scientific Name	Hawaiian Name	Federal Listing	State Listing
Mammal	Hawaiian hoary bat	Lasiurus cinereus semotus	ʻōpeʻapeʻa	Endangered	Endangered
Reptile	Hawksbill sea turtle	Eretmochelys imbricata	honu ʻea	Endangered	Endangered
Seabird	Band-rumped storm-petrel	Hydrobates castro	ʻakēʻakē	Endangered	Endangered
Seabird	Newell's shearwater	Puffinus auricularis newelli	ʻaʻo	Threatened	Threatened
Seabird	Hawaiian petrel	Pterodroma sandwichensis	uaʻu	Endangered	Endangered
Waterbird	Hawaiian stilt	Himantopus mexicanus knudseni	aeʻo	Endangered	Endangered
Waterbird	Hawaiian coot	Fulica alai	ʻalae keʻokeʻo	Endangered	Endangered
Waterbird	Hawaiian duck	Anas wyvilliana	koloa maoli	Endangered	Endangered
Waterbird	Hawaiian goose	Branta (=Nesochen) sandvicensis	nene	Threatened	-

Source: PIFWO, 2025. IPaC. Accessed 20 August 2025. Accessible online at: https://ipac.ecosphere.fws.gov/.

2.2.3.1.1 Hawaiian Hoary Bat

Although not observed during the daytime surveys; the Hawaiian hoary bat may be present and active at night in the area due to its location and the presence of many large mature trees. Some large trees near the stream within the project area may need to be removed for the bridge widening. If woody trees or

shrubs 15 feet or taller are cleared when bats are pupping, there is a risk that adults may abandon their young or that young bats could inadvertently be harmed or killed during vegetation removal efforts. Additionally, Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground (Montoya-Aiona, 2020) and can become entangled in barbed wire used for fencing (USFWS, 2011).

2.2.3.1.2 Hawksbill Sea Turtle

Hawksbill sea turtle species occur in nearshore and offshore waters throughout the Main Hawaiian Islands. Turtles may rest, forage, or breed in nearshore waters. Females looking to nest and hatchlings emerging from nests can be adversely affected by nighttime light pollution. Females may abandon their nesting attempts and disoriented hatchlings wander inland instead of to the ocean (DLNR, 2015). The proposed project is unlikely to affect the Hawksbill sea turtle. The project area is over 5 miles inland from the nearest coastline, which has no sea turtle nesting habitat (i.e., sandy beach). There is no direct line-of-sight to the shoreline (let alone to shoreline that would likely be used for nesting). Furthermore, Four Mile Creek does not drain into the ocean (USACE, 2021), so any adverse effects to water quality from construction would not have an impact on the marine species.

2.2.3.1.3 Hawaiian Seabirds

Three species of ESA-listed Hawaiian seabird species were identified by IPaC as potentially occurring in the proposed project area. These include two endangered species, the band-rumped storm-petrel and Hawaiian petrel, and the threatened Newell's shearwater, all of which display nocturnal behaviors. None of these species were observed during the survey and the project area does not provide foraging or nesting habitat; however, nocturnal Hawaiian seabirds may fly over the project area where they could be harmed by artificial nighttime lights. Artificial lights can disorient fledglings, causing them to fall to the ground (i.e., fallout) exhausted or increasing their chance of colliding with structures (Raine et al., 2017). Once on the ground, fledglings are unable to fly and die by vehicle strikes, predation, starvation, dehydration, and injuries (Travers et al., 2021). Because the fledging period for all nocturnal seabirds in Hawaii differs among islands and bird species, the general fallout season throughout the State is considered from September 15 to December 15 (DLNR, 2023).

2.2.3.1.4 Hawaiian Waterbirds

Four species of waterbird (Hawaiian coot, Hawaiian duck, Hawaiian goose, and Hawaiian stilt) were identified by IPaC as potentially occurring in the proposed project area. These species use a variety of wetland and open water environments; however, each requires specific wetland requirements for foraging, resting, sheltering, and nesting that can limit or increase the likelihood of their occurrence (Engilis and Reid, 1994; Reed et al., 2011). No waterbirds were observed during the survey, and suitable habitat was not identified.

2.2.3.1.5 Hawaiian Coot

Hawaiian coot habitat includes freshwater and brackish ponds, irrigation ditches, and taro fields, with nest initiation primarily between March and September. Nest building is strongly tied to rainfall because appropriate water levels are critical to nest success. The Hawaiian coot is not commonly found along portions of east Hawaii, including the region of the proposed project (DLNR, 2015), and optimal wetland habitat does not exist at the project area. Therefore, the Hawaiian coot is unlikely to occur at the project area.

2.2.3.1.6 Hawaiian Duck

Hawaiian ducks are only known to occur and breed on Kauai (Uyehara et al., 2007; and Fowler et al., 2009). Optimal habitat for this species does not exist in the project area. Further, any conservation

measures implemented for coots and stilts would also apply to ducks, and hence they are addressed, if only by default.

2.2.3.1.7 Hawaiian Goose

The Hawaiian goose is found on Hawaii island in a variety of habitats with a preference for open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows (State of Hawaii, 2022a). Threats to the species include introduced mammalian predators and vehicle strikes. This species nests at higher elevations and congregates around open water bodies with sparse vegetation. Optimal nesting or foraging habitat does not exist in the project area. Therefore, the Hawaiian goose is unlikely to occur at the project area.

2.2.3.1.8 Hawaiian Stilt

Stilts are typically shorebirds, preferring brackish water and foraging in the shallows with sparse, low-growing vegetation. They utilize different habitats for nesting, including adjacent to or on low islands with standing fresh, brackish, or saltwater habitats, or open tidal flats (DLNR, 2015). Usable habitat does not exist in the project area or the vicinity. Therefore, the Hawaiian stilt is unlikely to occur at the project area.

2.2.3.2 Potential Impacts and Proposed Mitigation Measures

2.2.3.2.1 Proposed Action

Under the Proposed Action Alternative, adverse impacts to special status species and critical habitats are not likely to occur. Habitat does not exist at the proposed project area for sea turtles, seabirds, and waterbirds. However, construction activities can impact the Hawaiian hoary bat, Hawaiian waterbirds, and Hawaiian seabirds.

2.2.3.2.2 Hawaiian Hoary Bat

The proposed project may affect the Hawaiian hoary bat because suitable habitat is located within the project area. Clearing woody vegetation greater than 15 feet may occur during the proposed project development. The proposed project may affect but is not likely to adversely affect Hawaiian hoary bats if the following conservation measures are implemented:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat breeding season (June 1 through September 15).
- Barbed wire will not be used during and post-construction for fencing, including at the contractor staging and storage area.

2.2.3.2.3 Hawaiian Waterbirds

Although the project area does not contain designated critical habitat, IPaC lists four Hawaiian waterbirds that may be found within the project area: Hawaiian coot, Hawaiian duck, Hawaiian goose, and Hawaiian stilt. Effects on waterbirds are not expected if the following measures are taken:

- Avoid creating depressions that could collect standing water in or adjacent to the project area that may attract waterbirds.
- In areas where waterbirds are known to be present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on site.
- Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and filter socks or sandbags, and design and protect construction routes and staging areas to minimize soil erosion and deposits into stream channels.
- As water resources are located within or adjacent to the project area, incorporate applicable water quality BMPs into the project design.
- In a situation when a threatened or sensitive animal species is observed in or within 100 feet of the project area, immediately cease construction within 100 feet of the species and do not approach. Continue work after the individual leaves the area of its own accord.

2.2.3.2.4 Hawaiian Seabirds

The proposed project could affect Hawaiian seabirds because nocturnal species may move through portions of proposed project area. Streetlight design shall conform to American Association of State Highway and Transportation Officials (AASHTO) specifications and guides (AASHTO Section 3.7.13, Codes and Standards), HDOT requirements, and Hawaiian Electric Company, Inc. (HECO) design standards. The streetlights will be 30 feet above the roadway, and primary electrical lines will be 10 feet above the lighting fixtures. Lighting brightness will be based on current State highway lighting requirements and Illuminating Engineering Society of North America recommendations for this type of road and zoning. Fixtures will be equipped with internal optics or reflectors that provide full cutoff distribution to ensure that no light is emitted above the horizontal plane and that the light is fully shielded. All existing lighting poles, bases, lamps, and luminaires will be replaced with new equipment.

The proposed project may affect but is not likely to adversely affect nocturnal seabirds if the following conservation measures are implemented:

- Construction work is conducted during daylight hours only;
- If night work is necessary, it will be strictly avoided during the seabird fledging period, September 15 through December 15 (USFWS, 2023); and
- If night work is necessary, construction lights should not use Light Emitting Diode white light, and light fixtures used must be fully shielded, with upglow (light shining above the horizontal) and reflective light (off the ground surface) eliminated.

2.2.3.2.5 No Action Alternative

Under the No Action Alternative, no impact on special status species and critical habitats would occur.

2.3 SOCIO-ECONOMIC ENVIRONMENT

2.3.1 Socio-Economic Setting

Hilo is a Census-Designated Place (CDP) in the State and County. CDPs are statistical geographies representing closely settled, unincorporated communities that are locally recognized and identified by name (United States Census Bureau, 2023). Hilo is the industrial, commercial, distribution, and

population core of Hawaii Island and is the County seat of Hawaii County. The project area falls within census tracts 207.01 and 209 (State of Hawaii, 2023).

2.3.1.1 Existing Conditions

Hilo's population as of the 2020 Decennial Census was 44,186 with a median age of 41.5. There were approximately 16,752 households, 17,732 housing units, and a median household income of $78,713, per the 2023 American Community Survey 5-year Estimates (United States Census Bureau, 2023).

The population of Hawaii County grew by 20,000 people in the 10 years between 2014 and 2024 (Department of Business, Economic Development & Tourism, 2024). Population density within the County remains the lowest in the State when all land is taken into consideration, but when urban areas of Hawaii island are compared to urban areas of other islands, the population density is similar (Department of Business, Economic Development & Tourism, 2024). These urban areas are experiencing growth at high rates, contributing to rising housing prices and an increase in congestion on the roads.

According to the Climate and Environmental Justice Screening Tool, the project census tracts are not designated disadvantaged. However, tracts to the north and south of the project area in downtown Hilo and Keaau are designated as disadvantaged, due to projected flood risk due to climate change, low income, presence of formerly used defense sites, and high rates of asthma and heart disease (United States Census Bureau, 2023). As shown in Table 6, Hilo CDP has a proportionately higher percentage of population below the poverty level than the State.

Table 6: 2022 Population that Falls Below the Poverty Level for the State of Hawaii, County of Hawaii, CDP of Hilo, and Census Tracts that Include the Project Area

Metric	State of Hawaii	Hawaii County	Hilo CDP	Census Tract 207.01	Census Tract 209
Population Below Poverty Level	135,941	28,088	6,917	1,059	553
Percent Below Poverty Level	10%	14%	15%	20%	11%

Source: U.S. Census 2022 American Community Survey 5-Year Estimates "Poverty Status in the Past 12 Months" https://api.census.gov/data/2022/acs/acs5/subject.

2.3.1.2 Potential Impacts and Proposed Mitigation Measures

2.3.1.2.1 Proposed Action

This project is not expected to cause disproportionate adverse impacts (direct, indirect, or cumulative) on any specific racial, ethnic, or socioeconomic group living in the vicinity of the project area because the project will not affect the community in an adverse manner. The use of the project area will not significantly change, and the project will provide a safer, more efficient multimodal transportation system and pedestrian and bicycle infrastructure for non-automobile users, making transportation more accessible to people.

In the short term, the project will create jobs related to construction for the duration of project construction, which will be approximately two years long. The creation of construction-related jobs will provide beneficial impacts on employment rates.

Increasing the range of modes of transportation that can use the proposed Four Mile Creek Bridge, with bike lanes and pedestrian walkways, is expected to positively impact those who commute by bicycle or

on foot. The reliance on cars is reduced and the accessibility of the public roadway to multiple means of transportation is increased.

2.3.1.2.2 No Action Alternative

Under the No Action Alternative, no disproportionate adverse impacts on specific racial, ethnic, or socioeconomic group living in the vicinity of the project area would occur, and no adverse impacts to environmental justice or disadvantaged populations would occur. However, the community would not be able to fully benefit from the impact of developing multimodal transportation alternatives for the area (including the benefit of jobs created), and the bridge's limited traffic capacity would be further exacerbated by growing population trends.

2.3.2 Infrastructure and Public Utilities

2.3.2.1 Existing Conditions

The existing roadway infrastructure is a one-lane bridge. The intersection is currently side-street-stop controlled with stop signs located on the Haihai Street (west leg) and Aumakua Gardens (east leg) approaches.

Traffic volume data were gathered for the Four Mile Creek Bridge at Kilauea Avenue and Haihai Street. Full results of this investigation can be found in Appendix A. Key findings from the data include confirmation that the intersection in its existing condition is operating poorly in both the morning and evening peak periods. Specifically, the eastbound approach experiences significant delays. A traffic signal analysis conducted at the site determined that the intersection, in the existing condition, warrants signalization.

There are two existing 8-inch waterlines within Kilauea Avenue from the intersection with Haihai Street headed north, and one existing 8-inch waterline heading south. There is also an existing 6-, 10-, and 16-inch waterline within Haihai Street from the intersection with Klauea Avenue heading west, and an existing 6- and 16-inch waterline heading east into TMK 2-2-043:043. There is one existing storm inlet, with grate and cover, as well as a water valve box and water meter along the length of the project area. The drainage inlet discharges into Four Mile Creek, where it continues into the Kaahakini Flood Channel. There are 11 existing utility poles within the project area, utilized primarily by HECO and Hawaiian Telcom.

The County also has plans under a separate project (i.e., *The Safe Route to Waiakea Schools – Kīlauea Avenue*) to improve sidewalks and the roadway along Kilauea Avenue. The SRTS plan includes comprehensive sidewalk improvements to improve multimodal transportation options to schools. The SRTS' sidewalk improvements and road restriping start at Ohea Street and end 1.5 miles south at Haihai Street, just north of the Four Mile Creek Bridge. Construction of the SRTS project will be separated into three phases. The third phase, from Kawailani Street to Haihai Street, will connect with the north end of the Four Mile Creek project and is estimated to begin construction in March 2028.

2.3.2.2 Potential Impacts and Proposed Mitigation Measures

2.3.2.2.1 Proposed Action

Under the Proposed Action Alternative, the existing one-lane vehicle bridge on Klauea Avenue will be replaced with a two-lane bridge with additional bike lanes, sidewalks, and required safety guards, road markings, and signage. Furthermore, the proposed project would modify and improve the north and southbound approaches to the bridge, including the addition of a traffic signal at the Klauea Avenue and

Haihai intersection north of the bridge. ADA-accessible curb ramps and sidewalks will improve the accessibility and safety of the project area for pedestrians.

The contractor will phase demolition and construction to preserve continuous utility service. Construction of the bridge is intended to be phased to maintain vehicle access along Klauea Avenue; with the current bridge remaining in service while the first half of the new bridge is built, then that built one-lane bridge will open while the old bridge is demolished and rebuilt. Construction is anticipated to take two years.

The 8-inch water line heading south of the intersection with Haihai Street will need to be relocated. Construction plans will be submitted for review and approval to the Department of Water Supply (DWS). Coordination with DWS has already been initiated. The DWS does not foresee any planned water line improvements within the Four Mile Creek project area while bridge replacement activities are underway at this time (Appendix D).

Seven utility poles will be protected in place within the project area. Two communication poles along the east side of Kīauea Avenue and two communication poles along the west side will be relocated to accommodate construction. Two new utility poles will be installed by the utility company on the east side of Klauea Avenue. The utility companies will relocate the poles.

Stormwater infrastructure will be improved by the Proposed Action with the addition of curb and gutter and catch basins to direct stormwater. An 18-inch drainage pipe will be installed perpendicular to Klauea Avenue. The Proposed Action will not cause any adverse impacts and will instead upgrade and improve public infrastructure and utilities in the area.

The southernmost point of the County's SRTS project will connect to the northernmost point of the Four Mile Creek project. It is anticipated that the Four Mile Creek Bridge project will be approaching completion as the SRTS project is beginning construction in March 2028. If this should happen, the County will ask the SRTS contractor to begin work from the Kawailani Street side of the project to minimize potential conflicts and cumulative impacts during construction.

The Four Mile Creek Bridge improvements support the goals laid out in the SRTS plan: expanding bicycle and pedestrian access and safety within the project area. The combination of improvements to transportation infrastructure by both projects will improve pedestrian connectivity, safety, and access in the project area and have beneficial cumulative effects on the community in the long term.

2.3.2.2.2 No Action Alternative

Under the No Action Alternative, the Four Mile Creek Bridge would continue to be a one-lane bridge without adequate lane widths, shoulder widths, or clearances to serve increasing traffic demands, which would likely result in increased traffic congestion and delays, as documented by the Traffic Impact Analysis Report (Appendix A). Safety concerns for drivers heading north and southbound over the one-lane bridge will remain due to northbound traffic yielding to southbound vehicles. The left turn from northbound Klauea Avenue to westbound Haihai Street (on the north side of the bridge) would continue to lack a traffic signal. Because there is no left turn lane for this movement onto Haihai Street, northbound traffic on Klauea Avenue south of the bridge backs up, especially during peak travel periods.

2.3.3 Solid Waste Facilities

2.3.3.1 Existing Conditions

The Department of Environmental Management (DEM), Solid Waste Division, manages the County's solid waste operations. The division operates 21 transfer and recycling facilities, two green waste facilities, one active landfill (West Hawaii Sanitary Landfill), one reload facility, eight reuse centers, and three key programs on-island: Recycling, HI-5 Redemption, and the Derelict and Abandoned Vehicles program. The South Hilo Sanitary Landfill permanently closed in 2020.

The West Hawaii Sanitary Landfill is the only operational landfill on island that accepts C&D waste. The landfill is located approximately 71 miles from the project area via Senator Daniel K. Inouye Highway (Route 200). A Solid Waste Facility Disposal Permit is required for disposal of solid waste.

2.3.3.2 Potential Impacts and Mitigation Measures

2.3.3.2.1 Proposed Action

The Proposed Action would create C&D waste that would require proper handling during transportation and disposal at the West Hawaii Sanitary Landfill. The volume of waste generated is not expected to significantly affect landfill operations or capacity in normal conditions. However, the County DEM should be consulted as part of the design phase to coordinate the estimated timing when C&D activities will occur. A Solid Waste Management Plan will be developed through coordination with the County as the project design matures to minimize impacts on their solid waste facilities. There are no anticipated significant beneficial or adverse impacts to solid waste facilities from the Proposed Action.

2.3.3.2.2 No Action Alternative

Under the no action alternative, there will be no adverse or beneficial impacts to current solid waste infrastructure or services.

2.3.4 Visual Resources

Visual resources are natural and manufactured features that provide human appealing aesthetic qualities to an area. These features form the overall impression that a human observer perceives of an area or its landscape characteristics. Landforms, water surfaces, vegetation, and manufactured features would be characteristics of an area if they are inherent to the structure and function of a landscape.

2.3.4.1 Existing Conditions

The County General Plan includes the goal to "protect scenic vistas and view planes from becoming obstructed" (County of Hawaii, 2014). The plan states that important views within the South Hilo District include views of Mauna Koa, Mauna Loa, Hilo Bay, coastal areas, and waterfalls. None of these visual resources are visible from the project area.

The project area is moderately urbanized, including residential and public lands. Relatively undeveloped and agricultural lands are found in the upper elevations of the study area with increasing development towards Hilo Bay. The visual aesthetics of these areas are typical of suburban and pastoral environments.

2.3.4.2 Potential Impacts and Proposed Mitigation Measures

2.3.4.2.1 Proposed Action

Under the Proposed Action, important scenic vistas would not be affected, and the character of the project area would not be altered significantly. The bridge and roadway changes would not be of a size or scale that would change the overall visual quality of the project area. Furthermore, the bridge railings will be constructed to mimic the look of the existing rectangular inlaid panel barrier rail to minimize changes to the visual character of the existing bridge. Details of mitigation efforts to preserve aesthetic features of the bridge have been determined during HRS Chapter 6E review by the State Historic Preservation Division (SHPD; see Section 2.3.5 - *Cultural and Archaeological Resources*), including that the proposed design will include Manual for Assessing Safety Hardware (MASH)-compliant solid concrete railings to resemble the original.

2.3.4.2.2 No Action Alternative

Under the no action alternative, there will be no impact to visual resources.

2.3.5 Cultural and Archaeological Resources

The proposed project is subject to review under HRS Chapter 6E and HAR §13-275. To support the reviews, an Archaeological Literature Review and Field Inspection (ALRFI; Appendix C) was conducted for the project according to standards outlined in HAR §13-276 for Archaeological Inventory Survey studies and is intended to assist with the project's compliance with HRS §6E-8 and HAR §13-275 in consultation with the SHPD. Fieldwork was performed under archaeological permit number 23-23 and 24-26 issued to Honua Consulting by the SHPD in accordance with HAR §13-282 (Honua Consulting, 2025).

Per Chapter 13-275-6(b) of the HAR, buildings are protected by HRS §6E-8 if they meet "significant criteria". This section refers to those properties that are considered eligible for the National Register or meet the "significant criteria" (protected under HRS §6E-8) as "significant historic properties" to distinguish them from those that are considered historic because they are over 50 years old.

2.3.5.1 Existing Conditions

Hawaii Island contains the greatest concentration of historic bridges in the state due to its rural nature, lack of development, and abundant streams. The Four Mile Creek Bridge (State Bridge Number 001019201400400) is a concrete tee beam bridge with a concrete solid panel with cap. The construction date is listed as 1916 in the State Bridge Inventory, although the bridge is inscribed with a date of construction that reads 1921 (Figure 18 and 19, Appendix C), a date which coincides with the opening of the Waiakea Homesteads that same year. The bridge was altered into its current configuration in 1964. The ALRFI details the project area's land use history, locates and identifies historic properties or component features in the project area, and evaluates the proposed project's potential effect on historic properties and cultural practices.

Although no previous archaeological studies have been conducted that included the project area, the Four Mile Bridge has been subject to an architectural evaluation as part of the State Bridge Inventories of 2014 and 2024 (WSP USA, 2024). The Four Mile Creek Bridge was assessed for significance as eligible for listing under the National Register of Historic Places under Criterion C as a good example of a 1920s reinforced concrete tee beam bridge that is typical of its period and its use of materials, method of construction, craftmanship, and design.

An ALRFI was conducted by Honua Consulting, and a draft report was published in August 2025. The archaeological field inspection consisted of a 100 percent pedestrian survey of the traversable portions of the project area. The project area was completely developed, and no historic properties were documented, and no significant artifacts or features were encountered during the field inspection. The lack of historic properties is due to the project area being almost entirely developed and within existing road ROWs, the Four Mile Creek Bridge crossing, and the former Pana‘ewa Farm Lots (Appendix C).

The historical land use of the project area was also a thoroughfare. The road alignment and bridge that comprise the project area roughly follow the path of a traditional Hawaiian trail that would become the Volcano Road. Throughout much of the 1800s it was a horse trail and the main thoroughfare for foreigners visiting the Volcano House at Kīlauea Volcano. Construction of the 30-mile-long Volcano Road from Hilo to Kīlauea began in 1891 to the west of the project area, and the carriage road was completed in 1894 and shortened the travel time to the volcano considerably (Appendix C).

No mooleo or any other historical information was found regarding traditional use of the project area. No archaeological evidence has been found and it is likely that any traditional sites present were displaced or destroyed during original construction of the Four Mile Creek Bridge in 1916 and the completion of the Waiakea Homesteads in 1921. (Appendix C).

2.3.5.2 aPotential Impacts and Proposed Mitigation Measures

2.3.5.2.1 Proposed Action

The existing historic Four Mile Creek Bridge will be replaced with a two-lane bridge. Recommendations include consultation with SHPD and an evaluation of the historic structure by a qualified architectural historian (Honua Consulting, 2025). Consultation with the SHPD through Chapter 6E has been completed. This consultation included an evaluation of historic buildings and structures, including the existing bridge, and resulted in recommendations for the bridge’s aesthetic design to ensure that the historic character of the existing structure is preserved. SHPD concurs with DPW’s effect determination of “Effect, with proposed mitigation commitments” for the demolition of the Four Mile Creek Bridge per HAR §13-275-7(a)(2). SHPD also concurs with DPW’s proposed mitigation commitments, noted below.

No archaeological resources were found, nor is there record of traditional use of the project area. Because this area is already fully developed, no effects are expected to cultural resources or traditional or customary practices as a result of the Proposed Action. To further protect cultural resources, the following avoidance and minimization measures will be implemented to extent practicable:

- Conduct large-format photographic documentation of the existing bridge in accordance with Historic American Engineering Record (HAER) guidelines before the structure is removed or altered.
- Context Sensitive Design: The proposed bridge design shall include MASH-compliant solid concrete railings to resemble the original.
- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can access the nature and significance of the find.
- If previously unidentified non-burial historic properties, or unanticipated effects are discovered, the DPW shall follow HAR Chapter 13-280 “Rules Governing General Procedures for Inadvertent

Discoveries of Historic Properties During a Project Covered by the Historic Preservation Review Process."

- If human remains are discovered, HAR, Title 13, Subtitle 13, Chapter 300 states that further disturbance and activities shall cease in any area or nearby area suspected to overlie remains, and the State Historic Preservation Division and the Police Department will be contacted. The appropriate process would then proceed in conformance with HAR § 13-300, Subchapter 4 "Procedures for Property Treatment of Burial Sites and Skeletal Remains."

2.3.5.2.2 No Action Alternative

Under the No Action Alternative, the Four Mile Creek Bridge will not be replaced or renovated, and there would be no effect on the historic bridge structure.

3. Relationship to Land Use Plans, Policies, and Controls

Development of any proposed alternative will require environmental planning and permitting consisting of federal, state, and local permits and approvals, as described below. Additional permits, such as solid waste management, noise permits, and building permits, that may be required of the contractor during construction are listed in Section 1.8.

3.1 FEDERAL REGULATIONS AND PERMITS

3.1.1 Clean Water Act of 1972

The CWA establishes the structure for regulating pollutant discharges into WotUS. A Section 401 Water Quality Certification (WQC) is required when the action needs a federal permit, license, certificate, approval, registration, or statutory exemption, and may result in any discharge of a pollutant into State waters. The proposed project is not subject to any of these triggers.

Section 402 of the CWA describes requirements for permitting point source pollutants that discharge into surface waters under the NPDES. The 401 WQC program and the NDPES program in Hawaii are administered by the HDOH Clean Water Branch. The proposed project is anticipated to disturb greater than one acre of land (as defined by the HDOH NPDES rules) and will, therefore, require a Section 402 CWA NPDES permit for stormwater discharges associated with construction activities. The project will likely fall under the State's general permit for discharge of construction-generated stormwater from a construction site and will be guided by the Stormwater Pollution Prevention Plan submitted with the Notice of Intent requesting coverage under the general permit.

The 8-inch waterline that runs south from the Haihai Street intersection and across the bridge will be located as part of the proposed project. Replacement of the waterline may require a Section 402 CWA NPDES permit associated with hydrotesting.

Under Section 404 of the CWA, a USACE Department of the Army permit is required for the discharge of dredge or fill material into WotUS, including wetlands. The Four Mile Creek section of Ka'ahakini Stream does not meet the definition of WotUS under the "Revised Definition of 'Waters of the United States'" (discussed in Section 2.1.4), as it is intermittent and dry for the majority of the year, exempting the project from these requirements. An Approved Jurisdictional Determination was received from the USACE in March 2026.

3.1.2 National Environmental Policy Act of 1969

NEPA established a process for reviewing environmental impacts of actions taken by the federal government, including related economic, social, and cultural effects. The environmental review under NEPA can involve three different levels of analysis: Categorical Exclusion determination, EA/Finding of No Significant Impact (FONSI), or EIS. NEPA compliance for this project is not triggered, because there is no federal funding nor are federal permits are required.

3.1.3 Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 was established to protect navigable waters and tidally influenced waterways. Section 10 of the Act prohibits obstructions and requires a permit and authorization from

the USACE before construction of any structure over, excavation from, or disposal of materials into navigable waters. Section 9 of the Act requires authorization from the USACE for construction of any structure (e.g., bridge, dam, dike, or causeway) over or in navigable WotUS. Four Mile Creek does not have a surface connection to traditional navigable waters (i.e., the Pacific Ocean) and project area is located upstream of tidal influence. Therefore, the Proposed Action is not anticipated to require Section 9 or 10 authorization.

3.1.4 Section 106 of the National Historic Preservation Act of 1966

The NHPA requires federal agencies to consider the effects of their decisions on historic properties and affords the Advisory Council on Historic Preservation, an independent federal agency, a reasonable opportunity to review and comment on such actions. Section 106 requires federal agencies to identify and assess the effects of its actions on historic resources. Section 106 is not triggered by the proposed action, as it is not a federal action. The SHPD has review and approval authority in Hawaii; further discussion is included in Section 3.2.3 - *State Historic Preservation Review*.

3.1.5 Section 7 of the Endangered Species Act of 1973

The ESA directs all federal agencies to conserve endangered and threatened species and to use their authorities to further the purposes of Section 7 of the Act. "Interagency Cooperation" is the mechanism by which federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. In Hawaii, Section 7 consultation typically involves consulting with the USFWS PIFWO and the National Oceanic and Atmospheric Association National Marine Fisheries Service. A Section 7 consultation is not required for the proposed action as it is not a federal action.

A survey of biological resources in the project area was conducted for the project Action Area and did not identify any T&E species or affected critical habitat for those species (Appendix B). The USFWS IPaC tool verified that no designated critical habitat overlaps with the project's Action Area. Refer to Section 2.2 - *Biological Resources*, for additional discussion about species observed, as well as recommendations for avoidance and minimization measures to T&E species.

3.1.6 Coastal Zone Management Act of 1972

The Coastal Zone Management Act of 1972 (CZMA), Section 307, requires federal agency activities and development projects affecting any coastal use or resource to be undertaken in a manner consistent to the maximum extent practicable with the State's Coastal Zone Management (CZM) program. In Hawaii, the entire state is under CZM program jurisdiction. See Section 3.2.5 - *Coastal Zone Management, Hawaii Revised Statutes Chapter 205A.* A CZM consistency review is not required for the proposed action, as it is not a federal action.

3.2 STATE REGULATIONS, PERMITS, AND PLANS

3.2.1 Hawaii Revised Statutes Chapter 343

HRS Chapter 343 codifies HEPA, which promulgates the State's environmental review process. Nine specific types of actions "trigger" the requirement for HEPA review. If a Proposed Action is not exempt, an EA or EIS must be prepared. The approving agency determines if the impacts of a proposed action are significant enough to warrant the preparation of an EIS or issue a FONSI.

The proposed use of State and County funds, use of State and County Lands and use of land within the State Land Use-Designated Conservation District triggers HRS Chapter 343; and thus, HEPA review is required for the project. The Proposed Action does not qualify as an exempt activity under DPW's HRS Chapter 343 Exemption List, which was approved by the Environmental Council on January 5, 2021. Thus, an EA or EIS is required for the proposed project. As this is an agency action, the approving agency would be the County.

3.2.2 State Land Use Commission, Hawaii Revised Statutes Chapter 205

HRS Chapter 205-2 establishes a Land Use Commission that classifies all lands in the state into four categories of zoning: Urban, Rural, Agricultural, and Conservation. Urban districts contain activities or uses provided by ordinances or regulations of the County where the urban district is situated. Land uses in urban districts are governed by the County government. The Conservation District includes areas necessary for:

1. Protecting watershed and water sources;
2. Preserving scenic and historic areas;
3. Providing park lands, wilderness, and beach reserves;
4. Conserving endemic plants, fish and wildlife, including those which are threatened or endangered;
5. Preventing floods and soil erosion;
6. Forestry;
7. Open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources;
8. Areas of value for recreational purposes;
9. Other related activities; and
10. Other permitted uses not detrimental to a multiple use conservation concept (HRS Chapter 205-2(e)).

Within the Conservation District are five progressively restrictive subzones: general, limited, protected, resource, and special. Decision-making and approvals within the Conservation District are made by the DLNR OCCL. The project area and adjacent properties are designated urban and conservation, as shown in Figure 6.

Approximately 6.18 acres of the proposed project area will occur within the Conservation District – General Subzone. Temporary construction staging and storage areas within the Conservation District and permanent acquisition of approximately 1.18 acres of land to expand the bridge within this direct will require a CDUP. HAR §13-5-22 regulates land uses and activities in conservation district subzones. The Proposed Action is regulated under HAR §13-5-22 Section P-6, Public Purpose, D-1. This land use is described as follows: "*Not for profit land uses undertaken in support of a public service by an agency of the county, state, or federal government, or by an independent non-governmental entity, except that an independent non-governmental regulated public utility may be considered to be engaged in a public purpose use. Examples of public purpose uses may include but are not limited to public roads, marinas, harbors, airports, trails, water systems and other utilities, energy generation from renewable sources,*

communication systems, flood or erosion control projects, recreational facilities, community centers, and other public purpose uses, intended to benefit the public in accordance with public policy and the purpose of the conservation district."

A Board-level CDUP will be prepared for the project. A Ka Paakai analysis was performed for the Proposed Action during preparation of the CDUP application, based on Honua's 2025 findings. Ka Paakai analysis is a legal framework that government agencies must follow when evaluating proposed projects with regards to Native Hawaiian traditional and customary rights. Further discussion regarding the identity and scope of resources in the area, the extent to which those resources may be impaired, and any feasible actions to be taken to protect such resources/practices is detailed in Section 2.3.5.

3.2.3 State Historic Preservation Review (HRS Chapter 6E)

HRS Chapter 6E requires that before any agency or officer of the State or counties approves any project involving a permit, license, certificate, land use change, subdivision, or other entitlement for use that may affect a historic property, the agency shall advise the SHPD and allow them an opportunity to review the potential effects of the proposed project, if any, on historic properties or burial sites. SHPD reviews projects for impacts on historic properties to lessen or mitigate those impacts. HRS §6E-8 applies to direct State and County projects (e.g., a State or County agency's construction project), while HRS Chapter 6E-42 applies to state and county agency approval of private projects (e.g., issuing a permit, land use change, or other entitlement for use) that may affect a historic property.

An ALFRI (Appendix C) has been conducted to inform the Chapter 6E-8 consultation with SHPD. The Four Mile Creek Bridge is considered historic due to its age (more than 50 years). The Chapter 6E review has been completed, and SHPD concurs with DPW's effect determination of "Effect, with proposed mitigation commitments" for the demolition of the Four Mile Creek Bridge per HAR §13-275-7(a)(2). SHPD also concurs with the DPW's proposed mitigation commitments.

3.2.4 Stream Channel Alteration Permit

A Stream Channel Alteration permit is required for any temporary or permanent activity within a stream bed or banks that may obstruct, diminish, destroy, modify, or relocate a stream channel and is administered by the State DLNR Commission on Water Resources Management (CWRM).

A SCAP is also required for work that would change the direction of flow of water in a stream channel, placing any materials or structures in a stream channel, or removing any material or structure from a stream channel. The DLNR defines streams as any rivers, creek, slough, or natural water course that usually flows in a defined bed or channel. Riprap in the stream channel is needed to protect the abutments and fill will be removed from the stream below the bridge; however, the Four Mile Creek segment of Kaahakini Stream that runs below the bridge is non-perennial and may not be regulated by CWRM. A SCAP Request for Determination was submitted to the CWRM to determine if a SCAP permit is required. CWRM responded that that they will not require a stream channel alteration permit to be submitted because the proposed work will not adversely affect instream uses of water on November 19, 2025.

3.2.5 Coastal Zone Management, Hawaii Revised Statutes Chapter 205A

In Hawaii, the CZM program (see also Section 3.1.6) is managed by the State, Office of Planning and Sustainable Development (OPSD). A CZM federal consistency review is required if a federal permit or license and activities conducted with federal financial assistance affects coastal uses and resources. CZM

federal consistency provisions ensure that federal agencies cannot act without regard for, or in conflict with, state policies that have been officially incorporated into a state's CZM program. The entire State is considered within the CZM area. This project does not require a review for federal CZM consistency.

3.2.6 Hawaii State Plan

Pursuant to HRS Chapter 226, the Hawaii State Plan serves as the framework for guiding the State's long-range development. The Hawaii State Plan outlines statewide goals, objectives, policies, and priorities; establishes a basis for setting priorities and allocating limited resources; enhances coordination among Federal, State, and County plans, policies, programs, projects, and regulations; and creates a system for plan formulation and program coordination to integrate all major State and County activities.

Within the Hawaii State Plan, facility systems are recognized as critical to supporting the State's quality of life, economic vitality, and environmental sustainability. Facility systems objectives include the development and maintenance of reliable, efficient, safe, and sustainable transportation, water, wastewater, energy, and communication infrastructure. In particular, the transportation-related objectives call for the development of a balanced, multimodal system that promotes the economical, convenient, and safe movement of people and goods, reduces reliance on single-occupancy vehicles, and provides resilience against future growth and natural hazards.

The proposed bridge replacement project aligns with, and advances, objectives of the State Plan related to facility systems. These objectives emphasize the importance of multimodal transport systems, promoting the efficient, economical, safe and convenient movement of people and goods. The existing one-lane bridge is both structurally deficient and functionally obsolete, limiting capacity, creating traffic bottlenecks, and posing safety hazards. Replacing it with a modern, multi-lane bridge designed to meet current safety and engineering standards will not only improve travel efficiency and reduce congestion but will also enhance regional connectivity and emergency access. Furthermore, by incorporating multimodal features—such as bicycle and pedestrian accommodations—the project broadens transportation options, promotes more sustainable mobility, and aligns with the State's commitment to reducing GHG emissions and improving community resilience.

3.2.7 Hawaii Statewide Transportation Plan 2045 – Draft November 2022

The Hawaii Statewide Transportation Plan provides guidance to system-level and master plans of the three primary modes of transportation used in Hawaii—the air, water, and land transportation systems—as well as non-motorized modes and intermodal connections (County of Hawaii, 2023). HDOT's mission statement in relation to highways is "to maximize available resources to provide a safe, efficient, accessible, and sustainable State Highway System that ensures the mobility of people and goods and supports economic vitality and livability". The seven identified goals of this plan align closely with the Four Mile Creek Bridge replacement effort. Safety and security will increase under the Proposed Action, as the proposed bridge design conforms to modern safety standards. The proposed bridge incorporates a multimodal system and improves mobility, enhancing access to destinations through bridge widening and incorporation of bicycle and pedestrian pathways. The Proposed Action will support a vibrant and changing economy through improving efficiency of travel and provides climate change adaptation by orienting design to accommodate worsening storm events. Climate and environmental impacts from this bridge and intersection will be reduced as congestion-related emissions are reduced, improving air quality.

3.2.8 Federal-Aid Highways 2035 Transportation Plan for the District of Hawaii

The Federal-Aid Highways 2035 Transportation Plan (HDOT, 2014) for the District of Hawaii is a foundation for making informed land transportation planning decisions through 2035. Through the planning process, public input was sought. The goal identified by constituents to be most important was "to improve capacity and system efficiency by addressing congestion". The proposed project design of the Four Mile Creek Bridge replacement aligns with this goal; reducing congestion on the bridge through traffic management and capacity expansion. In the bridge's existing condition, congestion is frequent as cars try to navigate the one-lane road with no traffic light. The proposed solution includes two-way traffic flow and a turn lane, which is expected to reduce congestion, thereby aligning with the Transportation Plan.

3.2.9 2021 HDOT Climate Adaptation Plan

The 2021 Hawaii Highways Climate Adaptation Action Plan details strategies for a more resilient future (HDOT 2021). The Plan lays out a broad vision for the future of Highways management in the State, including data-driven maintenance plans and efficient programmatic agreements. The Proposed Action is in line with the 2021 Highways plan, as it focuses on structural improvements for a project that is exposed to climate-related hazards (a design goal of the 2021 plan). Four Mile Creek Bridge is exposed to flood risk, and the Proposed Action would make the bridge more resilient by improving structural safety.

3.2.10 Hawaii 2050 Sustainability Plan

The Hawaii 2050 Sustainability Plan (State of Hawaii OPSD, 2021) lays out a clear vision for statewide infrastructure goals. The plan notes that "Hawaii's infrastructure is aging. A lack of sufficient funding for infrastructure, along with population, economic, and development growth, has made it challenging to maintain and improve infrastructure." The Four Mile Creek Bridge replacement project aligns well with these goals by expanding the bridge's capacity to accommodate population, economic, and development growth. In its current state, the Four Mile Creek Bridge is aging and does not conform to modern safety standards. The planned improvements demonstrate a proactive effort to address key infrastructure priorities identified in the Hawaii 2050 Sustainability Plan.

The 2050 Sustainability Plan also incorporates the 2021 Hawaii Highways Climate Adaptation Plan, which acknowledges that aging highway infrastructure is at risk under changing climate conditions. The existing bridge deck is lower than the 100-year flood elevation and the proposed replacement includes an increase in the stream width which will increase stream conveyance under the bridge.

Strategy 14 of the 2050 Sustainability Plan, "Promote Alternative Methods of Transportation", is supported by the Four Mile Creek Bridge replacement project design. The existing bridge accommodates one lane of car traffic, and the proposed bridge will accommodate car traffic in addition to bicycle and pedestrian traffic, with the inclusion of bike lanes and sidewalks with ADA-conforming curb ramps. The proposed design connects multiple modes of transport to the scenic highway system, allowing for alternative methods of transportation to use the road.

3.3 COUNTY REGULATIONS, PERMITS, AND PLANS

3.3.1 Special Management Area, Hawaii County Code

The County defines Special Management Areas (SMA) as land extending inland from the shoreline as delineated on the maps filed with the Planning Commission as of June 8, 1977, or as amended pursuant to HRS §205A-23. No development can occur within the SMA unless a permit is obtained from the County. The project does not include development within the SMA area, so an SMA permit will not be required.

3.3.2 Shoreline Setback Variance

The shoreline setback law regulates uses and activities within the shoreline area to preserve and protect the natural shoreline and to protect against encroachment of structures that may disturb the natural processes of the shoreline and cause erosion of the shoreline. The project does not lie within the County's regulated shoreline, and thus, a shoreline setback variance will not be required.

3.3.3 County of Hawaii General Plan 2045

The Draft County of Hawaii General Plan 2045 was released on September 18, 2023, and guides long-term development of Hawaii Island. It evaluates the island's needs and provides growth strategies for land use, zoning amendments, and capital expenditures (County of Hawaii, 2023). Section 2 of the General Plan, *Infrastructure*, states that "Hawaii will use progressive planning strategies to ensure communities are adequately served by safe and efficient infrastructure networks based on sound design principles that reflect a focus on environmental sustainability, social equity, and preserving character."

Objective 3 of the General Plan's Climate Change goal is to "Improve the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options." Within that goal, the plan states a policy to "design and maintain infrastructure, including roads, buildings, and stream crossings, to accommodate increases in flooding and geologic hazards such as landslides". The Proposed Action will align with this climate adaptation goal by strengthening the bridge to make it more resilient to climate events and future more frequent and severe weather events that may result from climate change effects.

Objective 11 of the General Plan's Transportation Goal is to "Achieve a transportation system that is consistent with and will accommodate planned growth." Within that goal are several policies that the Proposed Action will meet, including Policy 11.1: "Encourage transportation systems that serve to accommodate the present and future development needs of communities", and Policy 11.11: "prioritize public and private transportation investments to expand the multimodal transportation system." The Proposed Action will support these goals by increasing the capacity of the bridge to accommodate future growth and improving pedestrian and bike access to the bridge through the addition of sidewalks and bicycle lanes.

3.3.4 Hilo Community Development Plan 1975

The original 1975 Community Development Plan for Hilo is the most recent comprehensive community plan that covers the project area. Transportation goals were laid out in this plan, including Objective 10: the provision for improved transportation facilities. The plan's specific transportation goals include an "integrated system of bikeways and pedestrian paths", as specified in Chapter 7 of the plan (County of

Hawaii, 1975). The Proposed Action will align with this goal, expanding Four Mile Creek Bridge to include pedestrian walkways and a bike path.

One policy laid out in the plan is that the "programmed improvement of existing thoroughfares and streets should be encouraged" (County of Hawaii, 1975). Additionally, there is a policy to support development between East and West Hawaii. While connecting development has increased in the 50-year period since 1975, this Proposed Action still supports that policy by reducing congestion for drivers on the Hawaii Belt Road, which Kīlauea Avenue feeds into, coming to and from Hilo. It additionally enables other methods of transportation, especially bicycling, access to the Hawaii Belt Road, tying into the Hawai'i Statewide Transportation Plan for 2045.

4. Comments and Coordination

4.1 AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONTACTED DURING THE PRE-CONSULTATION PROCESS

Pre-consultation letters were sent out to city and state departments and community stakeholders to request input on environmental concerns, planning and permitting guidance, community outreach, and to identify potential issues or additional studies needed. A list of pre-consultation letter recipients is provided below.

COUNTY OF HAWAII

1) Department of Environmental Management
2) Department of Parks and Recreation
3) Police Department
4) Fire Department
5) Planning Department
6) Office of Housing and Community Development
7) Office of Sustainability, Climate, Equity & Resilience
8) Mass Transit Agency
9) Department of Water Supply

STATE OF HAWAII

10) Department of Transportation – Highways
11) DLNR Director's Office
12) DLNR Division of Aquatic Resources
13) DLNR Division of Forestry and Wildlife
14) DLNR Land Division
15) DLNR Commission of Water Resource Management
16) Office of Planning and Sustainable Development – CZM Program
17) State Historic Preservation Division
18) HDOH Director's Office
19) HDOH – Clean Air Branch
20) HDOH – Environmental Management Division, Clean Water Branch
21) Agricultural Resource Management Division

COMMUNITY:

22) Boy Scouts of America – Aloha Council (lessee)

FEDERAL AGENCIES

23) USACE Honolulu District

UTILITIES

24) Hawaiian Electric

LANDOWNERS AND COMMUNITY MEETING ATTENDEES:

25) George K. Makua
26) Kaniela Aiona
27) Jean T. Matsuyama
28) Thomas J. Mohbat
29) Charlotte M LVG De Reis Trust
30) Kyra K.I.L. Velez
31) Elise S TTEE Nakamura
32) Tensho-Kotai-Jingu-Kyo
33) Ryan K.A. Chinen
34) John David Branco, Sr.
35) Ana Rose P. Azevedo
36) Manny Simeon Dayoan
37) Eldelhard Roy Chandler
38) Elmer Kui Sung Lim III
39) Chun-Kai Huang
40) Larry Shingo Enriquez
41) Chad K. Pua
42) Dale Tokuuke
43) Stan Ahn
44) Laura Acasio
45) Richard Onishi
46) Herbert Aoki
47) Shelly Ogata
48) Jessica Valdez
49) Michael Brestovansky
50) Donna Shimizu
51) Lorraine Ornellas
52) Pino H.
53) Leslie Isemoto
54) Melvin Tanaka
55) Laurette Jardine
56) Clement A. Gusman
57) William M. Mitchell Jr.
58) Kele & Caley Coloma

4.2 PRE-CONSULTATION COMMENT LETTER SUMMARY

Pre-consultation letters were sent to the above listed groups and individuals on August 12, 2025. The pre-consultation period extended through September 12, 2025, and eleven responses were received. Summaries of these correspondences are documented in Table 7 below (following section 4.3). Full letter correspondence is available in Appendix D.

4.3 PUBLIC OUTREACH

A community meeting about the planning and design for the Four Mile Creek Bridge was held on July 6, 2023, by the DPW at Waiakeawaena Elementary School cafeteria. The meeting presented the project at the 15 percent design stage. At the end of the presentation, there was a question-and-answer session where attendees shared their input on the design. Some of the public suggestions included involving the local fire department for input into the turn design and purchasing an abandoned property adjacent to the Haihai Street right of way that could be used for widening and construction of a roundabout. Meeting minutes from the community meeting are included in Appendix E.

Table 7: Summary of Pre-Consultation Letters

Responder	Summary	Follow-up Actions
Ms. Paula Pua, landowner and resident of two parcels adjacent to construction	Questions regarding timeline and design alternatives and the County's property acquisition process. Comments regarding safety and traffic design, including interest in keeping the existing guardrail in front of her property.	Discussion meeting held on September 2, 2025 between the responder and the County Project Manager, Project Engineer, and Environmental Compliance team to answer questions. Traffic engineers will discuss existing guardrail as design progresses.
County Police Department	No concerns for traffic and/or public safety.	N/A
County DEM, Solid Waste Division	Offer to review Solid Waste section of the Draft EA.	Preliminary Solid Waste section was reviewed by DEM and suggested edits were incorporated into the Draft EA.
State Department of Transportation, District Engineer	Expressed concern that any redirection of the Four Mile Creek flow will impact the downstream Panaewa Bridge on Route 11, Kanoelehua Avenue.	Designers are working with the County Floodplain Managers on the design of the bridge and conveyance conditions.
State Department of Health, Clean Air Branch	Standard comments note that if construction/demolition may have potential asbestos and lead containing materials, provisions should be made.	Discussion about asbestos-containing materials and lead-based paint included in Section 2.1.7 - *Air Quality*.
State Department of Land and Natural Resources, Office of Conservation and Coastal Lands	OCCL requests the Draft EA describe in detail proposed work in the Conservation District and that the proposed plans clearly delineate the ROW and proposed work in the Conservation District.	Delineation maps prepared and included in the discussion of Conservation Districts in the Draft EA.
State Office of Planning and Sustainable Development	OPSD recommends the Draft EA generally discuss the technologies and best practices and other mitigation measures for the Proposed Action that would advance the implementation of the 2050 Sustainability Plan and discusses the CZM and Hawaii State Planning Acts.	Discussion regarding the 2050 Sustainability Plan, CZM Act, and Hawaii State Planning Act included in Section 3.2 - State Regulations, Permits, and Plans.
Hawaii District Land Division Office	No objections.	N/A
Commission on Water Resource Management	Recommends the use of BMPs for stormwater management and review by HDOH related to water quality.	BMPs for stormwater management will be included in the project design and an NPDES permit will be sought during construction and will be reviewed by HDOH.
State Department of Land and Natural Resources, Engineering Division	Noted that the project owner has the responsibility to research the Flood Hazard Zone designation of the project area.	The project area falls within the Special Flood Hazard Area (high-risk). Designers are working with the County Floodplain Managers on the bridge and conveyance design.
County Planning Department	Recommends Section 106 review, inclusion of discussion about stormwater pre- and post-project, encourages removal of invasive species and use of native species.	Discussions about stormwater and native/invasive species are included in the Draft EA (Section 2.2). As the proposed action is not a federal action, Section 106 review is not required, but Chapter 6E consultation will be coordinated with the SHPD.
County Department of Water Supply	Details the existing waterlines in the area, requests that plans be submitted to the Department for review and approval prior to construction.	Discussion of existing utilities in area added to Section 2.3.2, plans will be submitted to DWS for review and approval. Should lines need to be relocated, the applicant/contractor will be responsible for the cost.

5. Anticipated Determination and Findings

5.1 SIGNIFICANCE CRITERIA

In accordance with HRS Chapter 343 and HAR §11-200.1-19, the County conducted assessment of the Proposed Action based on an evaluation of project impacts in relation to the "Significance Criteria" specified in HAR §11-200.1-13. The Significance Criteria appear below in italics, followed by a discussion of the project in relation to the specific criterion. The nature of the project's potential impacts and committed mitigation measures is discussed in detail in Chapter 2. The discussion below summarizes the supporting rational of significance criteria used to determine whether the Proposed Action would have a significant impact on the environment:

(1) Irrevocably commit a natural, cultural, or historic resource:
A field survey (intended to assist with the project's compliance with HRS §6E-8 and HAR §13-275 in consultation with SHPD) concluded that the proposed project area was completely developed, no historic properties were documented, and no significant artifacts or features were encountered during the field inspection (Honua Consulting, 2025; Appendix C). The project will not irrevocably commit a natural, cultural or historic resource as discussed in Section 2.3.5 - *Cultural and Archaeological Resources*. SHPD concurs with DPW's effect determination of "Effect, with proposed mitigation commitments" for the demolition of the Four Mile Creek Bridge per HAR §13-275-7(a)(2). SHPD also concurs with the DPW's proposed mitigation commitments (detailed in Section 2.3.5.2.1). With implementation of these measures, the Proposed Action is not anticipated to cause irrevocable or substantially detrimental effects on natural, cultural, or historic resources.

(2) Curtail the range of beneficial uses of the environment:
The proposed project will not curtail beneficial uses of the environment. Although the bridge will be widened and require approximately 1.18 acres of Conservation Land to be converted to road ROW, the Proposed Action will improve safety for all users and enhance the existing transportation environment for vehicular, bicycle, and pedestrian users in the area. The increased bridge deck elevation will improve the bridge's resilience to flooding. Work outside of the new ROW limits will be required during construction but would be temporary and localized. Construction of the bridge is intended to be phased to maintain vehicle access along Kīlauea Avenue; with the current bridge remaining in service while the first half of the bridge is built, then that built one-lane bridge will open while the old bridge is demolished and rebuilt. Construction is anticipated to take two years. Upon completion, the surrounding areas will be restored to original conditions to the extent practicable. The replacement bridge will serve the same transportation function as the existing structure and, with the exception of a land acquisition of 1.18 acres, which will be converted to ROW (Section 2.1.2), will not introduce new land uses or modifications to access.

(3) Conflicts with the State's environmental policies or long-term environmental goals established by law:
The proposed project is consistent with the environmental goals and long-term objectives of the State, as demonstrated in this section and in Section 3.2.

(4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State:
The proposed project will not have an adverse effect on the economic or social welfare nor the cultural practices of the community or the State. The project will support and improve social welfare of the community by providing safer transportation thoroughfare and opportunity for multimodal

transportation. Additionally, traffic at the Haihai and Kilauea Street intersection will benefit from traffic signal installation.

The Proposed Action would have impacts on the historic Four Mile Creek Bridge, which would be mitigated under HRS Chapter 6E. The project would not adversely impact cultural resources or traditional or customary practices. See Section 2.3.5 for further discussion.

(5) Have a substantial adverse effect on public health:
The proposed project would not adversely affect public health. Construction-phase air and water quality impacts such as dust or sedimentation will be temporary and mitigated through the implementation of BMPs. Long-term air quality in the immediate area is expected to increase due to a reduction in car idling times.

(6) Involve adverse secondary impacts, such as population changes or effects on public facilities:
The proposed project is not expected to cause negative secondary impacts. The project aligns with the County's General Plan and transportation goals to achieve a transportation system that is consistent with and will accommodate planned growth by improving traffic roadways, sidewalks, and bike paths in the area. The project will improve traffic efficiency and help accommodate population growth of the area and improve public transportation facilities.

(7) Involve a substantial degradation of environmental quality:
The proposed project will not result in a substantial degradation of environmental quality. Temporary environmental impacts during construction will be mitigated by implementing construction BMPs and would not be significant. The project will not result in permanent adverse environmental conditions as demonstrated in Section 2.

(8) Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions:
DPW is in the design process for the *Safe Route to Waiakea Schools – Kilauea Avenue Project,* which plans to construct sidewalks and bike lanes along both sides of Kilauea Avenue for 1.5 miles between the Puainalo Street intersection and Haihai Street intersection, north of the project area. The south end of the project abuts with the north side of the Four Mile Creek project. The projects are part of DPW's commitment to the County General Plan's Transportation Goal (further discussion in Section 3.3.3) to expand the multimodal transportation system. These projects are not expected to have cumulative adverse impacts on the environment. The majority of construction will take place at different times without overlap. The SRTS project may begin construction as the Four Mile Creek Bridge improvements project is approaching completion, in which case the SRTS project will begin work from the Kawailani Street side to minimize cumulative effects. The cumulative effects of the two projects once completed will be an increase in multimodal transportation to support population increase and expansion, decrease in traffic idling times, and subsequent localized positive effect on air quality.

(9) Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat:
No State or Federally protected species or critical habitat was identified during a Biological Survey (Appendix B) conducted of the project area. The Proposed Action "may affect but is unlikely to adversely affect" the following IPaC-listed species during construction:

- **Ao** also known as Newell's shearwater (threatened);
- **Uau** also known as the Hawaiian petrel (endangered);
- **Ake Ake** also known as the band-rumped storm-petrel (endangered);
- **Aeo** also known as the Hawaiian stilt (endangered);
- **Alae keokeo** also known as the Hawaiian coot (endangered);
- **Koloa maoli** also known as the Hawaiian duck (endangered);
- **Nene** also known as the Hawaiian goose (threatened); and
- **Ōpeapea** also known as the Hawaiian hoary bat (endangered).

Neither alternative would require the permanent erection of in-stream structures that would affect aquatic species' use of the stream habitat. Neither alternative would have an effect on the Hawksbill sea turtle, also listed by IPaC. See Section 2.2 for further discussion.

(10) Have a substantial adverse effect on air or water quality or ambient noise levels:
Short-term impacts on air quality and ambient noise levels are anticipated to occur during construction but will be mitigated by contractor control measures. The contractor will be required to comply with all State or Federal air quality, water quality, and noise regulations and standards during construction. Water quality impacts will be mitigated through proper construction BMP techniques and compliance with applicable HDOH rules and regulations. The proposed project would not lead to any violations of State or National Ambient Air Quality Standards.

(11) Have a substantial adverse effect on or 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:
The proposed project is located in a flood plain. The current stream width beneath the bridge is narrower than the natural condition, as fill was placed in the stream during the construction of the original bridge. This Proposed Action would remove some of this fill, restoring the channel to more natural conveyance conditions.

(12) Have a substantial adverse effect on scenic vistas and view planes, during the day or night, identified in county or state plans or studies:
The proposed project is the reconstruction of an existing bridge and the improvements of approaching roadways to the bridge that would not affect any identified views / vistas. Consultation with SHPD will ensure that any historic characteristics of the bridge are appropriately preserved in the final project designs for the replacement bridge.

(13) Require substantial energy consumption or emit substantial greenhouse gases:
The Proposed Action would not result in substantial energy consumption. There may be a short-term increase in energy consumption during the project's construction; however, there are expected long-term energy benefits of improving traffic flow from widening the bridge and improvement of the intersection. The proposed project is not anticipated to increase vehicle traffic volume and is expected to reduce the ratio of cars in the vehicle mix (Appendix A). As such, the proposed project would not contribute to a long-term increase in vehicle emissions that impact air quality or emit substantial GHGs.

5.2 CONCLUSION

Through informed bridge design, impact avoidance and minimization actions, and proposed BMPs and mitigation measures, the analysis contained in this Draft EA has determined that project-related impacts would be mitigated to less than significant levels, such that the proposed Project would not result in significant adverse impacts.

Based on the information presented and examined in this document, the proposed project is not expected to produce significant adverse social, economic, cultural, or environmental impacts. Therefore, a Finding of No Significant Impact is anticipated, pursuant to HRS Chapter 343 and the provisions of HAR Subchapter 7 of §11-200.1.

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APPENDIX A
Traffic Impact Analysis Report

Memorandum

Date: May 30, 2023

To: Hawaii County

From: Consor Engineers

Subject: Four Mile Creek Bridge Traffic Analysis Results

Introduction

The Four Mile Creek Bridge in Hilo, Hawaii is a one-lane bridge located south of the intersection of Kilauea Avenue & Haihai Street that is currently being designed for replacement to construct a two-lane bridge. As part of the project, the intersection of Kilauea Avenue & Haihai Street is being evaluated to be reconstructed to include improvements for traffic operations and safety. The intersection is currently side-street-stop controlled with stop signs located on the Haihai Street (west leg) and Aumakua Gardens (east leg) approaches. Alternatives for evaluation for intersection improvements include a traffic signal and a roundabout. This technical memorandum describes the methodology and results from the traffic analysis of the Existing Conditions and Plus Project alternatives evaluation traffic analysis for a traffic signal and roundabout at Kilauea Avenue & Haihai Street.

Traffic Analysis & Alternatives Analysis

The traffic analysis methodology, traffic volumes, alternatives evaluation, and traffic analysis results are described in this section.

Traffic Analysis Methodology

A traffic analysis was completed to determine the impacts of the proposed improvements at the intersection of Kilauea Avenue & Haihai Street. The transportation operations analysis addressed unsignalized and signalized intersection operations using the procedures and methodologies contained in the Highway Capacity Manual (HCM) for the weekday and AM and PM peak hour traffic operations. Study intersection operations were evaluated using level of service calculations as analyzed in the Synchro software for the existing conditions and traffic signal alternative. SIDRA was used to evaluate the roundabout alternative. To measure and describe the operational status of the intersection, transportation engineers and planners commonly use a grading system called level of service (LOS) and delay. LOS characterizes the operational conditions of an intersections traffic flow; ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceed the design capacity, resulting in long queues and delays).

Traffic Volumes

Our team obtained traffic data including Peak Hour Turning Movement Counts (TMC) at Kilauea Avenue & Haihai Street and speed, daily traffic volumes, and vehicle classification data at each intersection approach. Figure 1 displays the existing traffic volumes at the intersection of study. To determine the 2045 traffic volumes, the existing traffic volumes were increased by an annual growth rate of six percent (6%) in the AM and PM peak hours. The six percent growth rate was provided by the County of Hawaii. The resulting volumes were very high and atypical for a minor arterial. The United States Census Bureau records a historical population data for 2010 (population 43,263) and 2020 (population 44,186). There was an increase of two percent (2%) over the ten-year period. This translates to an average annual growth rate of 0.2% per year. Hilo has seen its population increase around 6% over the last few years. However, that growth may not be sustainable at that rate over the 20-year study period as part of the analysis. As a result, a range of growth rates were used to project 2045 traffic volumes to understand all potential levels of population growth on the intersection. Project growth rates include one, two, and six percent.

Figure 2, Figure 3, and Figure 4 display the 2045 traffic volumes at the study intersection for one, two and six percent growth rates respectively.

Figure 1. Existing Traffic Volumes

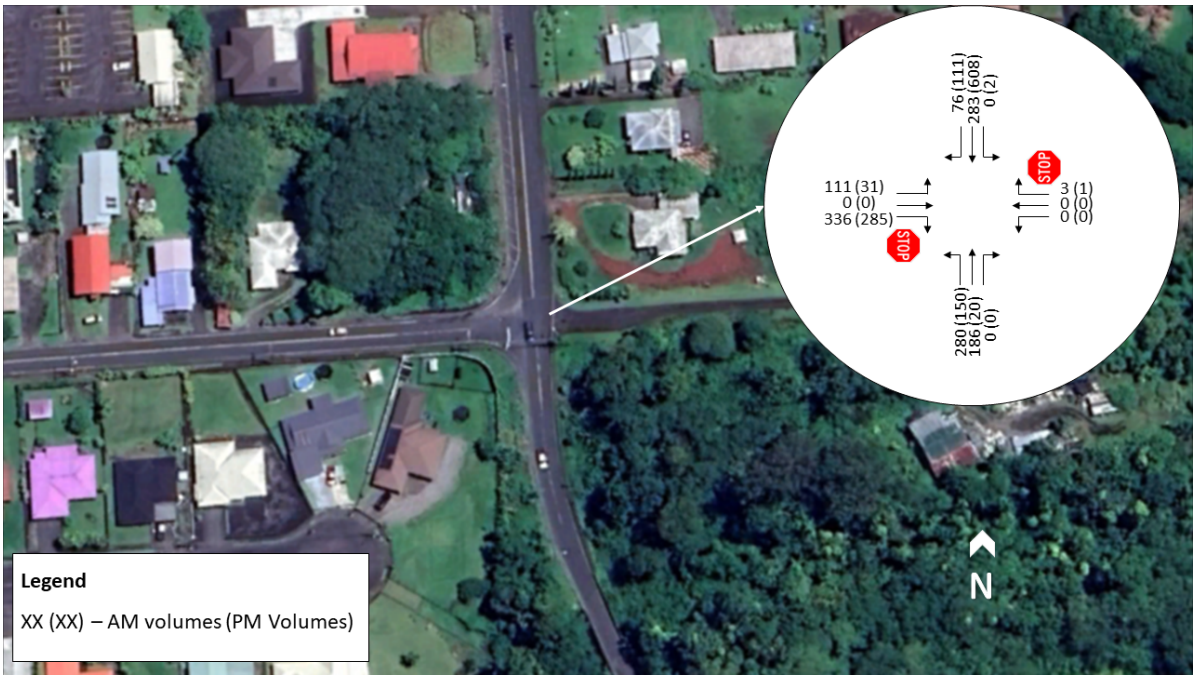


Figure 2. Future (2045) Traffic Volumes- 1% growth rate

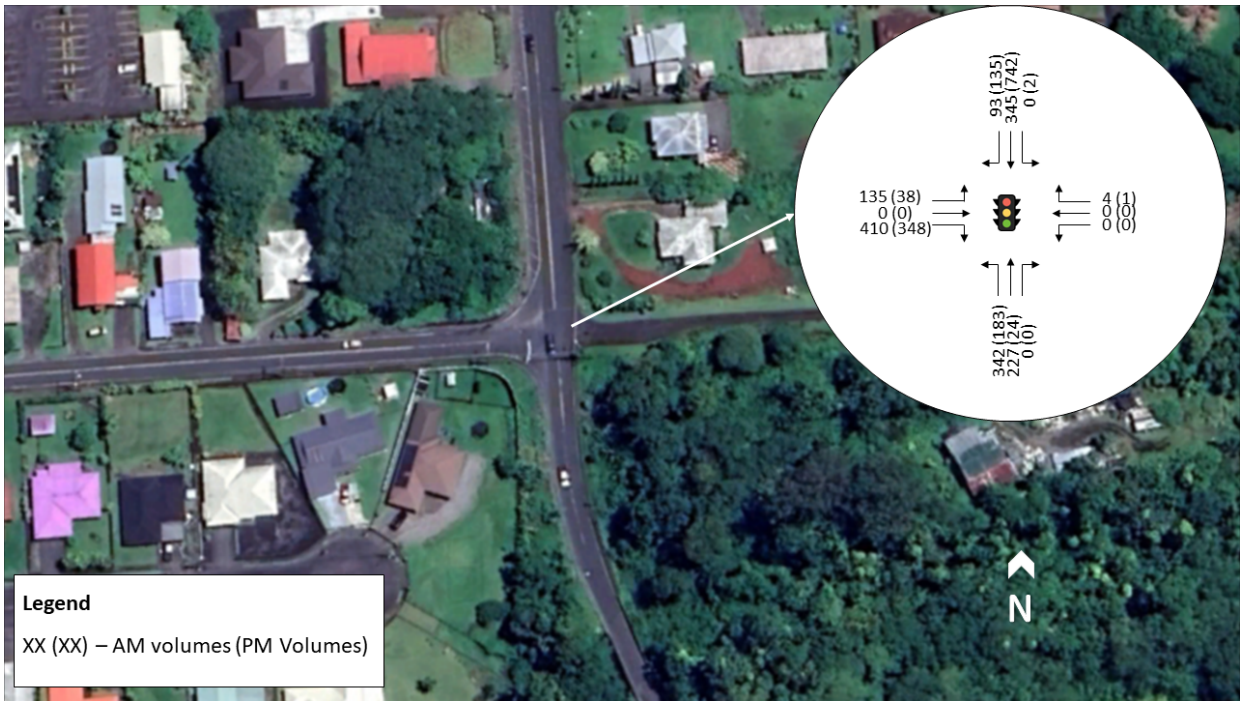


Figure 3: Future (2045) Traffic Volumes- 2% growth rate

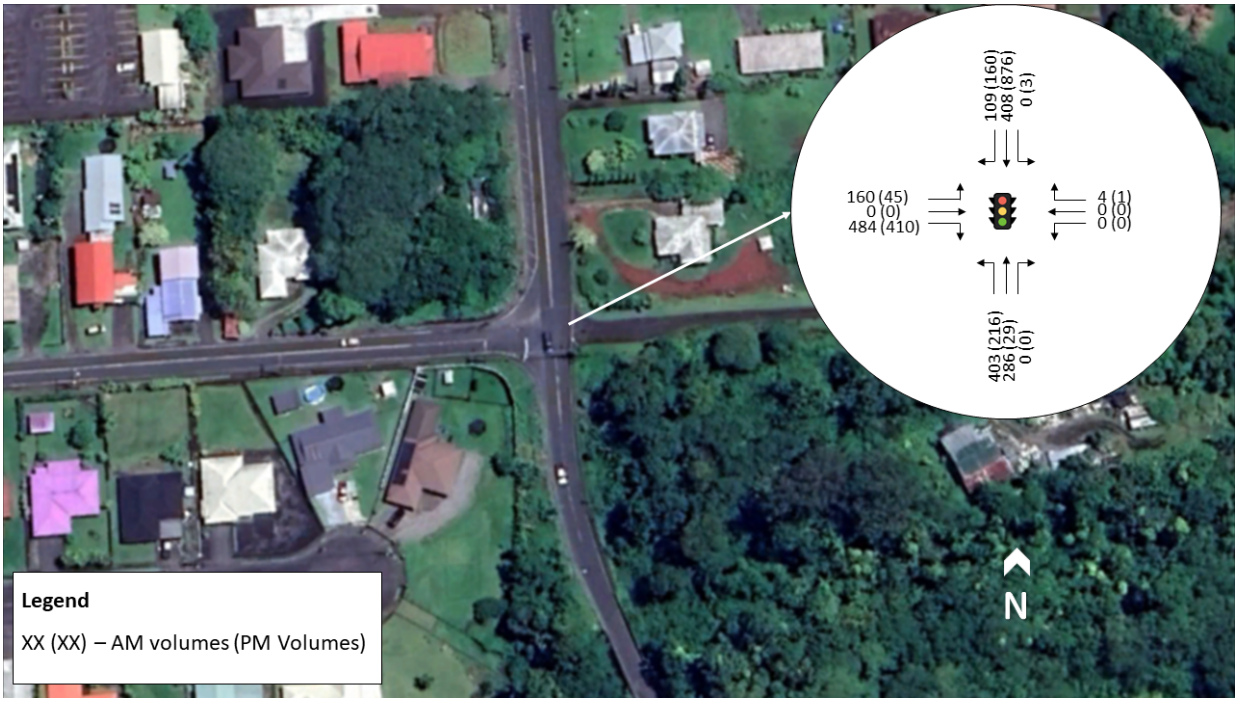
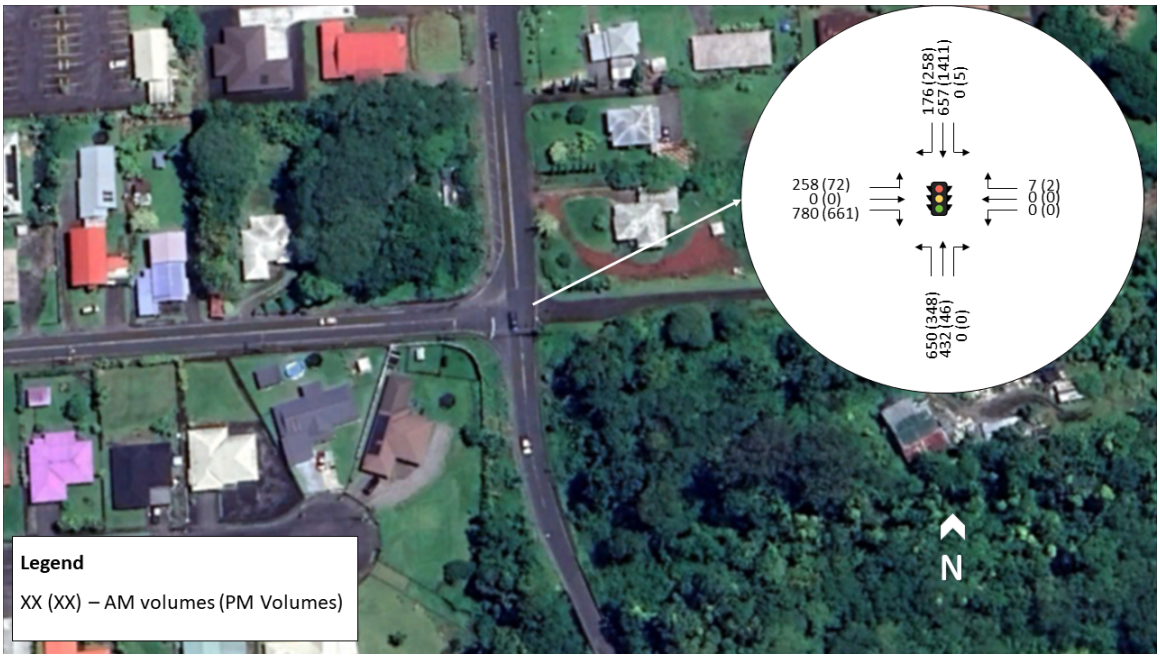


Figure 4: Future (2045) Traffic Volumes- 6% growth rate



Existing Conditions Traffic Analysis Results

This section describes the traffic analysis results at the intersection of Kilauea Avenue & Haihai Street under Existing Conditions and Plus Project scenarios. Appendix B displays the detailed traffic analysis results.

Table 1. Kilauea Avenue & Haihai Street Traffic Analysis Results Summary

	Existing AM		Existing PM	
	Delay	LOS	Delay	LOS
Eastbound	178.9	F	51.8	F
Westbound	9.2	A	8.4	A
Northbound	5.4	A	10.2	B
Southbound	0.0	A	7.2	A
Intersection	64.7	F	14.8	B

The intersection is operating poorly in both the AM and PM peak periods. Specifically, the eastbound approach experiences significant delays. The southbound approach is displaying as 0.0 seconds of delay because there are zero left-turning vehicles in the AM peak volumes.

Alternatives Analysis

Our team evaluated two Plus Project alternative designs: a traffic signal and a roundabout. Alternate lane configurations for each alternative were evaluated and level of service by movement, approach, and queue lengths were used to determine recommended lane configurations for each alternative. The lane configurations for the preferred alternatives are as follows:

- Traffic Signal
  - Northbound approach: one exclusive left-turn lane, one shared through/right lane
  - Southbound approach: one shared left/through/right lane
  - Eastbound approach: one shared left/through/right lane
  - Westbound approach (driveway): one shared left/through/right lane
- Roundabout
  - Northbound approach: one shared left/through/right lane
  - Southbound approach: one shared left/through/right lane
  - Eastbound approach: one shared left/through/right lane
  - Westbound approach (driveway): one shared left/through/right lane

TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis was conducted utilizing guidelines and methodology provided in the Federal Highway Administrations (FHWA) Manual on Uniform Traffic Control Devices (MUTCD, 2009 Edition). Under Chapter 4C: Traffic Control Signal Needs Studies in the MUTCD, there are nine warrants for installation of traffic control signals. Three of the nine warrants were evaluated: Warrant 1-Eight-Hour Vehicular Volume, Warrant 2-Four-Hour Vehicular Volume, and Warrant 3-Peak Hour. Existing traffic volumes were used to analyze the signal warrants. Table 2 displays the results from the traffic signal warrant analysis.

Table 2. MUTCD Signal Warrant Summary

Warrant Analyzed	Warrant Met?
Warrant 1: Eight-Hour Vehicular Volume	Yes
Warrant 2: Four-Hour Vehicular Volume	Yes
Warrant 3: Peak Hour	Yes

Warrant 1: Eight-Hour Vehicular Volume

Warrant 1: Eight-Hour Vehicular Volume (MUTCD Section 4C.02) is met when:

A. The vehicles per hour given in both of the 100 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; or
B. The vehicles per hour given in both of the 100 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

In applying each condition, the major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these 8 hours.

Table 3 displays the volume thresholds from the MUTCD. Traffic volumes are above the listed in the table for Condition A; thus, Warrant 1 is met.

Table 3. Warrant 1 Volume Conditions (MUTCD Table 4C-1)

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112
Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

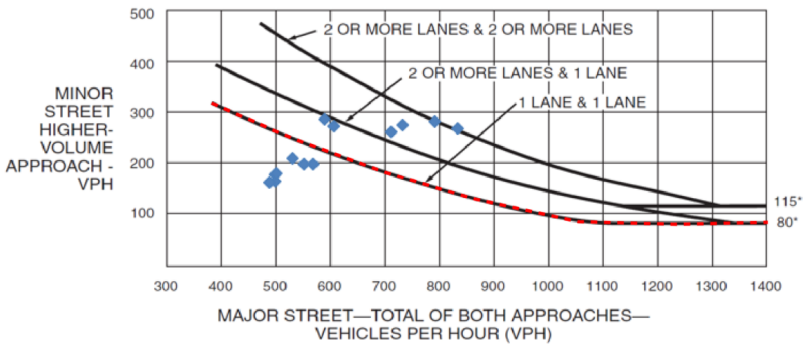
[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Warrant 2: Four-Hour Vehicular Volume

Warrant 2: Four-Hour Vehicular Volume (MUTCD Section 4C.03) is met when the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in from MUTCD Figure 4C-1. Figure 5 displays the results from Warrant 2. More than four points fall above the '1 lane & 1 lane' line and as a result Warrant 2 is met.

Figure 5. Four-Hour Vehicular Volume Warrant Results

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume

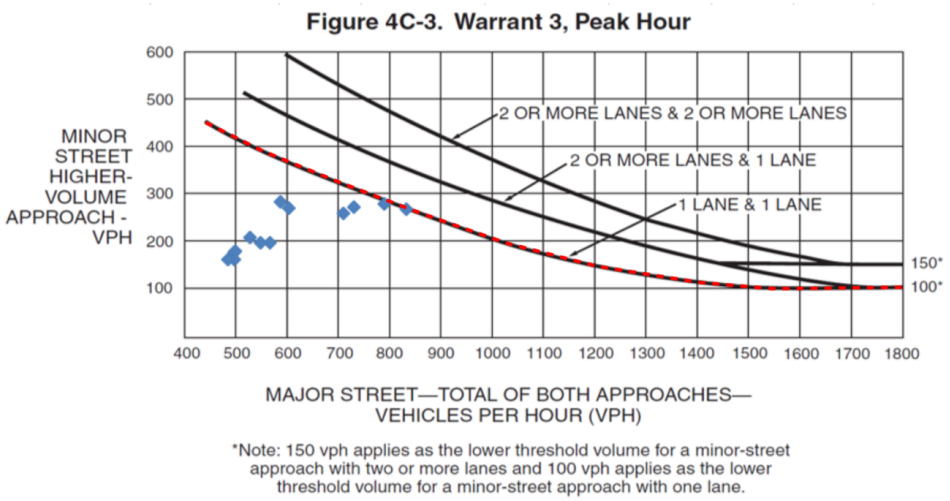


*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3: Peak Hour

Warrant 3: Peak Hour (MUTCD Section 4C.04) is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. Warrant 3 is met when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in MUTCD Figure 4C-3 for the existing combination of approach lanes. Figure 6 displays the results from Warrant 3. One point falls along the '1 lane & 1 lane' line and as a result Warrant 3 is met.

Figure 6. Peak Hour Vehicular Volume Warrant Results



Existing Plus Project Traffic Analysis Results

Existing traffic volumes were utilized to determine the impacts of a traffic signal and roundabout. Table 4 and Table 5 display the results from the traffic signal alternative and roundabout alternative, respectively. The design vehicle utilized for the roundabout analysis is the SU-40. In both the traffic signal and roundabout examples the eastbound delay in the AM and PM peak improve significantly. The overall intersection delay improves significantly in the AM peak period.

Table 4. Kilauea Avenue & Haihai Street Existing Volumes Plus Traffic Signal Alternative Results

	AM Peak				PM Peak			
	Existing AM		Proposed Signal		Existing PM		Proposed Signal	
Approach	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound	178.9	F	27.0	C	51.8	F	19.1	B
Westbound	9.2	A	13.8	B	8.4	A	13.9	B
Northbound	5.4	A	17.2	B	10.2	B	11.7	B
Southbound	0.0	A	11.1	B	7.2	A	14.5	B
Intersection	**64.7**	**F**	**18.6**	**B**	**14.8**	**B**	**15.3**	**B**

Table 5. Kilauea Avenue & Haihai Street Existing Volumes Plus Roundabout Alternative Results

Approach	AM Peak				PM Peak			
	Existing AM		Proposed Roundabout		Existing PM		Proposed Roundabout	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound	178.9	F	9.0	A	51.8	F	12.0	B
Westbound	9.2	A	4.9	A	8.4	A	3.3	A
Northbound	5.4	A	7.0	A	10.2	B	3.9	A
Southbound	0.0	A	7.9	A	7.2	A	12.0	B
Intersection	**64.7**	**F**	**8**	**A**	**14.8**	**B**	**10.9**	**B**

Future Year (2045) Plus Project Traffic Analysis Results

Future year (2045) traffic volumes were projected using 1%, 2%, and 6% annual growth rates. Table 6 displays the results for each annual growth rate for the traffic signal. The traffic signal operates at LOS C and LOS D under future conditions for the 1% and 2% annual growth rates, respectively. However, the overall intersection and several approaches begin to operate poorly at LOS F under future conditions for the 6% annual growth rate. Table 7 displays the results for each annual growth rate for the roundabout. The roundabout operates at LOS B under future conditions for the 1% and 2% annual growth rates. However, the intersection begins to operate poorly under future conditions for the 6% annual growth rates.

For both the traffic signal and roundabout alternative, it is challenging to balance the demand between the northbound/southbound traffic and conflicting eastbound traffic due to high traffic volumes under the 6% growth rate. Thus, those movements experience higher delay as traffic volumes increase.

Table 6. Kilauea Avenue & Haihai Street Future Year 2045 Volumes Plus Traffic Signal Alternative Results

Approach	AM Peak						PM Peak					
	1% growth rate		2% growth rate		6% growth rate		1% growth rate		2% growth rate		6% growth rate	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound	30.0	C	50.6	D	513.8	F	54.2	D	275.6	F	458.3	F
Westbound	14.2	B	20.4	C	43.0	D	24.9	C	40.5	D	45.3	D
Northbound	24.5	C	44.6	D	117.3	F	16.4	B	34.9	C	262.7	F
Southbound	11.4	B	57.8	E	145.5	F	43.0	D	33.1	C	303.0	F
Intersection	22.7	C	50.4	D	264.1	F	42.2	D	96.8	F	337.8	F

Table 7. Kilauea Avenue & Haihai Street Future Year 2045 Volumes Plus Roundabout Alternative Results

Approach	AM Peak						PM Peak					
	1% growth rate		2% growth rate		6% growth rate		1% growth rate		2% growth rate		6% growth rate	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound	12.6	B	20.2	C	195.2	F	20.1	C	45.8	E	159.5	F
Westbound	5.7	A	6.5	A	10.4	B	3.4	A	3.6	A	4.3	A
Northbound	8.7	A	11.1	B	50.2	F	4.3	A	4.6	A	5.9	A
Southbound	10.4	B	14.3	B	172.9	F	20.4	C	50.0	F	415.0	F
Intersection	10.5	B	15.2	B	135.4	F	18.0	C	42.4	E	290.0	F

Summary and Recommendation

The intersection of Kilauea Avenue & Haihai Street was analyzed for operational improvements as part of the Four Mile Creek Bridge widening project in Hilo, Hawaii. The intersection is currently side-street-stop controlled and was evaluated improvements to incorporate into the design of the Four Mile Creek Bridge project. A traffic signal warrant analysis was conducted in compliance with guidance provided in the MUTCD and it was determined that the intersection met traffic signal warrants. Both a traffic signal and a roundabout were analyzed as part of the traffic analysis. The traffic signal and roundabout were analyzed using existing traffic volumes and future year (2045) volumes. Future year volumes were projected using a 1%, 2%, and 6% growth rate. The County of Hawaii provided a 6% growth rate due to the significant growth they have seen over the last few years. Historically, growth rates were found to be 0.2% per year based on US Census data. 6% annual growth rate may not be sustainable for 20 years into the future and as a result 1% and 2% annual growth rates were analyzed in addition to the 6% annual growth rate to analyze a range of potential population growth trends. It was determined that the traffic signal and roundabout operate acceptably under existing plus project and future conditions for the 1% and 2% growth rate. Both alternatives operate poorly under future conditions with the 6% growth rate.

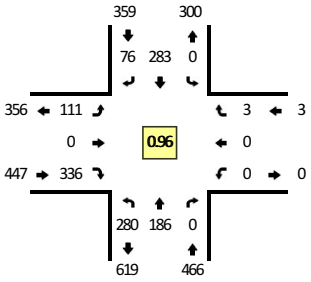
The roundabout produces slightly better delay results than the traffic signal. However, due to the right-of-way constraints, it is recommended that the intersection of Kilauea Avenue & Haihai Street be upgraded to a traffic signal. Our analysis assumed one lane approaches in the eastbound, westbound, and southbound directions and a through/right and left-turn storage lane in the northbound direction.

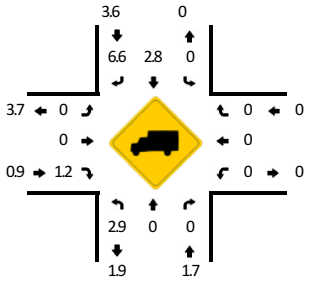
Appendix A – Traffic Counts

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

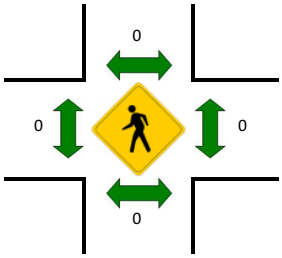
LOCATION: Kilauea Ave -- Haihai St/Aumakua Gardens Entrance | **QC JOB #:** 16106301
CITY/STATE: Hilo, HI | **DATE:** Wed, Mar 8 2023

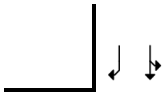
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

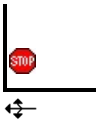


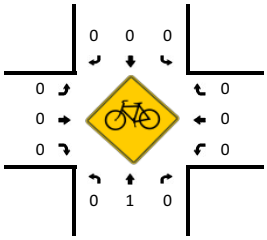


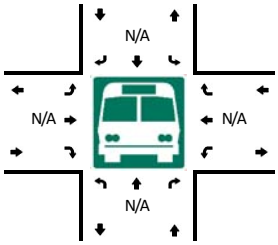
Quality Counts
DATA THAT DRIVES COMMUNITIES

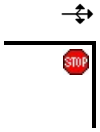


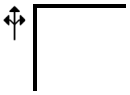


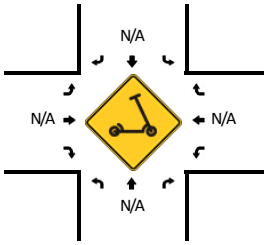












15-Min Count Period Beginning At	Kilauea Ave (Northbound)				Kilauea Ave (Southbound)				Haihai St/Aumakua Gardens Entrance (Eastbound)				Haihai St/Aumakua Gardens Entrance (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	75	36	0	0	0	59	9	0	25	0	97	0	0	0	0	0	301	
7:15 AM	60	41	0	0	0	93	23	0	28	0	84	0	0	0	2	0	331	
7:30 AM	67	49	0	0	0	69	26	0	31	0	86	0	0	0	1	0	329	
7:45 AM	78	60	0	0	0	62	18	0	27	0	69	0	0	0	0	0	314	1275
8:00 AM	81	49	1	0	0	58	21	0	12	0	44	0	0	2	0	0	268	1242
8:15 AM	67	32	0	0	0	47	13	0	15	0	38	0	0	0	0	0	212	1123
8:30 AM	48	32	0	0	0	47	17	0	14	0	36	0	0	0	0	0	194	988
8:45 AM	70	35	0	0	0	35	21	0	10	0	30	0	0	0	1	0	202	876

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	240	164	0	0	0	372	92	0	112	0	336	0	0	0	8	0	1324
Heavy Trucks	8	0	0		0	0	8		0	0	4		0	0	0		20
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/15/2023 11:05 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

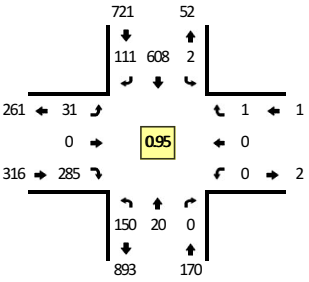
Type of peak hour being reported: Intersection Peak

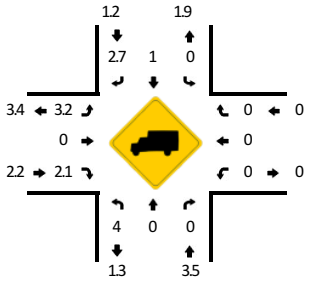
Method for determining peak hour: Total Entering Volume

LOCATION: Kilauea Ave -- Haihai St/Aumakua Gardens Entrance
CITY/STATE: Hilo, HI

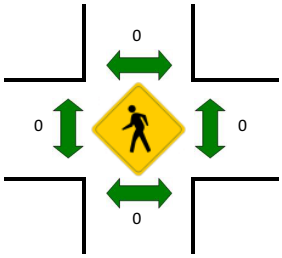
QC JOB #: 16106302
DATE: Wed, Mar 8 2023

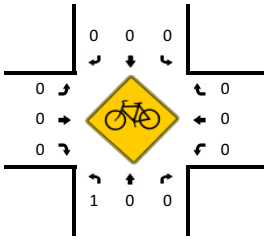
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

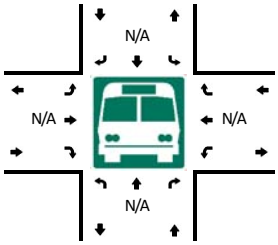


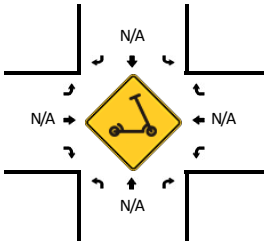


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	Kilauea Ave (Northbound)				Kilauea Ave (Southbound)				Haihai St/Aumakua Gardens Entrance (Eastbound)				Haihai St/Aumakua Gardens Entrance (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	32	9	0	0	0	150	27	0	10	0	74	0	0	0	0	0	302	
4:15 PM	45	5	0	0	0	137	38	0	4	0	88	0	0	0	0	0	317	
4:30 PM	37	5	0	0	0	166	21	0	7	0	56	0	0	0	1	0	293	
4:45 PM	36	1	0	0	2	155	25	0	10	0	67	0	0	0	0	0	296	1208
5:00 PM	33	1	0	0	0	152	31	0	4	0	72	0	0	0	0	0	293	1199
5:15 PM	24	6	0	0	0	170	27	0	7	0	79	0	0	0	0	0	313	1195
5:30 PM	19	5	0	0	0	137	19	0	11	0	70	0	0	0	0	0	261	1163
5:45 PM	28	5	0	0	0	90	28	0	10	0	54	0	0	0	0	0	215	1082

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	20	0	0	0	548	152	0	16	0	352	0	0	0	0	0	1268
Heavy Trucks	0	0	0		0	0	8		0	0	4		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/15/2023 11:05 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of report: Tube Count - Volume Data

LOCATION: Kilauea Ave north of Haihai St
QC JOB #: 16106305
SPECIFIC LOCATION:
DIRECTION: SB
CITY/STATE: Hilo, HI
DATE: Mar 8 2023 - Mar 9 2023

Start Time	Mon	Tue	Wed 8 Mar 23	Thu 9 Mar 23	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			31	27		29			29	
01:00 AM			27	29		28			28	
02:00 AM			19	16		18			18	
03:00 AM			8	10		9			9	
04:00 AM			16	22		19			19	
05:00 AM			49	52		51			51	
06:00 AM			208	199		204			204	
07:00 AM			**328**	**341**		**335**			**335**	
08:00 AM			248	254		251			251	
09:00 AM			238	284		261			261	
10:00 AM			311	262		287			287	
11:00 AM			327	311		319			319	
12:00 PM			355	364		360			360	
01:00 PM			442	357		400			400	
02:00 PM			551	506		529			529	
03:00 PM			585	619		602			602	
04:00 PM			**684**	**666**		**675**			**675**	
05:00 PM			513	498		506			506	
06:00 PM			411	438		425			425	
07:00 PM			334	304		319			319	
08:00 PM			210	174		192			192	
09:00 PM			164	121		143			143	
10:00 PM			102	78		90			90	
11:00 PM			72	43		58			58	
Day Total			6233	5975		6110			6110	
% Weekday Average			102%	97.8%						
% Week Average			102%	97.8%		100%				
AM Peak Volume			7:00 AM 328	7:00 AM 341		7:00 AM 335			7:00 AM 335	
PM Peak Volume			4:00 PM 684	4:00 PM 666		4:00 PM 675			4:00 PM 675	

Comments:

Report generated on 3/15/2023 9:03 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Volume Data

LOCATION: Haihai St west of Kilauea Ave
QC JOB #: 16106304
SPECIFIC LOCATION:
DIRECTION: EB
CITY/STATE: Hilo, HI
DATE: Mar 8 2023 - Mar 9 2023

Start Time	Mon	Tue	Wed 8 Mar 23	Thu 9 Mar 23	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			20	15		18			18	
01:00 AM			10	14		12			12	
02:00 AM			15	12		14			14	
03:00 AM			16	11		14			14	
04:00 AM			27	26		27			27	
05:00 AM			79	66		73			73	
06:00 AM			179	194		187			187	
07:00 AM			**260**	**235**		**248**			**248**	
08:00 AM			198	184		191			191	
09:00 AM			164	187		176			176	
10:00 AM			163	167		165			165	
11:00 AM			180	159		170			170	
12:00 PM			209	195		202			202	
01:00 PM			**284**	204		244			244	
02:00 PM			274	303		289			289	
03:00 PM			280	252		266			266	
04:00 PM			268	252		260			260	
05:00 PM			272	**308**		**290**			**290**	
06:00 PM			198	200		199			199	
07:00 PM			196	172		184			184	
08:00 PM			117	114		116			116	
09:00 PM			75	92		84			84	
10:00 PM			52	53		53			53	
11:00 PM			28	38		33			33	
Day Total			3564	3453		3515			3515	
% Weekday Average			101.4%	98.2%						
% Week Average			101.4%	98.2%		100%				
AM Peak Volume			7:00 AM 260	7:00 AM 235		7:00 AM 248			7:00 AM 248	
PM Peak Volume			1:00 PM 284	5:00 PM 308		5:00 PM 290			5:00 PM 290	

Comments:

Report generated on 3/15/2023 9:03 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Volume Data

LOCATION: Kilauea Ave south of Haihai St | **QC JOB #:** 16106303

SPECIFIC LOCATION: | **DIRECTION:** NB

CITY/STATE: Hilo, HI | **DATE:** Mar 7 2023 - Mar 9 2023

Start Time	Mon	Tue 7 Mar 23	Wed 8 Mar 23	Thu 9 Mar 23	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM			13	11		12			12	
01:00 AM			4	3		4			4	
02:00 AM			12	8		10			10	
03:00 AM			26	19		23			23	
04:00 AM			50	51		51			51	
05:00 AM			161	140		151			151	
06:00 AM			280	315		298			298	
07:00 AM			**364**	**397**		**381**			**381**	
08:00 AM			314	324		319			319	
09:00 AM			230	246		238			238	
10:00 AM			194	210		202			202	
11:00 AM			181	184		183			183	
12:00 PM			165	179		172			172	
01:00 PM			**195**	188		192			192	
02:00 PM			187	**227**		**207**			**207**	
03:00 PM		**194**	191			193			193	
04:00 PM		165	158			162			162	
05:00 PM		89	113			101			101	
06:00 PM		120	135			128			128	
07:00 PM		92	88			90			90	
08:00 PM		67	82			75			75	
09:00 PM		58	46			52			52	
10:00 PM		34	40			37			37	
11:00 PM		13	32			23			23	
Day Total		832	3261	2502		3304			3304	
% Weekday Average		25.2%	98.7%	75.7%						
% Week Average		25.2%	98.7%	75.7%		100%				
AM Peak Volume		12:00 AM	7:00 AM 364	7:00 AM 397		7:00 AM 381			7:00 AM 381	
PM Peak Volume		3:00 PM 194	1:00 PM 195	2:00 PM 227		2:00 PM 207			2:00 PM 207	

Comments:

Report generated on 3/15/2023 10:15 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Appendix B – Synchro and SIDRA Reports

Synchro

Existing Conditions

Intersection	
Int Delay, s/veh	64.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	111	0	336	0	0	3	280	186	0	0	283	76
Future Vol, veh/h	111	0	336	0	0	3	280	186	0	0	283	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
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	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	1	0	0	0	3	0	0	0	3	7
Mvmt Flow	116	0	350	0	0	3	292	194	0	0	295	79

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1115	1113	335	1288	1152	194	374	0	0	194	0	0
Stage 1	335	335	-	778	778	-	-	-	-	-	-	-
Stage 2	780	778	-	510	374	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.21	7.1	6.5	6.2	4.13	-	-	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	3.309	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	187	210	709	142	199	853	1179	-	-	1391	-	-
Stage 1	683	646	-	392	410	-	-	-	-	-	-	-
Stage 2	391	410	-	550	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	152	709	57	144	853	1179	-	-	1391	-	-
Mov Cap-2 Maneuver	146	152	-	57	144	-	-	-	-	-	-	-
Stage 1	493	646	-	283	296	-	-	-	-	-	-	-
Stage 2	281	296	-	278	621	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	178.9	9.2	5.4	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1179	-	-	362	853	1391	-	-
HCM Lane V/C Ratio	0.247	-	-	1.286	0.004	-	-	-
HCM Control Delay (s)	9.1	0	-	178.9	9.2	0	-	-
HCM Lane LOS	A	A	-	F	A	A	-	-
HCM 95th %tile Q(veh)	1	-	-	21.2	0	0	-	-

Intersection	
Int Delay, s/veh	14.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	0	285	0	0	1	150	20	0	2	608	111
Future Vol, veh/h	31	0	285	0	0	1	150	20	0	2	608	111
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	0	2	0	0	0	4	0	0	0	1	3
Mvmt Flow	33	0	300	0	0	1	158	21	0	2	640	117

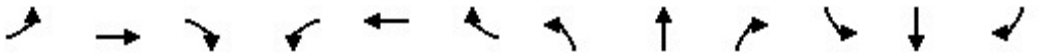
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1041	1040	699	1190	1098	21	757	0	0	21	0	0
Stage 1	703	703	-	337	337	-	-	-	-	-	-	-
Stage 2	338	337	-	853	761	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.5	6.22	7.1	6.5	6.2	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4	3.318	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	207	232	440	166	215	1062	845	-	-	1608	-	-
Stage 1	427	443	-	681	645	-	-	-	-	-	-	-
Stage 2	674	645	-	357	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	177	188	440	45	174	1062	845	-	-	1608	-	-
Mov Cap-2 Maneuver	177	188	-	45	174	-	-	-	-	-	-	-
Stage 1	346	442	-	552	523	-	-	-	-	-	-	-
Stage 2	546	523	-	113	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51.8	8.4	9	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	845	-	-	384	1062	1608	-	-
HCM Lane V/C Ratio	0.187	-	-	0.866	0.001	0.001	-	-
HCM Control Delay (s)	10.2	0	-	51.8	8.4	7.2	0	-
HCM Lane LOS	B	A	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	8.4	0	0	-	-

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/01/2023



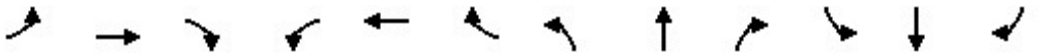
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	0	285	0	0	1	150	20	0	2	608	111
Future Volume (veh/h)	31	0	285	0	0	1	150	20	0	2	608	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1900	1900	1900	1841	1900	1900	1900	1885	1856
Adj Flow Rate, veh/h	33	0	300	0	0	1	158	21	0	2	640	117
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	0	2	0	0	0	4	0	0	0	1	3
Cap, veh/h	101	18	376	0	0	417	394	45	0	72	812	148
Arrive On Green	0.26	0.00	0.26	0.00	0.00	0.26	0.52	0.52	0.00	0.52	0.52	0.52
Sat Flow, veh/h	89	71	1451	0	0	1610	497	85	0	1	1551	283
Grp Volume(v), veh/h	333	0	0	0	0	1	179	0	0	759	0	0
Grp Sat Flow(s),veh/h/ln	1610	0	0	0	0	1610	582	0	0	1834	0	0
Q Serve(g_s), s	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.7	0.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	17.0	0.0	0.0
Prop In Lane	0.10		0.90	0.00		1.00	0.88		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	496	0	0	0	0	417	438	0	0	1031	0	0
V/C Ratio(X)	0.67	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.74	0.00	0.00
Avail Cap(c_a), veh/h	790	0	0	0	0	716	438	0	0	1031	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.5	0.0	0.0	0.0	0.0	13.9	8.9	0.0	0.0	9.8	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	6.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	0.0	0.0	0.0	13.9	11.7	0.0	0.0	14.5	0.0	0.0
LnGrp LOS	B	A	A	A	A	B	B	A	A	B	A	A
Approach Vol, veh/h		333			1			179			759	
Approach Delay, s/veh		19.1			13.9			11.7			14.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.0		18.6		32.0		18.6				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		26.5		22.5		26.5		22.5				
Max Q Clear Time (g_c+I1), s		16.4		11.7		19.0		2.0				
Green Ext Time (p_c), s		1.1		1.5		3.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/01/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	336	0	0	3	280	186	0	0	283	76
Future Volume (veh/h)	111	0	336	0	0	3	280	186	0	0	283	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1900	1856	1900	1900	1900	1856	1796
Adj Flow Rate, veh/h	116	0	350	0	0	3	292	194	0	0	295	79
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	0	3	0	0	0	3	7
Cap, veh/h	179	23	380	0	0	515	370	210	0	0	698	187
Arrive On Green	0.32	0.00	0.32	0.00	0.00	0.32	0.50	0.50	0.00	0.00	0.50	0.50
Sat Flow, veh/h	323	70	1188	0	0	1610	551	425	0	0	1410	378
Grp Volume(v), veh/h	466	0	0	0	0	3	486	0	0	0	0	374
Grp Sat Flow(s),veh/h/ln	1582	0	0	0	0	1610	975	0	0	0	0	1788
Q Serve(g_s), s	13.7	0.0	0.0	0.0	0.0	0.1	21.5	0.0	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	16.9	0.0	0.0	0.0	0.0	0.1	29.5	0.0	0.0	0.0	0.0	8.0
Prop In Lane	0.25		0.75	0.00		1.00	0.60		0.00	0.00		0.21
Lane Grp Cap(c), veh/h	582	0	0	0	0	516	580	0	0	0	0	885
V/C Ratio(X)	0.80	0.00	0.00	0.00	0.00	0.01	0.84	0.00	0.00	0.00	0.00	0.42
Avail Cap(c_a), veh/h	593	0	0	0	0	527	580	0	0	0	0	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	0.0	0.0	13.8	18.0	0.0	0.0	0.0	0.0	9.6
Incr Delay (d2), s/veh	7.6	0.0	0.0	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0	0.0	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	0.0	0.0	0.0	13.8	31.6	0.0	0.0	0.0	0.0	11.1
LnGrp LOS	C	A	A	A	A	B	C	A	A	A	A	B
Approach Vol, veh/h		466			3			486			374	
Approach Delay, s/veh		27.0			13.8			31.6			11.1	
Approach LOS		C			B			C			B	

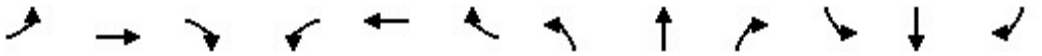
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		24.6		35.0		24.6				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		29.5		19.5		29.5		19.5				
Max Q Clear Time (g_c+I1), s		31.5		18.9		10.0		2.1				
Green Ext Time (p_c), s		0.0		0.2		2.4		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

Existing Conditions + Plus Project

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/01/2023



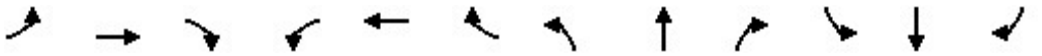
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	0	336	0	0	3	280	186	0	0	283	76
Future Volume (veh/h)	111	0	336	0	0	3	280	186	0	0	283	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1900	1856	1900	1900	1900	1856	1796
Adj Flow Rate, veh/h	116	0	350	0	0	3	292	194	0	0	295	79
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	0	3	0	0	0	3	7
Cap, veh/h	179	23	380	0	0	515	483	941	0	0	698	187
Arrive On Green	0.32	0.00	0.32	0.00	0.00	0.32	0.50	0.50	0.00	0.00	0.50	0.50
Sat Flow, veh/h	323	70	1188	0	0	1610	1001	1900	0	0	1410	378
Grp Volume(v), veh/h	466	0	0	0	0	3	292	194	0	0	0	374
Grp Sat Flow(s),veh/h/ln	1582	0	0	0	0	1610	1001	1900	0	0	0	1788
Q Serve(g_s), s	13.7	0.0	0.0	0.0	0.0	0.1	15.7	3.4	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	16.9	0.0	0.0	0.0	0.0	0.1	23.6	3.4	0.0	0.0	0.0	8.0
Prop In Lane	0.25		0.75	0.00		1.00	1.00		0.00	0.00		0.21
Lane Grp Cap(c), veh/h	582	0	0	0	0	516	483	941	0	0	0	885
V/C Ratio(X)	0.80	0.00	0.00	0.00	0.00	0.01	0.60	0.21	0.00	0.00	0.00	0.42
Avail Cap(c_a), veh/h	593	0	0	0	0	527	483	941	0	0	0	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	0.0	0.0	13.8	17.1	8.5	0.0	0.0	0.0	9.6
Incr Delay (d2), s/veh	7.6	0.0	0.0	0.0	0.0	0.0	5.5	0.5	0.0	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	0.0	0.0	0.0	0.0	3.8	1.3	0.0	0.0	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	0.0	0.0	0.0	13.8	22.7	8.9	0.0	0.0	0.0	11.1
LnGrp LOS	C	A	A	A	A	B	C	A	A	A	A	B
Approach Vol, veh/h		466			3			486			374	
Approach Delay, s/veh		27.0			13.8			17.2			11.1	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		24.6		35.0		24.6				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		29.5		19.5		29.5		19.5				
Max Q Clear Time (g_c+I1), s		25.6		18.9		10.0		2.1				
Green Ext Time (p_c), s		0.9		0.2		2.4		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			18.9									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/01/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	0	285	0	0	1	150	20	0	2	608	111
Future Volume (veh/h)	31	0	285	0	0	1	150	20	0	2	608	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1900	1900	1900	1841	1900	1900	1900	1885	1856
Adj Flow Rate, veh/h	33	0	300	0	0	1	158	21	0	2	640	117
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	0	2	0	0	0	4	0	0	0	1	3
Cap, veh/h	101	18	376	0	0	417	404	995	0	72	812	148
Arrive On Green	0.26	0.00	0.26	0.00	0.00	0.26	0.52	0.52	0.00	0.52	0.52	0.52
Sat Flow, veh/h	89	71	1451	0	0	1610	696	1900	0	1	1551	283
Grp Volume(v), veh/h	333	0	0	0	0	1	158	21	0	759	0	0
Grp Sat Flow(s),veh/h/ln	1610	0	0	0	0	1610	696	1900	0	1834	0	0
Q Serve(g_s), s	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.7	0.0	0.0	0.0	0.0	0.0	16.4	0.3	0.0	17.0	0.0	0.0
Prop In Lane	0.10		0.90	0.00		1.00	1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	496	0	0	0	0	417	404	995	0	1031	0	0
V/C Ratio(X)	0.67	0.00	0.00	0.00	0.00	0.00	0.39	0.02	0.00	0.74	0.00	0.00
Avail Cap(c_a), veh/h	790	0	0	0	0	716	404	995	0	1031	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.5	0.0	0.0	0.0	0.0	13.9	9.6	5.8	0.0	9.8	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	6.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	0.0	0.0	0.0	13.9	12.5	5.9	0.0	14.5	0.0	0.0
LnGrp LOS	B	A	A	A	A	B	B	A	A	B	A	A
Approach Vol, veh/h		333			1			179			759	
Approach Delay, s/veh		19.1			13.9			11.7			14.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.0		18.6		32.0		18.6				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		26.5		22.5		26.5		22.5				
Max Q Clear Time (g_c+I1), s		18.4		11.7		19.0		2.0				
Green Ext Time (p_c), s		0.7		1.5		3.3		0.0				

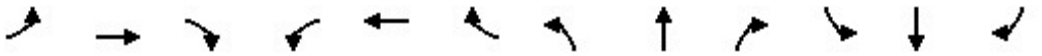
Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									

2045 Volumes + Plus Project

1% Growth Rate

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



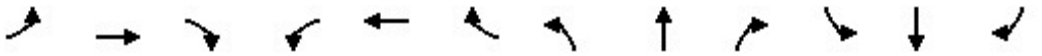
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	0	410	0	0	4	342	227	0	0	345	93
Future Volume (veh/h)	135	0	410	0	0	4	342	227	0	0	345	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1900	1856	1900	1900	1900	1856	1796
Adj Flow Rate, veh/h	141	0	427	0	0	4	356	236	0	0	359	97
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	0	3	0	0	0	3	7
Cap, veh/h	554	0	481	0	0	485	440	967	0	0	716	193
Arrive On Green	0.30	0.00	0.30	0.00	0.00	0.30	0.51	0.51	0.00	0.00	0.51	0.51
Sat Flow, veh/h	1427	0	1598	0	0	1610	928	1900	0	0	1407	380
Grp Volume(v), veh/h	141	0	427	0	0	4	356	236	0	0	0	456
Grp Sat Flow(s),veh/h/ln	1427	0	1598	0	0	1610	928	1900	0	0	0	1787
Q Serve(g_s), s	4.4	0.0	14.8	0.0	0.0	0.1	19.7	4.0	0.0	0.0	0.0	9.8
Cycle Q Clear(g_c), s	4.5	0.0	14.8	0.0	0.0	0.1	29.5	4.0	0.0	0.0	0.0	9.8
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.21
Lane Grp Cap(c), veh/h	554	0	481	0	0	485	440	967	0	0	0	909
V/C Ratio(X)	0.25	0.00	0.89	0.00	0.00	0.01	0.81	0.24	0.00	0.00	0.00	0.50
Avail Cap(c_a), veh/h	604	0	537	0	0	542	440	967	0	0	0	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	15.8	0.0	19.3	0.0	0.0	14.2	20.2	8.0	0.0	0.0	0.0	9.4
Incr Delay (d2), s/veh	0.2	0.0	15.3	0.0	0.0	0.0	14.8	0.6	0.0	0.0	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	6.8	0.0	0.0	0.0	6.1	1.5	0.0	0.0	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	0.0	34.6	0.0	0.0	14.2	35.0	8.6	0.0	0.0	0.0	11.4
LnGrp LOS	B	A	C	A	A	B	C	A	A	A	A	B
Approach Vol, veh/h		568			4			592			456	
Approach Delay, s/veh		30.0			14.2			24.5			11.4	
Approach LOS		C			B			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		23.0		35.0		23.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		29.5		19.5		29.5		19.5				
Max Q Clear Time (g_c+I1), s		31.5		16.8		11.8		2.1				
Green Ext Time (p_c), s		0.0		0.7		2.6		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			22.7									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	348	0	0	1	183	24	0	2	742	135
Future Volume (veh/h)	38	0	348	0	0	1	183	24	0	2	742	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1900	1900	1900	1841	1900	1900	1900	1885	1856
Adj Flow Rate, veh/h	40	0	366	0	0	1	193	25	0	2	781	142
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	0	2	0	0	0	4	0	0	0	1	3
Cap, veh/h	441	0	397	0	0	403	283	1188	0	41	781	142
Arrive On Green	0.25	0.00	0.25	0.00	0.00	0.25	0.07	0.63	0.00	0.50	0.50	0.50
Sat Flow, veh/h	1436	0	1585	0	0	1610	1753	1900	0	1	1552	282
Grp Volume(v), veh/h	40	0	366	0	0	1	193	25	0	925	0	0
Grp Sat Flow(s),veh/h/ln	1436	0	1585	0	0	1610	1753	1900	0	1834	0	0
Q Serve(g_s), s	1.9	0.0	20.0	0.0	0.0	0.0	4.4	0.4	0.0	7.4	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	20.0	0.0	0.0	0.0	4.4	0.4	0.0	44.6	0.0	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	441	0	397	0	0	403	283	1188	0	963	0	0
V/C Ratio(X)	0.09	0.00	0.92	0.00	0.00	0.00	0.68	0.02	0.00	0.96	0.00	0.00
Avail Cap(c_a), veh/h	462	0	420	0	0	426	285	1188	0	963	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.7	0.0	32.4	0.0	0.0	24.9	11.2	6.3	0.0	22.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	24.9	0.0	0.0	0.0	6.5	0.0	0.0	20.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	10.3	0.0	0.0	0.0	2.0	0.2	0.0	22.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	57.3	0.0	0.0	24.9	17.7	6.3	0.0	43.0	0.0	0.0
LnGrp LOS	C	A	E	A	A	C	B	A	A	D	A	A
Approach Vol, veh/h		406			1			218			925	
Approach Delay, s/veh		54.2			24.9			16.4			43.0	
Approach LOS		D			C			B			D	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		61.0		27.7	10.9	50.1		27.7				
Change Period (Y+Rc), s		5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s		55.5		23.5	6.5	44.5		23.5				
Max Q Clear Time (g_c+I1), s		2.4		22.0	6.4	46.6		2.0				
Green Ext Time (p_c), s		0.1		0.3	0.0	0.0		0.0				

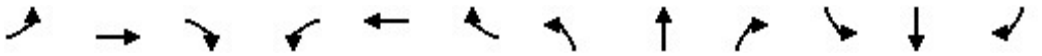
Intersection Summary												
HCM 6th Ctrl Delay			42.2									
HCM 6th LOS			D									

2045 Volumes + Plus Project

2% Growth Rate

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



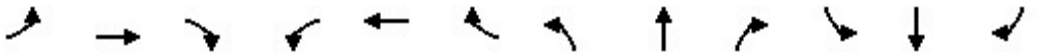
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	0	484	0	0	4	403	268	0	0	408	109
Future Volume (veh/h)	160	0	484	0	0	4	403	268	0	0	408	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1900	1856	1900	1900	1900	1856	1796
Adj Flow Rate, veh/h	167	0	504	0	0	4	420	279	0	0	425	114
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	0	3	0	0	0	3	7
Cap, veh/h	548	0	524	0	0	528	423	1045	0	0	446	120
Arrive On Green	0.33	0.00	0.33	0.00	0.00	0.33	0.18	0.55	0.00	0.00	0.32	0.32
Sat Flow, veh/h	1427	0	1598	0	0	1610	1767	1900	0	0	1409	378
Grp Volume(v), veh/h	167	0	504	0	0	4	420	279	0	0	0	539
Grp Sat Flow(s),veh/h/ln	1427	0	1598	0	0	1610	1767	1900	0	0	0	1787
Q Serve(g_s), s	8.0	0.0	27.9	0.0	0.0	0.2	16.3	7.0	0.0	0.0	0.0	26.6
Cycle Q Clear(g_c), s	8.1	0.0	27.9	0.0	0.0	0.2	16.3	7.0	0.0	0.0	0.0	26.6
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.21
Lane Grp Cap(c), veh/h	548	0	524	0	0	528	423	1045	0	0	0	566
V/C Ratio(X)	0.30	0.00	0.96	0.00	0.00	0.01	0.99	0.27	0.00	0.00	0.00	0.95
Avail Cap(c_a), veh/h	548	0	524	0	0	528	423	1045	0	0	0	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	29.7	0.0	0.0	20.4	24.6	10.7	0.0	0.0	0.0	30.1
Incr Delay (d2), s/veh	0.3	0.0	29.9	0.0	0.0	0.0	42.1	0.6	0.0	0.0	0.0	27.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	14.8	0.0	0.0	0.1	11.2	2.8	0.0	0.0	0.0	15.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	0.0	59.6	0.0	0.0	20.4	66.7	11.3	0.0	0.0	0.0	57.8
LnGrp LOS	C	A	E	A	A	C	E	B	A	A	A	E
Approach Vol, veh/h		671			4			699			539	
Approach Delay, s/veh		50.6			20.4			44.6			57.8	
Approach LOS		D			C			D			E	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		55.0		35.0	21.0	34.0		35.0				
Change Period (Y+Rc), s		5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s		49.5		29.5	16.5	28.5		29.5				
Max Q Clear Time (g_c+I1), s		9.0		29.9	18.3	28.6		2.2				
Green Ext Time (p_c), s		1.7		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			50.4									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	410	0	0	1	216	29	0	3	876	160
Future Volume (veh/h)	45	0	410	0	0	1	216	29	0	3	876	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1900	1900	1900	1841	1900	1900	1900	1885	1856
Adj Flow Rate, veh/h	47	0	432	0	0	1	227	31	0	3	922	168
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	0	2	0	0	0	4	0	0	0	1	3
Cap, veh/h	317	0	284	0	0	288	267	1385	0	31	979	178
Arrive On Green	0.18	0.00	0.18	0.00	0.00	0.18	0.06	0.73	0.00	0.63	0.63	0.63
Sat Flow, veh/h	1435	0	1585	0	0	1610	1753	1900	0	1	1551	282
Grp Volume(v), veh/h	47	0	432	0	0	1	227	31	0	1093	0	0
Grp Sat Flow(s),veh/h/ln	1435	0	1585	0	0	1610	1753	1900	0	1834	0	0
Q Serve(g_s), s	3.3	0.0	21.5	0.0	0.0	0.1	5.2	0.5	0.0	5.4	0.0	0.0
Cycle Q Clear(g_c), s	3.4	0.0	21.5	0.0	0.0	0.1	5.2	0.5	0.0	65.3	0.0	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	317	0	284	0	0	288	267	1385	0	1187	0	0
V/C Ratio(X)	0.15	0.00	1.52	0.00	0.00	0.00	0.85	0.02	0.00	0.92	0.00	0.00
Avail Cap(c_a), veh/h	317	0	284	0	0	288	285	1385	0	1187	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.8	0.0	49.3	0.0	0.0	40.5	19.0	4.5	0.0	20.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	251.8	0.0	0.0	0.0	20.0	0.0	0.0	12.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	28.4	0.0	0.0	0.0	5.1	0.2	0.0	29.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	301.0	0.0	0.0	40.5	39.0	4.5	0.0	33.1	0.0	0.0
LnGrp LOS	D	A	F	A	A	D	D	A	A	C	A	A
Approach Vol, veh/h		479			1			258			1093	
Approach Delay, s/veh		275.6			40.5			34.9			33.1	
Approach LOS		F			D			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		93.0		27.0	11.8	81.2		27.0				
Change Period (Y+Rc), s		5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s		87.5		21.5	8.5	74.5		21.5				
Max Q Clear Time (g_c+I1), s		2.5		23.5	7.2	67.3		2.1				
Green Ext Time (p_c), s		0.2		0.0	0.1	4.6		0.0				

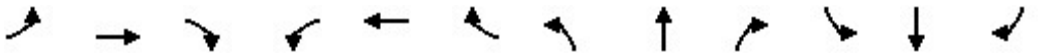
Intersection Summary												
HCM 6th Ctrl Delay			96.8									
HCM 6th LOS			F									

2045 Volumes + Plus Project

6% Growth Rate

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



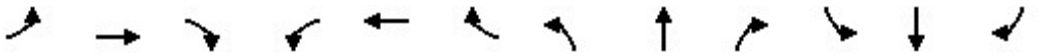
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	0	780	0	0	7	650	432	0	0	657	176
Future Volume (veh/h)	258	0	780	0	0	7	650	432	0	0	657	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1900	1900	1900	1856	1900	1900	1900	1856	1796
Adj Flow Rate, veh/h	269	0	812	0	0	7	677	450	0	0	684	183
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	0	3	0	0	0	3	7
Cap, veh/h	358	0	348	0	0	351	525	1337	0	0	569	152
Arrive On Green	0.22	0.00	0.22	0.00	0.00	0.22	0.27	0.70	0.00	0.00	0.40	0.40
Sat Flow, veh/h	1408	0	1598	0	0	1610	1767	1900	0	0	1410	377
Grp Volume(v), veh/h	269	0	812	0	0	7	677	450	0	0	0	867
Grp Sat Flow(s),veh/h/ln	1408	0	1598	0	0	1610	1767	1900	0	0	0	1788
Q Serve(g_s), s	25.5	0.0	30.5	0.0	0.0	0.5	37.5	12.9	0.0	0.0	0.0	56.5
Cycle Q Clear(g_c), s	25.9	0.0	30.5	0.0	0.0	0.5	37.5	12.9	0.0	0.0	0.0	56.5
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.21
Lane Grp Cap(c), veh/h	358	0	348	0	0	351	525	1337	0	0	0	721
V/C Ratio(X)	0.75	0.00	2.33	0.00	0.00	0.02	1.29	0.34	0.00	0.00	0.00	1.20
Avail Cap(c_a), veh/h	358	0	348	0	0	351	525	1337	0	0	0	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	53.2	0.0	54.8	0.0	0.0	43.0	45.1	8.1	0.0	0.0	0.0	41.8
Incr Delay (d2), s/veh	8.6	0.0	608.8	0.0	0.0	0.0	144.3	0.7	0.0	0.0	0.0	103.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	71.2	0.0	0.0	0.2	38.3	5.2	0.0	0.0	0.0	45.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	0.0	663.5	0.0	0.0	43.0	189.4	8.7	0.0	0.0	0.0	145.5
LnGrp LOS	E	A	F	A	A	D	F	A	A	A	A	F
Approach Vol, veh/h		1081			7			1127			867	
Approach Delay, s/veh		513.8			43.0			117.3			145.5	
Approach LOS		F			D			F			F	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		104.0		36.0	42.0	62.0		36.0				
Change Period (Y+Rc), s		5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s		98.5		30.5	37.5	56.5		30.5				
Max Q Clear Time (g_c+I1), s		14.9		32.5	39.5	58.5		2.5				
Green Ext Time (p_c), s		3.1		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			264.1									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
3: Kilauea Ave & Haihai St

05/23/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	0	661	0	0	2	348	46	0	5	1411	258
Future Volume (veh/h)	72	0	661	0	0	2	348	46	0	5	1411	258
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1900	1900	1900	1841	1900	1900	1900	1885	1856
Adj Flow Rate, veh/h	76	0	696	0	0	2	366	48	0	5	1485	272
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	0	2	0	0	0	4	0	0	0	1	3
Cap, veh/h	368	0	354	0	0	360	240	1336	0	25	914	167
Arrive On Green	0.22	0.00	0.22	0.00	0.00	0.22	0.08	0.70	0.00	0.59	0.59	0.59
Sat Flow, veh/h	1431	0	1585	0	0	1610	1753	1900	0	2	1549	283
Grp Volume(v), veh/h	76	0	696	0	0	2	366	48	0	1762	0	0
Grp Sat Flow(s),veh/h/ln	1431	0	1585	0	0	1610	1753	1900	0	1834	0	0
Q Serve(g_s), s	6.5	0.0	33.5	0.0	0.0	0.1	12.5	1.2	0.0	26.3	0.0	0.0
Cycle Q Clear(g_c), s	6.7	0.0	33.5	0.0	0.0	0.1	12.5	1.2	0.0	88.5	0.0	0.0
Prop In Lane	1.00		1.00	0.00		1.00	1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h	368	0	354	0	0	360	240	1336	0	1106	0	0
V/C Ratio(X)	0.21	0.00	1.97	0.00	0.00	0.01	1.53	0.04	0.00	1.59	0.00	0.00
Avail Cap(c_a), veh/h	368	0	354	0	0	360	240	1336	0	1106	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.9	0.0	58.3	0.0	0.0	45.3	39.3	6.8	0.0	31.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	444.9	0.0	0.0	0.0	256.9	0.1	0.0	271.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	57.3	0.0	0.0	0.1	22.1	0.5	0.0	122.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	503.1	0.0	0.0	45.3	296.2	6.8	0.0	303.0	0.0	0.0
LnGrp LOS	D	A	F	A	A	D	F	A	A	F	A	A
Approach Vol, veh/h		772			2			414			1762	
Approach Delay, s/veh		458.3			45.3			262.7			303.0	
Approach LOS		F			D			F			F	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		111.0		39.0	17.0	94.0		39.0				
Change Period (Y+Rc), s		5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s		105.5		33.5	12.5	88.5		33.5				
Max Q Clear Time (g_c+I1), s		3.2		35.5	14.5	90.5		2.1				
Green Ext Time (p_c), s		0.3		0.0	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			337.8									
HCM 6th LOS			F									

SIDRA

Existing Conditions + Plus Project

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - AM - SU-40 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	280	3.0	292	3.0	0.405	7.1	LOS A	2.5	64.2	0.37	0.21	0.37	29.4
8	T1	186	0.0	194	0.0	0.405	7.0	LOS A	2.5	64.2	0.37	0.21	0.37	29.4
18	R2	1	0.0	1	0.0	0.405	7.0	LOS A	2.5	64.2	0.37	0.21	0.37	28.8
Approach		467	1.8	486	1.8	0.405	7.0	LOS A	2.5	64.2	0.37	0.21	0.37	29.4
East: Driveway														
1	L2	1	0.0	1	0.0	0.007	4.9	LOS A	0.0	0.7	0.54	0.38	0.54	30.9
6	T1	1	0.0	1	0.0	0.007	4.9	LOS A	0.0	0.7	0.54	0.38	0.54	30.9
16	R2	3	0.0	3	0.0	0.007	4.9	LOS A	0.0	0.7	0.54	0.38	0.54	30.2
Approach		5	0.0	5	0.0	0.007	4.9	LOS A	0.0	0.7	0.54	0.38	0.54	30.5
North: Kilauea Ave														
7	L2	1	0.0	1	0.0	0.384	7.8	LOS A	2.0	52.5	0.54	0.44	0.54	30.1
4	T1	283	3.0	295	3.0	0.384	7.9	LOS A	2.0	52.5	0.54	0.44	0.54	30.1
14	R2	76	7.0	79	7.0	0.384	8.0	LOS A	2.0	52.5	0.54	0.44	0.54	29.4
Approach		360	3.8	375	3.8	0.384	7.9	LOS A	2.0	52.5	0.54	0.44	0.54	29.9
West: Haihai St														
5	L2	111	0.0	116	0.0	0.465	9.0	LOS A	2.8	70.3	0.60	0.50	0.60	29.2
2	T1	1	0.0	1	0.0	0.465	9.0	LOS A	2.8	70.3	0.60	0.50	0.60	29.2
12	R2	336	1.0	350	1.0	0.465	9.0	LOS A	2.8	70.3	0.60	0.50	0.60	28.6
Approach		448	0.8	467	0.7	0.465	9.0	LOS A	2.8	70.3	0.60	0.50	0.60	28.7
All Vehicles		1280	2.0	1333	2.0	0.465	8.0	LOS A	2.8	70.3	0.50	0.38	0.50	29.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - PM - SU-40 (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	150	4.0	156	4.0	0.139	4.0	LOS A	0.6	16.5	0.14	0.05	0.14	30.1
8	T1	20	0.0	21	0.0	0.139	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	30.1
18	R2	1	0.0	1	0.0	0.139	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	29.5
Approach		171	3.5	178	3.5	0.139	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	30.1
East: Driveway														
1	L2	1	0.0	1	0.0	0.003	3.3	LOS A	0.0	0.3	0.34	0.15	0.34	31.4
6	T1	1	0.0	1	0.0	0.003	3.3	LOS A	0.0	0.3	0.34	0.15	0.34	31.4
16	R2	1	0.0	1	0.0	0.003	3.3	LOS A	0.0	0.3	0.34	0.15	0.34	30.7
Approach		3	0.0	3	0.0	0.003	3.3	LOS A	0.0	0.3	0.34	0.15	0.34	31.2
North: Kilauea Ave														
7	L2	2	0.0	2	0.0	0.652	12.0	LOS B	5.8	146.1	0.63	0.44	0.63	28.5
4	T1	608	1.0	633	1.0	0.652	12.0	LOS B	5.8	146.1	0.63	0.44	0.63	28.5
14	R2	111	3.0	116	3.0	0.652	12.1	LOS B	5.8	146.1	0.63	0.44	0.63	27.9
Approach		721	1.3	751	1.3	0.652	12.0	LOS B	5.8	146.1	0.63	0.44	0.63	28.4
West: Haihai St														
5	L2	31	3.0	32	3.0	0.471	12.0	LOS B	2.9	73.9	0.73	0.83	1.01	28.3
2	T1	1	0.0	1	0.0	0.471	11.9	LOS B	2.9	73.9	0.73	0.83	1.01	28.3
12	R2	285	2.0	297	2.0	0.471	12.0	LOS B	2.9	73.9	0.73	0.83	1.01	27.7
Approach		317	2.1	330	2.1	0.471	12.0	LOS B	2.9	73.9	0.73	0.83	1.01	27.8
All Vehicles		1212	1.8	1263	1.8	0.652	10.9	LOS B	5.8	146.1	0.59	0.48	0.66	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2045 Volumes + Plus Project

1% Growth Rate

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - AM -1% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	342	3.0	356	3.0	0.507	8.8	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
8	T1	227	0.0	236	0.0	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
18	R2	1	0.0	1	0.0	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.2
Approach		570	1.8	594	1.8	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
East: Driveway														
1	L2	1	0.0	1	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.7
6	T1	1	0.0	1	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.7
16	R2	4	0.0	4	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.0
Approach		6	0.0	6	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.2
North: Kilauea Ave														
7	L2	1	0.0	1	0.0	0.501	10.2	LOS B	3.6	92.0	0.65	0.66	0.80	29.2
4	T1	345	3.0	359	3.0	0.501	10.3	LOS B	3.6	92.0	0.65	0.66	0.80	29.1
14	R2	93	7.0	97	7.0	0.501	10.5	LOS B	3.6	92.0	0.65	0.66	0.80	28.5
Approach		439	3.8	457	3.8	0.501	10.4	LOS B	3.6	92.0	0.65	0.66	0.80	29.0
West: Haihai St														
5	L2	135	0.0	141	0.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.9
2	T1	1	0.0	1	0.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.8
12	R2	410	1.0	427	1.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.3
Approach		546	0.8	569	0.8	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.4
All Vehicles		1561	2.0	1626	2.0	0.607	10.5	LOS B	6.4	161.3	0.62	0.60	0.79	28.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - AM -1% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	342	3.0	356	3.0	0.507	8.8	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
8	T1	227	0.0	236	0.0	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
18	R2	1	0.0	1	0.0	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.2
Approach		570	1.8	594	1.8	0.507	8.7	LOS A	3.6	91.0	0.47	0.30	0.47	28.8
East: Driveway														
1	L2	1	0.0	1	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.7
6	T1	1	0.0	1	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.7
16	R2	4	0.0	4	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.0
Approach		6	0.0	6	0.0	0.010	5.7	LOS A	0.0	0.9	0.59	0.45	0.59	30.2
North: Kilauea Ave														
7	L2	1	0.0	1	0.0	0.501	10.2	LOS B	3.6	92.0	0.65	0.66	0.80	29.2
4	T1	345	3.0	359	3.0	0.501	10.3	LOS B	3.6	92.0	0.65	0.66	0.80	29.1
14	R2	93	7.0	97	7.0	0.501	10.5	LOS B	3.6	92.0	0.65	0.66	0.80	28.5
Approach		439	3.8	457	3.8	0.501	10.4	LOS B	3.6	92.0	0.65	0.66	0.80	29.0
West: Haihai St														
5	L2	135	0.0	141	0.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.9
2	T1	1	0.0	1	0.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.8
12	R2	410	1.0	427	1.0	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.3
Approach		546	0.8	569	0.8	0.607	12.6	LOS B	6.4	161.3	0.74	0.86	1.12	27.4
All Vehicles		1561	2.0	1626	2.0	0.607	10.5	LOS B	6.4	161.3	0.62	0.60	0.79	28.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2045 Volumes + Plus Project

2% Growth Rate

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - AM -2% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	403	3.0	420	3.0	0.613	11.1	LOS B	5.0	126.9	0.59	0.41	0.59	27.9
8	T1	268	0.0	279	0.0	0.613	11.0	LOS B	5.0	126.9	0.59	0.41	0.59	27.9
18	R2	1	0.0	1	0.0	0.613	11.0	LOS B	5.0	126.9	0.59	0.41	0.59	27.4
Approach		672	1.8	700	1.8	0.613	11.1	LOS B	5.0	126.9	0.59	0.41	0.59	27.9
East: Driveway														
1	L2	1	0.0	1	0.0	0.011	6.5	LOS A	0.0	1.0	0.62	0.51	0.62	30.3
6	T1	1	0.0	1	0.0	0.011	6.5	LOS A	0.0	1.0	0.62	0.51	0.62	30.3
16	R2	4	0.0	4	0.0	0.011	6.5	LOS A	0.0	1.0	0.62	0.51	0.62	29.7
Approach		6	0.0	6	0.0	0.011	6.5	LOS A	0.0	1.0	0.62	0.51	0.62	29.9
North: Kilauea Ave														
7	L2	1	0.0	1	0.0	0.632	14.2	LOS B	6.6	170.1	0.77	0.98	1.28	27.7
4	T1	408	3.0	425	3.0	0.632	14.3	LOS B	6.6	170.1	0.77	0.98	1.28	27.7
14	R2	109	7.0	114	7.0	0.632	14.5	LOS B	6.6	170.1	0.77	0.98	1.28	27.1
Approach		518	3.8	540	3.8	0.632	14.3	LOS B	6.6	170.1	0.77	0.98	1.28	27.6
West: Haihai St														
5	L2	160	0.0	167	0.0	0.768	20.1	LOS C	12.5	314.9	0.92	1.33	1.86	25.5
2	T1	1	0.0	1	0.0	0.768	20.1	LOS C	12.5	314.9	0.92	1.33	1.86	25.4
12	R2	484	1.0	504	1.0	0.768	20.2	LOS C	12.5	314.9	0.92	1.33	1.86	25.0
Approach		645	0.8	672	0.8	0.768	20.2	LOS C	12.5	314.9	0.92	1.33	1.86	25.1
All Vehicles		1841	2.0	1918	2.0	0.768	15.2	LOS C	12.5	314.9	0.76	0.89	1.23	26.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - PM - 2% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	216	4.0	225	4.0	0.203	4.6	LOS A	1.0	25.8	0.19	0.07	0.19	29.8
8	T1	29	0.0	30	0.0	0.203	4.5	LOS A	1.0	25.8	0.19	0.07	0.19	29.9
18	R2	1	0.0	1	0.0	0.203	4.5	LOS A	1.0	25.8	0.19	0.07	0.19	29.2
Approach		246	3.5	256	3.5	0.203	4.6	LOS A	1.0	25.8	0.19	0.07	0.19	29.8
East: Driveway														
1	L2	1	0.0	1	0.0	0.003	3.6	LOS A	0.0	0.3	0.40	0.21	0.40	31.3
6	T1	1	0.0	1	0.0	0.003	3.6	LOS A	0.0	0.3	0.40	0.21	0.40	31.2
16	R2	1	0.0	1	0.0	0.003	3.6	LOS A	0.0	0.3	0.40	0.21	0.40	30.6
Approach		3	0.0	3	0.0	0.003	3.6	LOS A	0.0	0.3	0.40	0.21	0.40	31.0
North: Kilauea Ave														
7	L2	3	0.0	3	0.0	1.011	49.9	LOS F	63.8	1611.6	1.00	2.14	3.40	19.2
4	T1	876	1.0	912	1.0	1.011	50.0	LOS F	63.8	1611.6	1.00	2.14	3.40	19.2
14	R2	160	3.0	167	3.0	1.011	50.0	LOS F	63.8	1611.6	1.00	2.14	3.40	19.0
Approach		1039	1.3	1082	1.3	1.011	50.0	LOS E	63.8	1611.6	1.00	2.14	3.40	19.2
West: Haihai St														
5	L2	45	3.0	47	3.0	0.899	45.9	LOS E	12.3	311.5	0.95	1.65	3.00	19.7
2	T1	1	0.0	1	0.0	0.899	45.7	LOS E	12.3	311.5	0.95	1.65	3.00	19.8
12	R2	410	2.0	427	2.0	0.899	45.8	LOS E	12.3	311.5	0.95	1.65	3.00	19.5
Approach		456	2.1	475	2.1	0.899	45.8	LOS E	12.3	311.5	0.95	1.65	3.00	19.5
All Vehicles		1744	1.8	1817	1.8	1.011	42.4	LOS E	63.8	1611.6	0.87	1.72	2.84	20.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

2045 Volumes + Plus Project

6% Growth Rate

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - PM - 6% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	348	4.0	363	4.0	0.329	5.9	LOS A	1.9	48.4	0.24	0.11	0.24	29.3
8	T1	46	0.0	48	0.0	0.329	5.8	LOS A	1.9	48.4	0.24	0.11	0.24	29.3
18	R2	1	0.0	1	0.0	0.329	5.8	LOS A	1.9	48.4	0.24	0.11	0.24	28.7
Approach		395	3.5	411	3.5	0.329	5.9	LOS A	1.9	48.4	0.24	0.11	0.24	29.3
East: Driveway														
1	L2	1	0.0	1	0.0	0.005	4.3	LOS A	0.0	0.5	0.49	0.31	0.49	31.1
6	T1	1	0.0	1	0.0	0.005	4.3	LOS A	0.0	0.5	0.49	0.31	0.49	31.1
16	R2	2	0.0	2	0.0	0.005	4.3	LOS A	0.0	0.5	0.49	0.31	0.49	30.4
Approach		4	0.0	4	0.0	0.005	4.3	LOS A	0.0	0.5	0.49	0.31	0.49	30.8
North: Kilauea Ave														
7	L2	5	0.0	5	0.0	1.884	414.9	LOS F	289.8	7320.1	1.00	7.30	14.71	4.7
4	T1	1411	1.0	1470	1.0	1.884	415.0	LOS F	289.8	7320.1	1.00	7.30	14.71	4.7
14	R2	258	3.0	269	3.0	1.884	415.0	LOS F	289.8	7320.1	1.00	7.30	14.71	4.6
Approach		1674	1.3	1744	1.3	1.884	415.0	LOS F	289.8	7320.1	1.00	7.30	14.71	4.7
West: Haihai St														
5	L2	72	3.0	75	3.0	1.278	159.6	LOS F	67.5	1716.2	1.00	4.05	9.58	9.8
2	T1	1	0.0	1	0.0	1.278	159.5	LOS F	67.5	1716.2	1.00	4.05	9.58	9.8
12	R2	661	2.0	689	2.0	1.278	159.6	LOS F	67.5	1716.2	1.00	4.05	9.58	9.7
Approach		734	2.1	765	2.1	1.278	159.6	LOS F	67.5	1716.2	1.00	4.05	9.58	9.7
All Vehicles		2807	1.8	2924	1.8	1.884	290.0	LOS F	289.8	7320.1	0.89	5.43	11.31	6.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Four Mile Creek - AM -6% plus project (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Kilauea Ave														
3	L2	650	3.0	677	3.0	1.015	50.2	LOS F	72.0	1827.2	1.00	1.94	3.16	18.9
8	T1	432	0.0	450	0.0	1.015	50.1	LOS F	72.0	1827.2	1.00	1.94	3.16	18.9
18	R2	1	0.0	1	0.0	1.015	50.1	LOS F	72.0	1827.2	1.00	1.94	3.16	18.6
Approach		1083	1.8	1128	1.8	1.015	50.2	LOS F	72.0	1827.2	1.00	1.94	3.16	18.9
East: Driveway														
1	L2	1	0.0	1	0.0	0.026	10.4	LOS B	0.1	2.3	0.75	0.75	0.75	28.9
6	T1	1	0.0	1	0.0	0.026	10.4	LOS B	0.1	2.3	0.75	0.75	0.75	28.9
16	R2	7	0.0	7	0.0	0.026	10.4	LOS B	0.1	2.3	0.75	0.75	0.75	28.3
Approach		9	0.0	9	0.0	0.026	10.4	LOS B	0.1	2.3	0.75	0.75	0.75	28.4
North: Kilauea Ave														
7	L2	1	0.0	1	0.0	1.317	172.7	LOS F	82.8	2134.0	1.00	4.45	10.23	9.4
4	T1	657	3.0	684	3.0	1.317	172.9	LOS F	82.8	2134.0	1.00	4.45	10.23	9.3
14	R2	176	7.0	183	7.0	1.317	173.1	LOS F	82.8	2134.0	1.00	4.45	10.23	9.3
Approach		834	3.8	869	3.8	1.317	172.9	LOS F	82.8	2134.0	1.00	4.45	10.23	9.3
West: Haihai St														
5	L2	258	0.0	269	0.0	1.378	195.2	LOS F	115.2	2897.2	1.00	4.95	10.79	8.5
2	T1	1	0.0	1	0.0	1.378	195.2	LOS F	115.2	2897.2	1.00	4.95	10.79	8.5
12	R2	780	1.0	813	1.0	1.378	195.2	LOS F	115.2	2897.2	1.00	4.95	10.79	8.4
Approach		1039	0.8	1082	0.8	1.378	195.2	LOS F	115.2	2897.2	1.00	4.95	10.79	8.4
All Vehicles		2965	2.0	3089	2.0	1.378	135.4	LOS F	115.2	2897.2	1.00	3.70	7.82	11.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX B
Biological Survey

HALEY ALDRICH

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FINAL - REVISED

BIOLOGICAL SURVEY REPORT
FOUR MILE CREEK BRIDGE IMPROVEMENT PROJECT (#22-7)
STATE CONTRACT NO. 70723, COUNTY CONTRACT NO. C.010415
HILO, HAWAIʻI ISLAND, HAWAIʻI

by
Haley & Aldrich, Inc.
500 Ala Moana Boulevard, Suite 6-250
Honolulu, HI 96813

for
Consor Engineers, LLC
737 Bishop Street Suite 2530
Honolulu, HI 96813

File No. 0206084-000
January 27, 2026

HALEY & ALDRICH, INC.
500 ALA MOANA BLVD
SUITE 6-250
HONOLULU, HI 96813

January 27, 2026
File No. 0206084-000

Nicole Kapaskis, P.E.
Consor Engineers, LLC
737 Bishop Street Suite 2530
Honolulu, Hawai'i 96813

Subject: Revised Biological Survey Report for the
Four Mile Creek Bridge Improvements Project (#22-7)
State Contract No. 70723, County Contract No. C010415
Hilo, Hawai'i Island, Hawai'i
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Ms. Kapasakis,

Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to provide this Revised Biological Survey Report for the Four Mile Creek Bridge Improvements Project, located in Hilo, on the east side of Hawai'i Island. Our work was performed in general accordance with our subconsultant agreement with Consor Engineers, LLC., dated January 25, 2023.

The original final copy of this report was filed on October 10, 2025. Since the final report was published, the project area underwent a minor change as design progressed, adding approximately 0.3 acres to the Area of Potential Effect that were not included in the 2025 report. This revised report includes analysis of this additional area, and photos of the area were added to Appendix B (Photos 9 and 10). Recommendations for avoidance and minimization measures for the project have not changed.

Should you have any questions or comments, please feel free to contact us at 808.470.2081 or email tchock@haleyaldrich.com.

Sincerely yours,
HALEY & ALDRICH, INC.

Taylor Chock
Environmental Scientist

Jim Shannon
Associate Senior Biologist

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1. Introduction

1.1 BACKGROUND AND PROJECT DESCRIPTION

The County of Hawai'i Department of Public Works (DPW) and the State of Hawai'i Department of Transportation – Highways (HDOT), is proposing to replace, raise, and widen the Four Mile Creek Bridge to accommodate roadway and pedestrian facility improvements along the adjacent segments of Kīlauea Avenue and Haihai Street in Hilo, on the east side of Hawai'i Island. The bridge carries Kīlauea Avenue over Four Mile Creek (Ka'ahakini Stream) (Appendix A; Figure 1).

The project is jointly funded by the DPW and HDOT. There are no federal funds anticipated for the project.

This Biological Survey Report is intended to support the draft Environmental Assessment (EA) that is being prepared for the project, pursuant to requirements of Hawai'i Revised Statutes (HRS) Chapter 343, as amended, and Hawai'i Administrative Rules (HAR) Title 11, Chapter 200.1. Compliance with state Hawai'i Environmental Protection Act (HEPA) rules is triggered because of the use of county lands and funds and the proposed use of land within the conservation state land use district.

1.1.1 Project Purpose and Need

The historic one-lane Four Mile Creek Bridge was originally built in 1916 and assumed its current configuration in 1964, when the existing substructure components had a new abutment and pier caps added and its deck altered with tee beams. The existing bridge can only accommodate one car at a time and creates traffic in both directions on Kīlauea Avenue, which affects the nearby intersection of Kīlauea Avenue and Haihai Street north of the bridge and accumulates southbound traffic along Highway 11. The inspections concluded that the bridge overall needs corrective action as many of the bridge features do not meet current acceptable standards (DPW, 2019; Delaware Online, 2021). These safety corrective actions, along with the need to alleviate traffic, constitute the purpose for the Four Mile Creek Bridge replacement.

1.1.2 Proposed Action

The proposed action will remove the existing 20 feet and 3 inches wide bridge and superstructure in its entirety and replace it with a single-span concrete girder bridge more than three times in width (68 feet and 2 inches wide). The widened bridge will accommodate two through traffic lanes (northbound and southbound), one westbound left turn lane, two five-foot bike lanes/shoulders, two three-foot buffers, and two eight-foot-wide raised sidewalks. The north and south approaches to the bridge will be widened on the makai side of Kīlauea Avenue to accommodate the new turn lane and sidewalks and will taper from the additional width approximately 350 feet to the north and south of the bridge. On the makai side of the project area, the additional bridge width will require the new structure to extend nearly 41 feet beyond the limits of the existing bridge footprint. At the Kīlauea Avenue and Haihai Street intersection north of the bridge, a traffic signal is proposed to be installed. The east side of the intersection will be widened to accommodate the addition of the northbound and westbound left turn lane and ADA-accessible curb ramps will be installed with the intention of being connected to a future sidewalk system planned as part of the future DPW Safe Routes to School: Safe Route to Waiakea Schools – Kilauea Ave project (Appendix A; Figure 2).

The bridge removal and replacement will span over the width of Four Mile Creek, widening the stream to allow for more flow capacity below the proposed bridge in comparison to the existing bridge which

currently acts as a chokepoint during major flow events. Rip rap along the stream embankments will be installed to stabilize the abutments; installation will occur below existing grade for the majority of the riprap alignment. An Approved Jurisdictional Determination (AJD) request was submitted to the U.S. Army Corps of Engineers (USACE); if not approved, a USACE Nationwide Permit (NWP) (likely NWP #13 for Bank Stabilization) will be required for grading and installing rip rap along the stream banks. A Nationwide Permit would constitute a federal action, and, thus, the project would require evaluation under Section 7 of the Endangered Species Act (ESA) by the the United States Fish and Wildlife Service (USFWS) Pacific Islands Fish and Wildlife Office (PIFWO).

The staging area initially identified for the project is a portion of the abandoned Pana‘ewa Farm Lot owned by the State of Hawai‘i (TMK 2-2-048:001), approximately 1,000 feet southeast of the existing bridge. The staging area would be in the cleared southern area of the lot, up to the tree line. No trees will need to be removed in the staging area; however, trees and vegetation immediately adjacent to the bridge will need to be cleared for construction.

1.2 AREA OF POTENTIAL EFFECT

The Area of Potential Effect (APE) occupies approximately 9.2 acres, as shown on the attached Site Map (Appendix A; Figure 1). The bridge, road, and intersection areas are approximately 4.2 acres, and 5 acres of the Pana‘ewa Farm Lot owned by the State of Hawai‘i (TMK 2-2-048:001) is proposed as a staging area. The Pana‘ewa Farm Lot is located approximately 1,000 feet southeast of the existing bridge and not currently in use.

Approximately 0.3 acres were added to the south end of the APE in January 2026 as design progressed, in order to accommodate tapering the roadway from the proposed extended width to the existing roadway. The added area is the southernmost section of the APE along Kilauea Avenue (Appendix B, Photos 9 and 10). The majority of this section of land is included within the ROW for the intersection with Makalika Street.

2. Description of Study Area

2.1 CLIMATE AND PRECIPITATION

The climate on the east side of Hawai'i Island is tropical and dominated by northeast trade winds that bring warm, moisture-laden air approximately 70 percent of the year. As a result of the steep topography, northern and eastern (windward) parts of the island record heavier rainfall than other parts of the island (Giambelluca et al. 2013, 2014). The mean yearly temperature in Hilo is about 72 degrees Fahrenheit (°F) and annual rainfall is approximately 145 inches (Giambelluca et al. 2013, 2014). The dry season is typically between May to October and characterized by northeast winds and sun, and the wet season is typically between October to April and characterized by cooler temperatures, cloud cover and rain, and variable winds. The average temperature of hottest summer months (July through September) is 75°F, and the average temperature of the winter months (November through February) is 69.5°F.

Hilo experiences a moderate climate with a significant amount of rainfall throughout the year. Hilo's climate is classified as "Af" according to the Köppen-Geiger climate classification: "Equatorial rainforest, fully humid (Af): A climate which sees all twelve months with very warm temperatures and a lot of rainfall".

During the survey that was conducted on June 11, 2024, the weather was sunny and dry, with a high of 84°F and a low of 69°F. The nearest National Oceanic and Atmospheric Administration (NOAA) rain station located at the Hilo International Airport logged a trace amount of rain (NOAA, 2024). Monthly total precipitation in May 2024 was 9.75 inches, which exceeded average rainfall for the month (6.99 inches). No rain event over 0.1 inches occurred in the week preceding the survey (June 4 to 10, 2024) (Appendix B; NOAA, 2024).

2.2 TOPOGRAPHY

A topographic survey of the project site was performed on March 13, 2023. Kīlauea Avenue slopes south to north at an approximate 2.4 to 3.6 percent slope with an elevation between 207 to 194 feet mean sea level (MSL). The elevation of Kīlauea Avenue across the Four Mile Creek Bridge is approximately 194 feet MSL. The natural slope subtly slopes from mauka (west) to makai (east).

2.3 SOILS

The soils in the staging area and southern half of the soil map are classified as Papai extremely cobbly highly decomposed plant material, 2 to 10 percent slopes. These soils are derived from A'a lava flows and are classified as well-drained soils with low runoff. North of the Four Mile Creek Stream, the soils are classified as Panaewa very cobbly hydrous loam, 2 to 10 percent slopes. These soils are derived from volcanic ash over pāhoehoe lava flows and are characterized by moderately well drained soils with high runoff. The northern side of the APE, north of the Kīlauea Avenue and Haihai Street intersection, are underlain by Panaewa-Urban land complex soils, 2 to 10 percent slopes. These soils are also derived from basic volcanic ash over pāhoehoe lava and are characterized by moderately well drained soils with high runoff. None of these soils are considered to be hydric soils (Appendix A, Figure 3; USDA NRCS, 2024).

2.4 WETLAND HABITATS

The section of Four Mile Creek Stream that passes through the project area is classified as a riverine, intermittent, streambed, seasonally flooded wetland (R4SBC) by the USFWS National Wetlands Inventory

(NWI). Downstream and east of the project area, the unlined flood channel is classified as a riverine, unknown perennial stream with an unconsolidated bottom that is permanently flooded (R5UBH) (USFWS, 2024a). A map of NWI wetlands is shown in Appendix A on Figure 4.

Although labeled as an NWI-wetland, a 2021 USACE March 2021 Feasibility Report and Environmental Assessment describes the Four Mile Creek Unlined Flood Control Channel as Non-Federal waters (USACE, 2021). The 2021 USACE report contains studies conducted on the Waiākea-Palai Streams and Four Mile Creek flood plains and describes how the Four Mile Creek is intermittent and dry during most of the year. Four Mile Creek is further described as draining into undeveloped lowlands near the Hilo Drag Strip south of Hilo International Airport. The creek flows away from Hilo through an unlined flood control channel that was constructed by the DPW. The 10,000-foot-long channel begins at the Kanoelehua Street [Highway-11] Bridge and empties near an old quarry on the east side of Hilo. Drainage from this channel is into a lava tube and does not reach the ocean (personal communications March 1, 2023 with Bryce Harada, Engineering Division, County of Hawai'i, DPW).

Although Four Mile Creek may not meet the definition of Waters of the United States under the Conforming Rule, correspondence with the USACE Honolulu District Regulatory office (personal communication with Jeremy Morgan, USACE POH Regulatory on November 8, 2024), indicated that the USACE would assume jurisdiction over work on the stream, and that the rip rap intended to be installed below the ordinary high water mark (OHWM) to protect the bridge abutments would require a Section 404 NWP. Further correspondence with the USACE Honolulu District Regulatory office (personal communication with David Rojek, USACE POH Regulatory on January 9, 2026) indicated that a NWP was no longer recommended as the path for the project, and that USACE would review an AJD for the project.

2.5 DESIGNATED OR PROPOSED CRITICAL HABITATS

There are no designated or proposed Critical Habitats within or near to the APE (Appendix A, Figure 5; USFWS, 2024b).

3. Methods

Prior to conducting field work, biologists reviewed publicly available scientific literature, topographic maps and images, as well as environmental compliance documents, and engineering drawings relevant to the proposed project provided by the client. The USFWS Information for Planning and Consultation (IPaC) and Wetland Mapper websites were viewed to gather information on federally listed threatened or endangered species and wetland habitats that may be present within or adjacent to the APE (PIFWO, 2026).

Terrestrial wildlife and vegetation surveys were conducted by biologists Maya LeGrande and Taylor Chock within the APE on June 11, 2024, between 9:30am and 1pm. The weather during field work was dry and sunny, with ENE winds at 10 to 20 miles per hour. The surveys were conducted at and around the Four Mile Creek Stream Bridge, the staging area in the Pana'ewa Farm Lot, the adjacent intersection of Kīlauea Avenue and Haihai Street, and areas into which the proposed roadway and intersection will expand. In addition, the Four Mile Creek Stream was surveyed approximately 50 feet upstream and downstream of the bridge crossing. The Four Mile Creek Stream was dry during the survey. Appendix A, Figure 1 illustrates the aerial extent of the terrestrial biological survey.

Birds were identified visually as well as by their vocalizations. A five-minute point count was done at the bridge and at the proposed staging area. Additional incidental observations were collected during the pedestrian survey. Observations of mammals, amphibians, reptiles, and insects and their signs were made incidental to the avian surveys and related vegetation surveys.

Observed plant species were documented. Plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, and related factors were noted. Rocky outcrops, shaded areas, and depressions that are more likely to support native plant species were targeted for survey.

Seasonal and temporal changes may affect the presence and location of plants and wildlife, and only plants and wildlife present at the time of the survey were documented.

4. Results and Discussion

Photos from the site visit on June 11, 2024 showing the typical vegetation and project area are included in Appendix C.

4.1 TERRESTRIAL FAUNA

4.1.1 Birds

Birds observed during the pedestrian survey and bird counts on June 11, 2024 were all non-native, introduced species (Table 1). Nine non-native bird species were documented during the survey. The most prevalent birds seen and heard were Common Myna (*Acridotheres tristis*), Zebra dove (*Geopelia striata*), and Red junglefowl (*Gallus gallus*). Cattle Egret (*Bubulcus ibis*), Warbling White-eyes (*Zosterops japonicus*), House Finch (*Paroaria coronata*), and Rose-ringed Parakeets (*Psittacula krameri*) were observed less frequently.

Table 1: Birds Observed During the Survey

Common Name	Scientific Name	Biogeographic Status	Protected Status
Cattle Egret	*Bubulcus ibis*	Naturalized non-native resident	MBTA*
Common Myna	*Acridotheres tristis*	Naturalized non-native resident	None
Mejiro, Warbling White-eye	*Zosterops japonicus*	Naturalized non-native resident	None
Chestnut Munia	*Lonchura atricapilla*	Naturalized non-native resident	None
House Finch	*Haemorhous mexicanus*	Naturalized non-native resident	MBTA*
Saffron Finch	*Sicalis flaveola*	Naturalizednon-native resident	None
Rose-ringed Parakeet	*Psittacula krameri*	Naturalized non-native resident	None
Zebra Dove	*Geopelia striata*	Naturalized non-native resident	None
Red Junglefowl	*Gallus gallus*	Naturalized non-native resident	None

Note:
**MBTA: Protected by the Migratory Bird Treaty Act*

4.1.2 Mammals

During the survey, domesticated dogs were heard in the area. No other mammals were observed within the APE, but feral cats *(Felis catus)*, dogs (*Canis lupus familiaris*), pigs (*Sus scrofa)*, small Indian mongoose (*Herpestes javanicus*), and rodents such as European house mice (*Mus musculus domesticus*), roof rat (*Rattus r. rattus*), brown rat (*Rattus norvegicus*), or possibly Polynesian rats (*Rattus exulans hawaiiensis*) likely use resources found within the APE. All these introduced mammals are deleterious to native ecosystems and the native faunal species dependent on them if their populations are unmanaged.

The IPaC lists the Endangered Hawaiian hoary bat, or *ʻōpeʻapeʻa* (*Lasiurus cinereus semotus*), currently recognized as an endemic species *Lasiurus semotus* (Pinzari et al., 2020), as a species that may occur in the APE. Hawaiian hoary bats are known to occur from sea level to upper elevations across a wide range of relatively undisturbed and highly modified habitats and may roost in both native and introduced tree species over 15 feet in height (Mitchell et al., 2005). Many of the trees in the APE are greater than 15 feet in height and may serve as roosting habitat for Hawaiian hoary bats. Although we did not observe any bats during our survey, they should be considered present and appropriate mitigation measures for their protection should be implemented.

4.2 TERRESTRIAL PLANTS

The entire project area is dominated by introduced (non-native) species. A total of 117 plant species were documented with only two being native (indigenous) and seven Polynesian introductions. Two vegetation types were encountered within the APE: 1) Cultivated Landscaping and 2) Alien Wet Forest. The following paragraphs describe the species found in each vegetation type. A list of plant species observed is included in Appendix C.

4.2.1 Cultivated Landscaping

Cultivated landscaping vegetation were observed in residential lots in the northern section of the APE on both the east and west sides of Kīlauea Avenue. Dominant trees include mango (*Mangifera indica*), ʻulu (*Artocarpus altilis*), avocado (*Persea americana*), lychee (*Litchi chinensis*), and Guaiana chestnut (*Pachira aquatica*). These larger trees were mainly restricted to the property with the large retaining wall at the northwest corner of Kīlauea Avenue and Haihai Street. The understory was dominated by ferns such as Asian swordfern (*Nephrolepis brownii*), laua'e haole (*Phlebodium aureum*), laua'e (*Microsorum grossum*), and *Christella parasitica*. The native whisk fern Moa (*Psilotum nudum*) was observed infrequently growing epiphytically in trees. The vines *Vigna hosei* and maile pilau (*Padaeria foetida*) were also observed in the understory along with the Polynesian intoduced kī (*Cordyline fruticosa*). Across Kīlauea Avenue to the east, several residential lots are included in the APE. The strip of yard frontage that is included in the APE harbors landscaping plants such as money tree (*Dracaena marginata*), song of India (*D. reflexa*), cypress (*Cypress* sp.), croton (*Croton* sp.), and aloe (*Aloe* sp.).

4.2.2 Alien Wet Forest

The Alien Wet Forest vegetation type is found on the remainder of the APE. Roadsides, the Four Mile Creek drainage, and the Pana'ewa Farm Lot planned for the laydown/staging area all harbor this weedy vegetation type. Larger trees documented include gunpowder tree (*Trema orientalis*), Octopus tree (*Heptapleurum actinophyllum*), Chinese banyan (*Ficus microcarpa*), African tulip (*Spathodea campanulata)*, *Melochia umbellata*, Moluccan albizia (*Falcataria moluccana*), and autograph tree (*Clusia rosea*). Various other trees and palms include king palms (*Archontophoenix alexandrae*), bingabing (*Macaranga mappa*), and kukui (*Aleurites moluccana*). Thick stands of waiawī or strawberry guava (*Psidium cattleyanum*) were observed scattered in the forested areas as well as at the northwestern corner on private property. One hala (*Pandanus tectorius*), a native species, was observed outside of the APE on the western side of Kīlauea Avenue across from Pana'ewa Farm lots scattered within the dense, secondary forest. In open areas along the roads and along forest edges, woody shrubs and grasses dominate the vegetation including, *Miconia crenata*, *Sphagneticola trilobata*, *Heterotis rotundifolia*, *Crotalaria* spp., carpetgrass (*Axonopus compressus*), and Guinea grass (*Megathyrsus maximus*). One plant of the indigenous pōpolo (*Solanum americanum*) was observed along the edge of the forested Four Mile Creek drainage.

Drainage area below the Four Mile Creek bridge included dense vegetation of previously mentioned species as well as paca fern (*Diplazium esculentum*), mule's-foot fern (*Angiopteris evecta*), yellow ginger (*Hedychium flavecens*), angel's trumpet (*Brugmansia x candida*), ʻōhiʻa ʻai or mountain apple (*Syzygium malaccense*), white shrimp plant (*Justicia betonica*), pink torch ginger (*Etlingera elatior*), maiʻa or banana (*Musa x paradisiaca*), latispatha heliconia (*Heliconia latispatha*), Job's tears (*Coix lachryma-jobi*), ʻape (*Alocasia cucullata*), and night cestrum (*Cestrum nocturnum*).

4.3 IPAC SUMMARY

The Official IPaC species list (Project Code: 2025-0085523) identified several plant and animal species protected by the ESA that may occur in the APE (PIWFO, 2026; Appendix D; and summarized in Table 2 below). However, no listed plant or animal species were observed during our site visit. There are no designated or proposed critical habitat within the APE.

Table 2: Listed Species on the IPaC Website that May Occur in the APE

Class	Common Name	Scientific Name	Hawaiian Name	Federal Listing	State Listing
Mammal	Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	ʻōpeʻapeʻa	Endangered	Endangered
Seabird	Band-rumped Storm-petrel	*Hydrobates castro*	ʻakēʻakē	Endangered	Endangered
Seabird	Newell's Shearwater	*Puffinus auricularis newelli*	ʻaʻo	Threatened	Threatened
Seabird	Hawaiian Petrel	*Pterodroma sandwichensis*	uaʻu	Endangered	Endangered
Waterbird	Hawaiian Stilt	*Himantopus mexicanus knudseni*	aeʻo	Endangered	Endangered
Waterbird	Hawaiian Coot	*Fulica alai*	ʻalae keʻokeʻo	Endangered	Endangered
Waterbird	Hawaiian Duck	*Anas wyvilliana*	koloa maoli	Endangered	Endangered
Waterbird	Hawaiian Goose	*Branta* (=Nesochen) *sandvicensis*	nēnē	Threatened	-
Reptile	Hawksbill Sea Turtle	*Eretmochelys imbricata*	honu ʻea	Endangered	Endangered
Plant	Alani	*Melicope zahlbruckneri*	alani	Endangered	-
Plant	Haiwale	*Cyrtandra nanawaleensis*	haiwale	Endangered	-
Plant	Hau Kuahiwi	*Hibiscadelphys giffardianus*	hau kuahiwi	Endangered	-
Plant	Nānū	*Gardenia remyi*	nānū	Endangered	-
Ferns, Allies	Lace fern	*Microlepia strigosa var. mauiensis*	-	Endangered	-
Ferns, Allies	*Deparia kaalaana*	*Deparia kaalaana*	-	Endangered	-

Source:
Pacific Islands Fish and Wildlife Office (PIFWO) 2026. Information for Planning and Consultation (IPaC). Project code 2025-0085523. Updated January 22, 2026. Accessible online at: https://ipac.ecosphere.fws.gov/.

5. Recommendations

Impacts from construction activities on terrestrial flora and fauna may occur during the stream crossing repairs, which may involve ground disturbance in or across the streams. Work will involve vegetation clearance, and debris accumulated on and around the bridge crossing will need to be removed. Recommendations to prevent impacts to Federally listed species are shown below.

5.1 HAWAIIAN HOARY BAT

Although not observed during the daytime surveys; the Hawaiian hoary bat may be present and active at night in the area due to its location and the presence of many large mature trees. Large trees near the stream within the APE will need to be removed for the bridge widening. If woody trees or shrubs 15 feet or taller are cleared when bats are pupping, there is a risk that adults may abandon their young or that young bats could inadvertently be harmed or killed during vegetation removal efforts. Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing (USFWS, 2023). Appropriate mitigation should be followed to avoid incidental take of bats, which include:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat breeding season (June 1 through September 15); and
- Barbed wire will not be used during and post-construction for fencing, including for the contractor staging and storage area.

5.2 HAWAIIAN WATERBIRDS

Although the APE does not contain designated critical habitat, IPaC lists four Hawaiian waterbirds that may be found within the APE: Hawaiian Coot, Hawaiian Duck, Hawaiian Goose, and Hawaiian Stilt. Effects on waterbirds are not expected if the following measures are taken:

- Avoid creating depressions that could collect standing water in or adjacent to the APE that may attract waterbirds;
- In areas where waterbirds are known to be present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on site.
- Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and socks or sandbags, and design and protect construction routes and staging areas to minimize soil erosion and deposits into stream channels.
- Provide project personnel and contractors with information about the potential presence of endangered species (identification cards, wildlife emergency contacts, etc.).
- As water resources are located within or adjacent to the project site, incorporate applicable water quality best management practices into the project design.
- In a situation when a threatened or sensitive animal species is observed in or within 100 feet of the APE, immediately cease construction within 100 feet of the animal species and do not approach. Continue work after the individual leaves the area of its own accord.

5.3 HAWAIIAN SEABIRDS

Three Hawaiian seabird species were identified by IPaC as occurring in the project area. These include two endangered species, the Band-Rumped Storm-Petrel and Hawaiian Petrel, and the threatened Newell's Shearwater. Nocturnal Hawaiian seabirds may transit portions of the action area where they could be harmed by artificial nighttime light sources. Artificial lights can disorient fledglings, causing them to fall to the ground (i.e., fallout) exhausted or increasing their chance of colliding with structures. Once on the ground, fledglings are unable to fly and die by vehicle strikes, predation, starvation, dehydration, and injuries. Because the fledging period for all nocturnal seabirds in Hawai'i differs among islands and bird species, the general fallout season throughout the State is considered from September 15 to December 15 (USFWS, 2023).

Streetlight design shall conform to AASHTO specifications and guides (Section 3.7.13 Codes and Standards), State of Hawai'i Department of Transportation requirements, and Hawaiian Electric design standards. The streetlights will be 30 feet above the roadway, and primary electrical lines will be 10 feet above the lighting fixtures. Lighting brightness will be based on current State of Hawai'i highway lighting requirements and Illuminating Engineering Society of North America recommendations for this type of road and zoning. Fixtures will be equipped with internal optics or reflectors that provide full cutoff distribution to ensure that no light is emitted above the horizontal plane and that the light is fully shielded. All existing lighting poles, bases, lamps, and luminaires shall be replaced with new equipment.

To avoid incidental effects on seabirds, the following measures are recommended:

- Construction work should be conducted during daylight hours only;
- If necessary, nighttime construction will be strictly avoided during the seabird fledging period, September 15 through December 15 (USFWS, 2023); and
- If night work is necessary, construction lights should not use Light Emitting Diode (LED) white light, and light fixtures used must be fully shielded with upglow (light shining above the horizontal) and reflective light (off the ground surface) must be eliminated.

5.4 HAWAIIAN HAWK

The Hawaiian Hawk or `Io *(Buteo solitarius)* has been delisted as Endangered by Federal agencies (USFWS, 2022) but is still listed by the State of Hawai'i as Endangered. The hawks can be found from sea level to above 8,990 feet (Pyle and Pyle, 2009). Hawaiian Hawks construct their nests approximately two months before laying eggs. Nest trees range from 32 to 79 feet high, and the nests are typically 11 to 60 feet above the ground. Nests are constructed on stable platforms such as on the top of birds-nest ferns or crotches within the branches of the trees (Griffin, 1998). Although not seen during the survey, the Hawaiian Hawk could potentially utilize trees in and around the APE for habitat and/or nesting. The following measures are recommended prior to and during construction to avoid impacts to the Hawaiian Hawk:

- A nest survey is recommended of the immediate area around the construction site during the Hawk breeding season (March through September) and at least 10 days before construction starts. The survey should be conducted by a qualified biologist using appropriate survey methods and should focus on the large trees that could provide nesting habitat (Gorressen et al., 2008).
- If active nest(s) are located, no construction should occur within 1,600 feet of the nest until the chicks fledge or the nest is abandoned.

- If Hawaiian Hawk individuals are detected in the area during construction, all activities within 100 feet of the bird should cease. Work may continue when the bird has left the area on its own.

5.5 VEGETATION

No threatened or endangered plant species were identified. All field equipment including tools, machinery, vehicles as well as footwear and clothing should be cleaned daily prior to and after field activities to control the introduction or spread of noxious plant species. Construction routes and equipment areas should be located along existing roads, walkways, and gravel areas to minimize impacts to vegetation and to control erosion. By incorporating the above mitigation measures, the project is unlikely to result in direct or indirect adverse impacts on sensitive species.

5.6 LITTLE FIRE ANT

An infestation of established little fire ants *(Wasmannia auropunctata)* was noted in the vegetated areas of the project area. This invasive ant species has been detected on Hawai‘i Island since 1999. The ants are extremely small, but their sting can cause painful welts and extreme itching. Care should be taken during any future surveys, clearance, or habitation that proper protective clothing is worn, and that movement of ants is limited by removing clothes and washing boots before working in other areas. Cleaning construction vehicles is also recommended when possible and/or when moving machinery between work sites.

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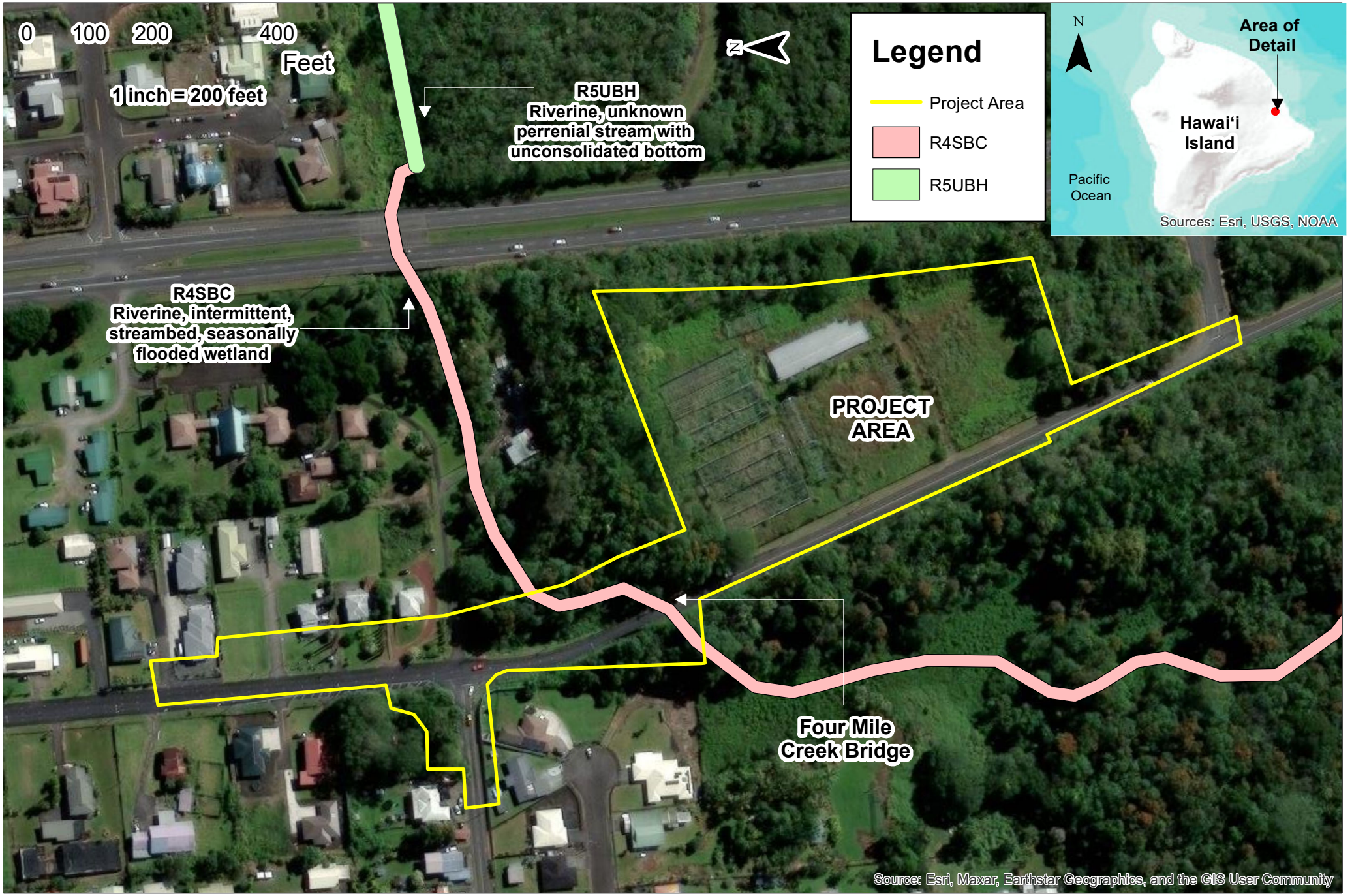
APPENDIX A
Figures

	Project Area Map	Figure 1
	Structural Engineering Services for the Four Mile Creek Bridge #22-7 Hilo, Hawai'i Island, HI	

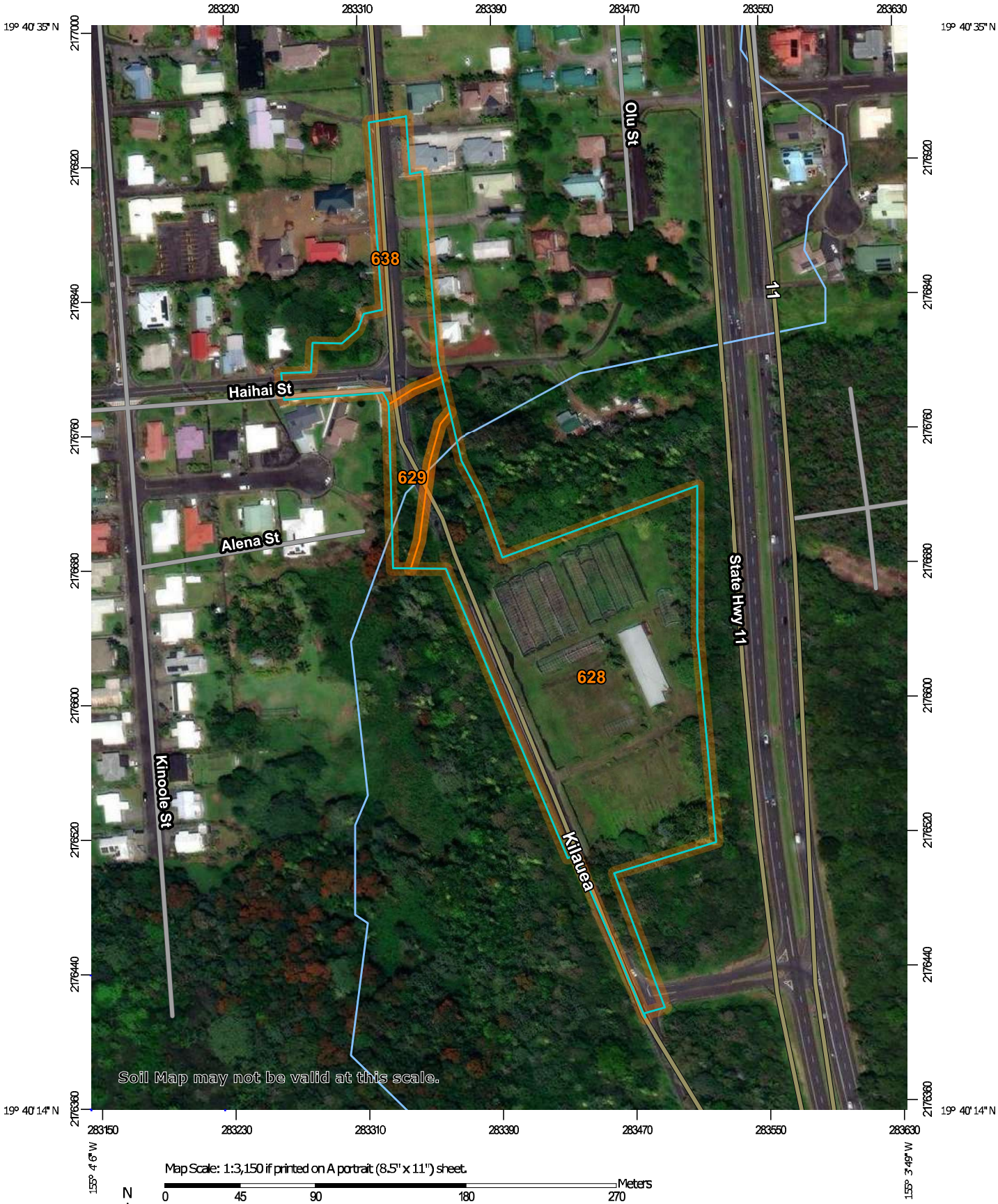
Figure 2: Intersection Exhibit



National Wetlands Index Classifications of the Project Area

Four Mile Creek Bridge (22-7) Replacement Project
Hilo, Hawai'i Island, HI

Soil Map—Island of Hawaii Area, Hawaii



Map Scale: 1:3,150 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 5N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Hawaii Area, Hawaii
Survey Area Data: Version 18, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 3, 2019—Jun 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
628	Papai extremely cobbly highly decomposed plant material, 2 to 10 percent slopes	6.9	75.4%
629	Panaewa very cobbly hydrous loam, 2 to 10 percent slopes	0.6	6.7%
638	Panaewa-Urban land complex, 2 to 10 percent slopes	1.6	17.9%
Totals for Area of Interest		**9.2**	**100.0%**

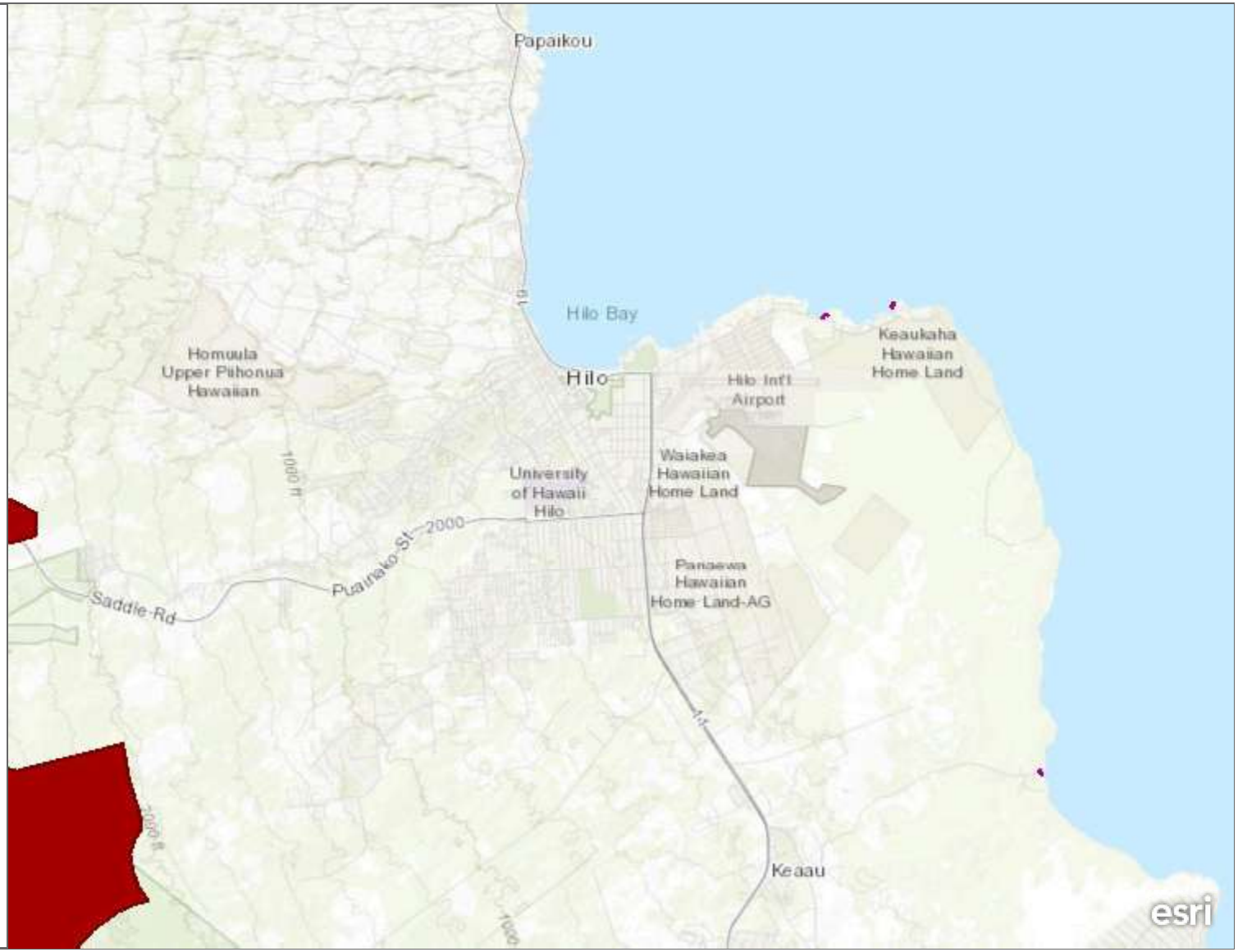
Critical Habitat for Threatened & Endangered Species [USFWS]

Final Polygon Features

Final Linear Features

Proposed Polygon Features

Proposed Linear Features



A specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

Esri, HERE, Garmin, USGS, NGA, EPA, USDA

APPENDIX B
Representative Photographs

Photo 1: Photo of the southern approach to the one-lane Four Mile Creek Bridge. Photo taken from Kīlauea Avenue, facing north. Vegetation surrounding the bridge is weedy, introduced species, such as Guinea grass (*Megathyrsus maximus*) and African tulip tree (*Spathodea campanulata*). Photo taken June 11, 2024.

Photo 2: Photo of the northern approach to Four Mile Creek Bridge. Photo taken facing south from the Kīlauea Avenue and Haihai Street Intersection. Larger trees on the southeast corner include African tulip and jackfruit (*Artocarpus heterophyllus*). Photo taken June 11, 2024.

Photo 3: Photo of the northwest corner lot of Haihai Street and Kīlauea Avenue intersection. The stone retaining wall will be removed for the signaled intersection. Photo taken June 11, 2024.

Photo 4: Photo of the area behind retaining wall on the NW corner of the intersection. The area is overgrown with trees including lychee (*Litchi chinensis*), breadfruit (*Artocarpus altilis*), mango (*Mangifera indica*), and introduced vines and ferns in the understory. Photo taken June 11, 2024.

Photo 5: Photo taken on the Four Mile Creek Bridge showing the vegetated makai drainage area, where the bridge will be widened. Photo taken June 11, 2024.

Photo 6: Photo showing typical weedy vegetation in the overgrown, abandoned greenhouses within the Panaewa Farm Lot to be used as a staging area. Photo taken June 11, 2024.

Photo 7: Entrance to the Panaewa Farm Lot Staging Area site from Kīlauea Avenue. Photo taken June 11, 2024.

Photo 8: Photo taken facing north with the Four Mile Creek Bridge in the background. The fenced Panaewa Farm Lot staging area parcel is to the right and Kīlauea Avenue is to the left. Photo taken June 11, 2024.

Photo 9: South end of the revised APE, on the east side of Kīlauea Avenue. Photo taken facing north. This image depicts part of the area added to the APE. Photo taken December 1, 2025.

Photo 10: South end of the revised APE, on the east side of the Kīlauea Avenue. Photo taken facing east. Image shows debris and failed boundary fence. This image depicts part of the area added to the APE. Photo taken December 1, 2025.

APPENDIX C
List of Plant Species Observed

APPENDIX C

List of Plant Species Observed

The following checklist is an inventory of plant species observed within the Action Area on 8 May 2024 by LeGrande Biological Surveys and Haley & Aldrich. The plant names are arranged alphabetically by family and then by species into each of four groups: Ferns and Fern Allies (Pteridophytes), Monocots, and Dicots. The taxonomy and nomenclature of the Ferns and Fern Allies follow Palmer (2002), while the gymnosperms and flowering plants, Monocots and Dicots, are in accordance with Wagner *et al*. (1990), Wagner and Herbst (1999), and Staples and Herbst (2005). Recent name changes follow the 2019 Hawaiian Naturalized Vascular Plants Checklist series (Imada 2019).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

   Cult = A cultivated plant; a species not known to be naturalized (spreading on its own) in Hawai‘i.

   Ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

   Nat = Naturalized, exotic plant introduced to the Hawaiian Island since the arrival of Cook Expedition in 1778, and well-established outside of cultivation

   Pol = Polynesian introduced; species that were introduced by the Polynesian migration to Hawaii before 1778, either intentionally or unintentionally, and are now naturalized.

Pteridophytes

Ferns and fern allies

Scientific Name	Common Name	Status
ATHYRIACEAE		
Diplazium esculentum (Retz.) Sw.	paca, vegetable fern	Nat
BLECHNACEAE		
Blechnum appendiculatum Willd.		Nat
CYATHEACEAE		
Sphaeropteris cooperi (Hook. Ex F.Muell.) R.M.Tryon	Australian tree fern	Nat
DAVALLIACEAE		
Davallia fejeensis Hook.	rabitt‘s foot fern	Nat
MARRATTIACEAE		
Angiopteris evecta (G.Forst.) Hoffm.	Mule‘s foot fern	Nat
NEPHROLEPIDACEAE		
Nephrolepis brownii (Desv.) Hovenkamp&Miyam.	Asian swordfern	Nat
POLYPODIACEAE		
Microsorum grossum (Langsd. & Fisch.) S.B. Andrews	laua‘e	Nat
Phlebodium aureum (L.) J. Sm.	rabbit’s-foot fern, *laua‘e haole*	Nat

PSILOTACEAE		
Psilotum nudum (L.) P.Beauv.	moa, whisk fern	**Ind**
PTERIDACEAE		
Adiantum raddianum C.Presl.	delta maidenhair	Nat
Pityrogramma calomelanos (L.) Link	silver fern	Nat
THELYPTERIDACEAE		
Christella parasitica (L.) H. Lév.	---	Nat

Gymnosperms

CUPRESSACEAE		
Cupressa sp.	cypress tree	Cult

Monocotyledons

ARACEAE		
Alocasia cucullata (Lour.) G.Don	‘ape, chinese taro	Pol
Dieffenbachia maculata (Loddiges) G.Don	spotted dumb cane	Nat
Epipremnum pinnatum cult*. aureum*	pothos	Nat
Monstera deliciosa L.	swiss cheese plant	Cult
Philodendron sp.	philodendron	Cult
ARECACEAE		
Archontophoenix alexandrae (F.Muell.) H.Wendl. & Drude	king palm, alexandra palm	Nat
ASPARAGACEAE		
Asparagus densiflorus (Kunth) Jessop	Asparagus fern	Nat
Cordyline fruticosa (L.) A. Chev.	*kī*	Pol
Dracaena marginata L.	money tree	Cult
Dracaena reflexa Lam.	song of India	Cult
ASPHODELIACEAE		
Aloe sp.	aloe variety	Cult
BROMELIACEAE		
Guzmania monostachia (L.) Rusby ex Mez	West indian tufted airplant	Nat
COMMELINACEAE		
Commelina diffusa N. L. Burm.	day flower	Nat
COSTACEAE		
Cheilocostus speciosus (J.Konig) C.Specht	crepe ginger	Nat
CYPERACEAE		
Cyperus brevifolius (Rottb.)Hassk.	*kili‘o‘opu,* green kyllinga	Nat
Cyperus haspan L.		Nat
Cyperus mindorensis (Steud.) Huygh	*kili‘o‘opu,* white kyllinga	Nat
DIOSCOREACEAE		
Dioscorea bulbifera L.	*hoi*, bitter yam	Pol
HELICONIACEAE		

Heliconia latispatha Benth.	latispatha heliconia	Nat
MUSACEAE		
Musa x paradisiaca L.	*mai'a,* banana	Pol
POACEAE		
Andropogon virginicus L.	broomsedge	Nat
Axonopus compressus (Sw.) P. Beauv.	carpetgrass	Nat
Bambusa sp.	bamboo	Nat
Coix lachryma-jobi L.	Job's-tears	Nat
Eragrostis cilianensis (All.) Vignoio ex Janch.	stinkgrass	Nat
Echinochloa colona (L.) Link	jungle-rice	Nat
Eleusine indica (L.)	wiregrass	Nat
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat
Melinis repens (Willd.) Zizka	Natal redtop	Nat
Oplismenus hirtellus (L.) P. Beauv.	basketgrass	Nat
Paspalum conjugatum Bergius	Hilo grass	Nat
Paspalum urvillei Steud.	vasey grass	Nat
Sacciolepis indica (L.) Chase	Glenwood grass	Nat
Setaria palmifolia (J.Konig) Stapf	palmgrass	Nat
Setaria parviflora (Poir.) Kerguélen	yellow foxtail	Nat
ZINGIBERACEAE		
Alpinia purpurata (Vieill.) K.Schum.	red ginger	Nat
Etlingera elatior Seems	pink torch ginger	Cult
Hedychium flavecens Carey ex Roscoe	yellow ginger	Nat

Dicotyledons

ACANTHACEAE		
Justicia betonica L.	white shrimp plant	Nat
Thunbergia fragrans Roxb.	white thunbergia	Nat
ADOXACEAE		
Sambucas mexicana Lam.	Mexican elderberry	Nat
ANACARDIACEAE		
Mangifera indica L.	mango	Nat
Schinus terebinthifolius Raddi	Christmas berry	Nat
ARALIACEAE		
Heptapleurum actinophyllum (Endl.) Lowrey & G.M. Plunkett	octopus tree	Nat
ASTERACEAE		
Ageratum conyzoides L.	*maile hohono*	Nat
Bidens alba (L.) DC. var. *radiata* (Sch.Bip.) Ballard ex Melchert	Spanish needle, beggartick	Nat
Bidens pilosa L.	Spanish needle, beggartick	Nat
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat
Crassocephalum crepidioides (Benth.) S. Moore	redflower ragweed	Nat
Emilia sonchifolia (L.) Raf. var. *sonchifolia*	Flora's paintbrush	Nat

Erechtites valerianifolia (Wolf) DC	fireweed	Nat
Galinsoga parviflora Cav.		Nat
Parthenium hysterophorus L.	false ragweed	Nat
Spagneticola trilobata (L.) Pruski	wedelia	Nat
Synedrella nodiflora (L.) Gaertn.	nodeweed	Nat
Youngia japonica (L.) DC.	Oriental hawksbeard	Nat
BEGONIACEAE		
Begonia cucullata Willd.	begonia	Nat
BIGNONIACEAE		
Spathodea campanulata P. Beauv.	African tulip tree	Nat
CAMPANULACEAE		
Hippobroma longiflora (L.) G.Don	star-of-Bethlehem	Nat
CANNABACEAE		
Trema orientalis (L.) Blume	gunpowder tree	Nat
CLUSIACEAE		
Clusia rosea Jacq.	autograph tree	Nat
CONVOLVULACEAE		
Distimake tuberosa (L.) Simoes&Staples	wood rose	Nat
CUCURBITACEAE		
Momordica charantia L.	balsam pear	Nat
EUPHORBIACEAE		
Acalypha wilkesiana	copper leaf, beefsteak	Cult
Aleurites moluccana (L.) Willd.	kukui	Pol
Chamaesyce prostrata	prostrate spurge	Nat
Croton sp.	ornamental croton	Cult
Euphorbia hirta L.	garden spurge	Nat
Macaranga mappa (L.) Müll. Arg.	bingabing	Nat
Phyllanthus debilis Klein ex Willd.	niuri	Nat
FABACEAE		
Chamaecrista nictitans (L.) Moench	partridge pea	Nat
Crotalaria sp.	rattlepod	Nat
Desmodium incanum DC.	Spanish clover	Nat
Falcataria moluccana (Miq.) Barneby & J.W.Grimes	Moluccan albizia	Nat
Mimosa pudica L. var. unijuga (Duchass. & Walp.) Griseb.	sensitive plant	Nat
Vigna hosei (Craib) Backer		Nat
LAMIACEAE		
Mesophaerum pectinatum (L.) Kuntze	comb hyptis	Nat
LAURACEAE		
Persea americana Mill.	avocado	Nat
LINDERNEACEAE		
Lindernia sp.	Lindernia	Nat
LYTHRACEAE		
Cuphea carthagenesis (Jacq.) J.F.Macbr.	tarweed	Nat

MALVACEAE		
Melochia umbellata (Houtt.) Stapf	---	Nat
Pachira aquatica Aubl.	Guiana chestnut	Nat
Sida acuta Burm.f. subsp. *carpinifolia*		Nat
Sida rhombifolia L.	Cuba jute	Nat
MELASTOMATACEAE		
Arthrostemma ciliatum Pav. Ex D.Don		Nat
Miconia calvescens DC.	velvet tree, purle plague	Nat
Miconia crenata (Vahl.) Michelang.	Koster's curse	Nat
Heterotis rotundifolia (Sm.) Jacq.-Fel.	Dissotis	Nat
MORACEAE		
Artocarpus altilis (Parkinson) Fosberg	ʻulu, breadfruit	Pol
Artocarpus heterophyllus Lam.	jackfruit	Nat
Ficus microcarpa L. fil.	Chinese banyan	Nat
MYRTACEAE		
Psidium cattleyanum	waiawi/strawberry guava	Nat
Psidium guajava L.	common guava	Nat
Syzygium malaccense (L.) Merr.&L.M.Perry	ʻōhiʻa ʻai, mountain apple	Pol
POLYGALACEAE		
Polygala paniculata L.	milkwort	Nat
PRIMULACEAE		
Ardisia elliptica Thunb.	Shoebutton ardisia	Nat
RUBIACEAE		
Paederia foetida L.	maile pilau	Nat
Spermacoce remota Lam.	buttonweed	Nat
SAPINDACEAE		
Litchi chinensis	litchi, lychee	Cult
SOLANACEAE		
Brugmansia x candida Pers.	angelʻs trumpet	Nat
Cestrum nocturnum L.	night cestrum	Nat
Solanum americanum L.	pōpolo	**Ind**
URTICACEAE		
Cecropia obtusifolia Bertol.	Guarumo, trumpet tree	Nat
Pilea microphylla (L.) Liebm.	artillery plant	Nat

APPENDIX D
USFWS IPaC Resource List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
Phone: (808) 792-9400 Fax: (808) 792-9580

In Reply Refer To: 01/23/2026 00:13:28 UTC
Project Code: 2025-0085523
Project Name: Four Mile Creek Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened and endangered species, as well as designated critical habitat that may occur within the boundary of your proposed project and that may be affected by project related actions. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Please contact the Service's Pacific Islands Fish and Wildlife Office (PIFWO) at 808-792-9400 if you have any questions regarding your IPaC species list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may adversely affect threatened and endangered species and/or designated critical habitat.

Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a Biological

Evaluation, similar to a Biological Assessment, be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment or Biological Evaluation are described at 50 CFR 402.12.

Due to the significant number of listed species found on each island within PIFWO's regulatory jurisdiction, and the difficulty in accurately mapping ranges for species that we have limited information about, your species list may include more species than if you obtained the list directly from a Service biologist. We recommend you use the species links in IPaC to view the life history, habitat descriptions, and recommended avoidance and minimization measures to assist with your initial determination of whether the species or its habitat may occur within your project area. If appropriate habitat is present for a listed species, we recommend surveys be conducted to determine whether the species is also present. If no surveys are conducted, we err on the side of the species, by regulation, and assume the habitat is occupied. Updated avoidance and minimization measures for plants and animals, best management practices for work in or near aquatic environments, and invasive species biosecurity protocols can be found on the PIFWO website at: https://www.fws.gov/office/pacific-islands-fish-and-wildlife/library.

If a Federal agency determines, based on the Biological Assessment or Biological Evaluation, that a listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/index.

Non-federal entities can also use the IPaC generated species list to develop Habitat Conservation Plans (HCP) in accordance with section 10(a)(1)(B) of the Act. We recommend HCP applicants coordinate with the Service early during the HCP development process. For additional information on HCPs, the Habitat Conservation Planning handbook can be found at https://www.fws.gov/sites/default/files/documents/habitat-conservation-planning-handbook-entire.pdf.

Please be aware that wind energy projects should follow the Service’s wind energy guidelines (http://www.fws.gov/windenergy) for minimizing impacts to migratory birds. Listed birds and the Hawaiian hoary bat may also be affected by wind energy development and we recommend development of a Habitat Conservation Plan for those species, as described above. Guidance for minimizing impacts to migratory birds for projects including communications towers can be found at:

- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers
- http://www.towerkill.com
- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow

Fish and Wildlife Coordination Act: Any modification to freshwater or marine waters of the U.S. including impounding, diverting, deepening, controlling, or modification for any other purpose requires a Fish and Wildlife Coordination Act (FWCA) consultation with the U.S Fish and Wildlife Service, State/ Territorial wildlife agency (State of Hawaii Division of Aquatic

Resources, American Samoa’s Department of Marine and Wildlife Resources, Guam’s Division of Aquatic and Wildlife Resources, or the Northern Mariana Island’s Division of Fish and Wildlife) and the National Marine Fisheries Service. The Pacific Islands Fish and Wildlife Office in Honolulu should be notified of a FWCA consultation request with a project description and any relevant biological information in order to expedite the appropriate level of coordination and consultation needs.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation actions that benefit threatened and endangered species into their project planning to further the purposes of the Act in accordance with section 7(a)(1). Please include the Consultation Tracking Number associated with your IPaC species list in any request for consultation or correspondence about your project that you submit to our office. Please feel free to contact us at PIFWO_admin@fws.gov or 808-792-9400 if you need more current information or assistance regarding the potential impacts to federally listed species and federally designated critical habitat.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

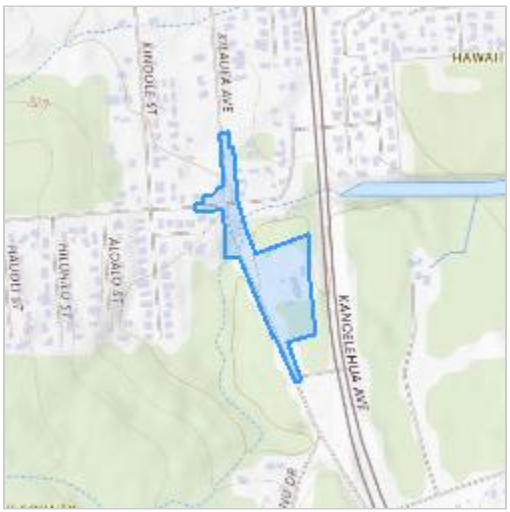
Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
(808) 792-9400

PROJECT SUMMARY

Project Code: 2025-0085523
Project Name: Four Mile Creek Bridge Replacement
Project Type: Bridge - Replacement
Project Description: The County of Hawaii Department of Public Works (DPW) proposes to replace the Four Mile Creek Bridge in Hilo on Hawaii Island to accommodate traffic demands, improve pedestrian facilities, and elevate the bridge to decrease the risk of flooding. The bridge is located near Kilauea Avenue and Haihai Street. The one-lane Four Mile Creek Bridge was constructed in 1964 and is located within the 100-year flood plain. The existing 20 feet 3 inches wide bridge and superstructure will be removed in its entirety and replaced with a single-span concrete girder bridge 68 feet and 2 inches wide raised above the 100-year flood elevation to reduce flooding hazards. The widened bridge will accommodate two through traffic lanes (north- and south-bound), one left turn lane (westbound), two 5-foot bike lanes/shoulders, two 3-foot buffers, and two 8-foot-wide raised sidewalks. At the Kilauea Avenue and Haihai Street intersection, a traffic signal will be installed, the east side of the intersection will be widened to accommodate the addition of the northbound and westbound left turn lane, and ADA-accessible curb ramps will be installed. Rip rap will be installed along the stream banks to protect the abutments.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@19.67363495,-155.0658847483963,14z



Counties: Hawaii County, Hawaii

ENDANGERED SPECIES ACT SPECIES

There is a total of 15 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Hawaiian Hoary Bat *Lasiurus cinereus semotus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/770
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6477.pdf

BIRDS

NAME	STATUS
Band-rumped Storm-petrel *Hydrobates castro*	Endangered

Population: USA (HI)
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1226
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6939.pdf

Hawaiian Coot (alae Ke`oke`o) *Fulica alai* — Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7233
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6934.pdf

Hawaiian Duck *Anas wyvilliana* — Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7712
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6934.pdf

Hawaiian Goose *Branta (=Nesochen) sandvicensis* — Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1627
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6925.pdf

Hawaiian Petrel *Pterodroma sandwichensis* — Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/6746
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6939.pdf

Hawaiian Stilt *Himantopus mexicanus knudseni* — Endangered

No critical habitat has been designated for this species.

NAME STATUS

Species profile: https://ecos.fws.gov/ecp/species/2082
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6934.pdf

Newell"s Shearwater *Puffinus newelli* Threatened
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2048
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/JO7DSTJYXBHW3BEDPDMCRJWD2E/documents/generated/6939.pdf

REPTILES

NAME STATUS

Hawksbill Sea Turtle *Eretmochelys imbricata* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/3656

FLOWERING PLANTS

NAME STATUS

Alani *Melicope zahlbruckneri* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7338

Haiwale *Cyrtandra nanawaleensis* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/9492

Hau Kuahiwi *Hibiscadelphus giffardianus* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/3458

Nanu *Gardenia remyi* Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5835

FERNS AND ALLIES

NAME STATUS

Deparia kaalaana Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9612

Microlepia strigosa var. mauiensis Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4737

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing

appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
'apapane *Himatione sanguinea* This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands. https://ecos.fws.gov/ecp/species/9659	Breeds Dec 1 to Jul 31
Hawai'i 'amakihi *Chlorodrepanis virens* This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands. https://ecos.fws.gov/ecp/species/9655	Breeds Nov 15 to Aug 15
Red-tailed Tropicbird *Phaethon rubricauda melanorhynchos* This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands. https://ecos.fws.gov/ecp/species/10563	Breeds Dec 15 to Oct 15
Wandering Tattler *Tringa incana* This is a Bird of Conservation Concern (BCC) throughout its range in Hawaii and the Pacific Islands. https://ecos.fws.gov/ecp/species/11941	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

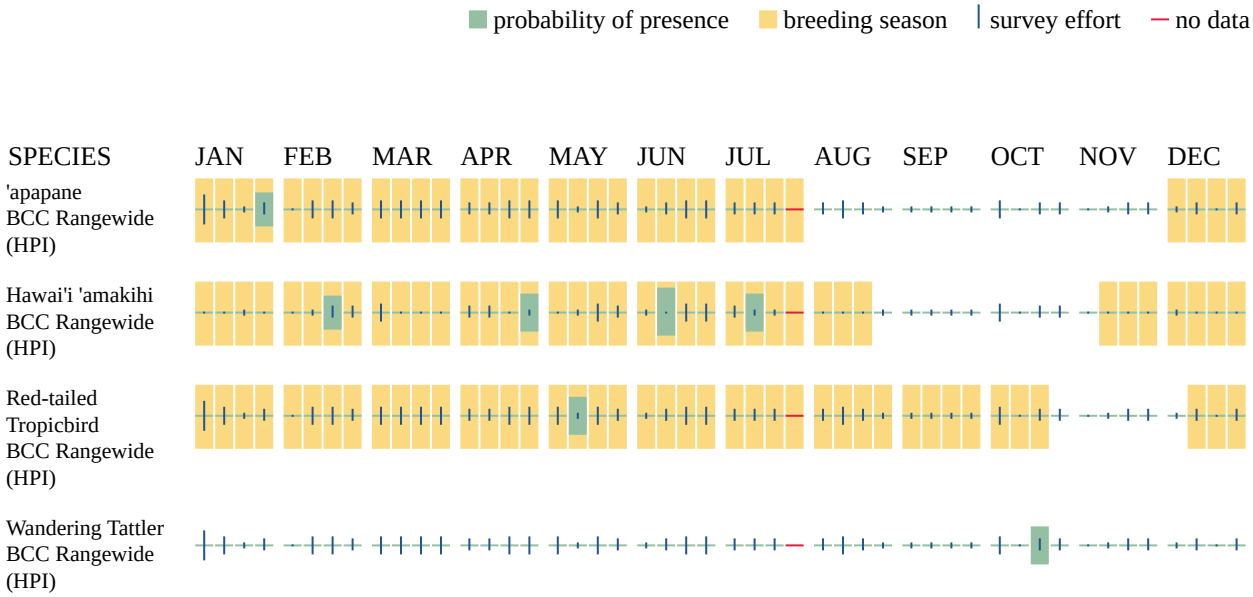
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPAC USER CONTACT INFORMATION

Agency: County of Hawaii
Name: Aurora Earley
Address: 500 Ala Moana Boulevard
Address Line 2: Suite 6-250
City: Honolulu
State: HI
Zip: 96813
Email aearley@haleyaldrich.com
Phone: 8088500310

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

APPENDIX C
Archaeological Literature Review and Field Inspection Report

Archaeological Literature Review and Field Inspection for the 4 Mile Creek Bridge Improvements Project, Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island TMKs: (3) 2-2-048:001 & 999 por.; (3) 2-4-045:999; 3-2-2-043:029, 030, 031, 032, 043, 102, 104, 105, 106, 125, 135, 136 & 999 por.; (3)-2-4-004:132 por.

Overview photo of Kīlauea Avenue showing the 4 Mile Creek Bridge, looking South

Prepared for:

consor

Prepared by:
Nathan J. DiVito, M.A. and
Trisha Kehaulani Watson, J.D., Ph.D.

HONUA CONSULTING

Honolulu, Hawai‘i
August 2025

Management Summary

This Archaeological Literature Review and Field Inspection (ALRFI) was conducted by Honua Consulting at the request of Consor Engineers, LLC in support of the Four-Mile Creek Bridge Improvements Project located in Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island, TMKs: (3) 2-2-048:001 & 999 por.; (3) 2-4-045:999; 3-2-2-043:029, 030, 031, 032, 043, 102, 104, 105, 106, 125, 135, 136 & 999 por.; (3)-2-4-004:132 por. The property measures approximately 10.18 acres (443,372 square feet [sq ft] or 41,191 square meters [sq m]) in size and is owned by the State of Hawa i‘i. The project area is located in south Hilo partially within the Waiākea Homesteads and includes portions of Kīlauea Avenue and Haihai Street, the 4 Mile Creek Bridge, and the former Pana‘ewa Farm Lots.

The goals of the Four-Mile Creek Bridge Improvements Project are to increase vehicle and pedestrian flow as well as hydraulic flow, to improve the intersection of Kīlauea and Haihai Street, and to increase the overall safety of the bridge crossing. The objectives of the ALRFI were to determine the project area’s land-use history, to relocate and identify any historic properties or component features in the project area, and to evaluate the proposed project’s potential effect on historic properties.

The road alignment and bridge that comprise the project area roughly follow the path of a traditional Hawaiian trail that would become the Volcano Road. Throughout much of the 1800s it was a horse trail and the main thoroughfare for foreigners visiting the Volcano House at Kīlauea Volcano. Construction of the 30-mile-long Volcano Road from Hilo to Kīlauea began in 1891 to the west of the project area and the carriage road was completed in 1894 and shortened the travel time to the volcano considerably. The 4 Mile Creek Bridge and the Waiākea Homesteads were completed in 1921 and the name of the road in this area was changed to Kīlauea Avenue. In 1955, Route 11 of the Hawaii Belt Road from Hilo to Kailua-Kona was constructed around the south side of the island and became the main route of transportation from Hilo to Volcanoes National Park. Construction of the new road rendered the portion of the Volcano Road containing the project area obsolete and it became a bypass road after that. The last known modifications to the bridge were completed in 1964 and included the addition of tee beams to the bridge deck that have not diminished its historic integrity.

Although no previous archaeological studies have been conducted that included the project area, the 4 Mile Bridge has been subject to an architectural evaluation as part of the State Bridge Inventories of 2014 and 2024 (WSP USA 2024). The 4 Mile Creek Bridge, State Bridge Number 001019201400400, was assessed for significance as eligible for listing on the National Register of Historic Places (NRHP) under Criterion c as a good example of a 1920s reinforced concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

The archaeological studies that have been conducted in the surrounding area are sparse due to development of the area prior to historic preservation becoming commonplace and they had negative results or documented plantation era infrastructure associated with the former Waiakea Sugar Plantation.

The archaeological field inspection consisted of a 100% pedestrian survey of the traversable portions of the project area. The project area was completely developed, and no historic properties were documented, and no significant artifacts or features were encountered during the field inspection. The lack of historic properties is due to the project area being almost entirely developed and within existing road right-of-ways, the 4 Mile Creek Bridge crossing, and the former Pana‘ewa Farm Lots.

This study is not an Archaeological Inventory Survey (AIS); however, it has been conducted according to standards outlined in Hawai‘i Administrative Rules (HAR) §13-276 for AIS studies; it is intended to assist with the project’s compliance with Hawai‘i Revised Statutes (HRS) 6E-8 and HAR §13-275 in consultation with the State Historic Preservation Division (SHPD). Fieldwork was performed under archaeological permit number 23-23 and 24-26 issued to Honua Consulting by the SHPD in accordance with Hawai‘i Administrative Rules (HAR) Chapter 13-282. Since no plans have been finalized for the 4 Mile Creek Bridge Improvements Project, recommendations include consultation with SHPD and an evaluation of historic buildings by a qualified architectural historian prior to development.

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Introduction

Project Background

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The goals of the Four-Mile Creek Bridge Improvements Project are to increase vehicle and pedestrian flow as well as hydraulic flow, to improve the intersection of Kīlauea and Haihai Street, and to increase the overall safety of the bridge crossing. The objectives of the ALRFI were to determine the project area’s land-use history, to relocate and identify any historic properties or component features in the project area, and to evaluate the proposed project’s potential effect on historic properties. This study is not an Archaeological Inventory Survey (AIS); however, it has been conducted according to standards outlined in Hawai‘i Administrative Rules (HAR) §13-276 for AIS studies; it is intended to assist with the project’s compliance with Hawai‘i Revised Statutes (HRS) 6E-8 and HAR §13-275 in consultation with the State Historic Preservation Division (SHPD). Fieldwork was performed under archaeological permit number 23-23 and 24-26 issued to Honua Consulting by the SHPD in accordance with Hawai‘i Administrative Rules (HAR) Chapter 13-282.

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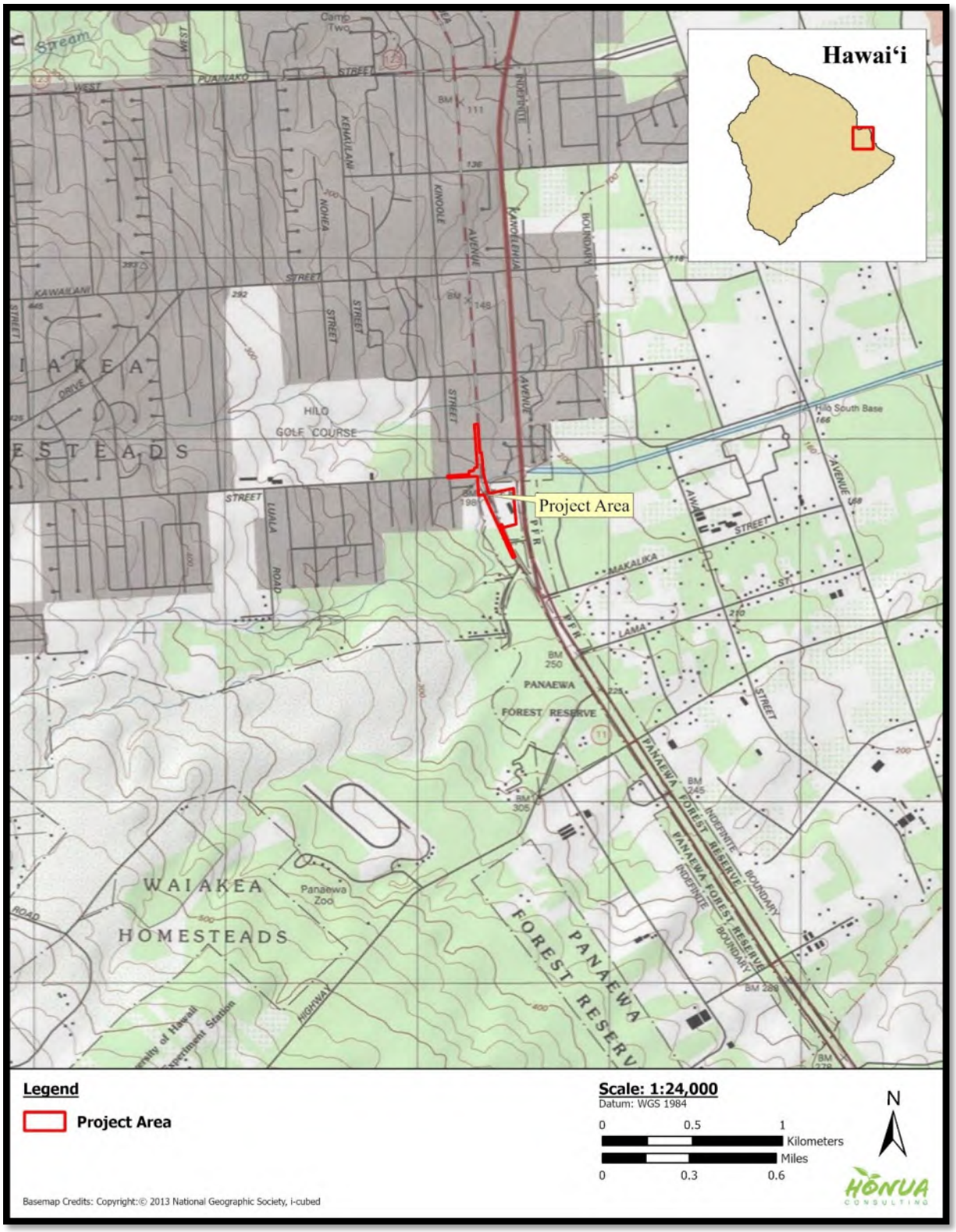

Figure 1. Portion of a 2013 U.S. Geological Survey (USGS) topographic map showing the project area (red)

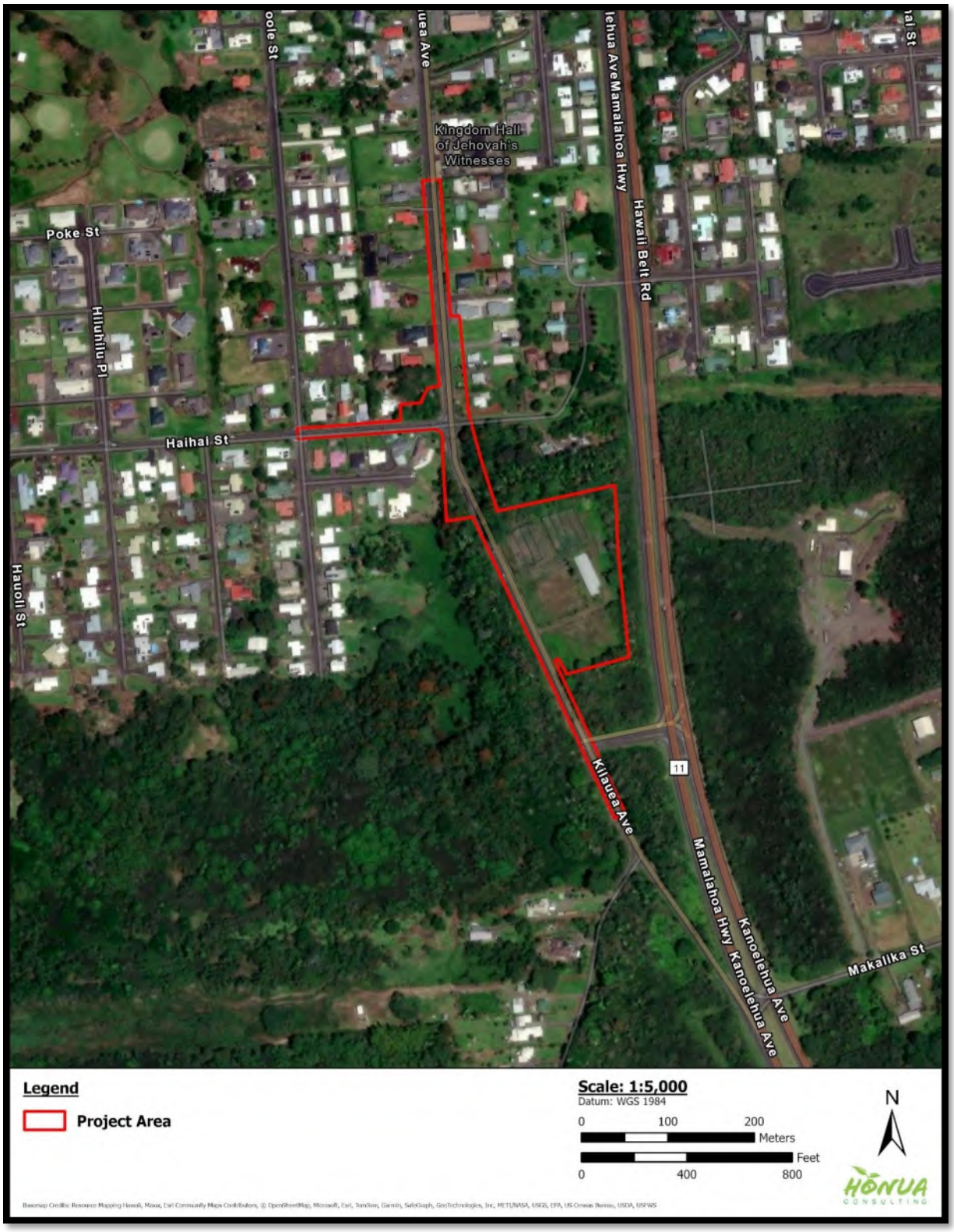

Figure 2. Aerial imagery showing the location of the project area (red)

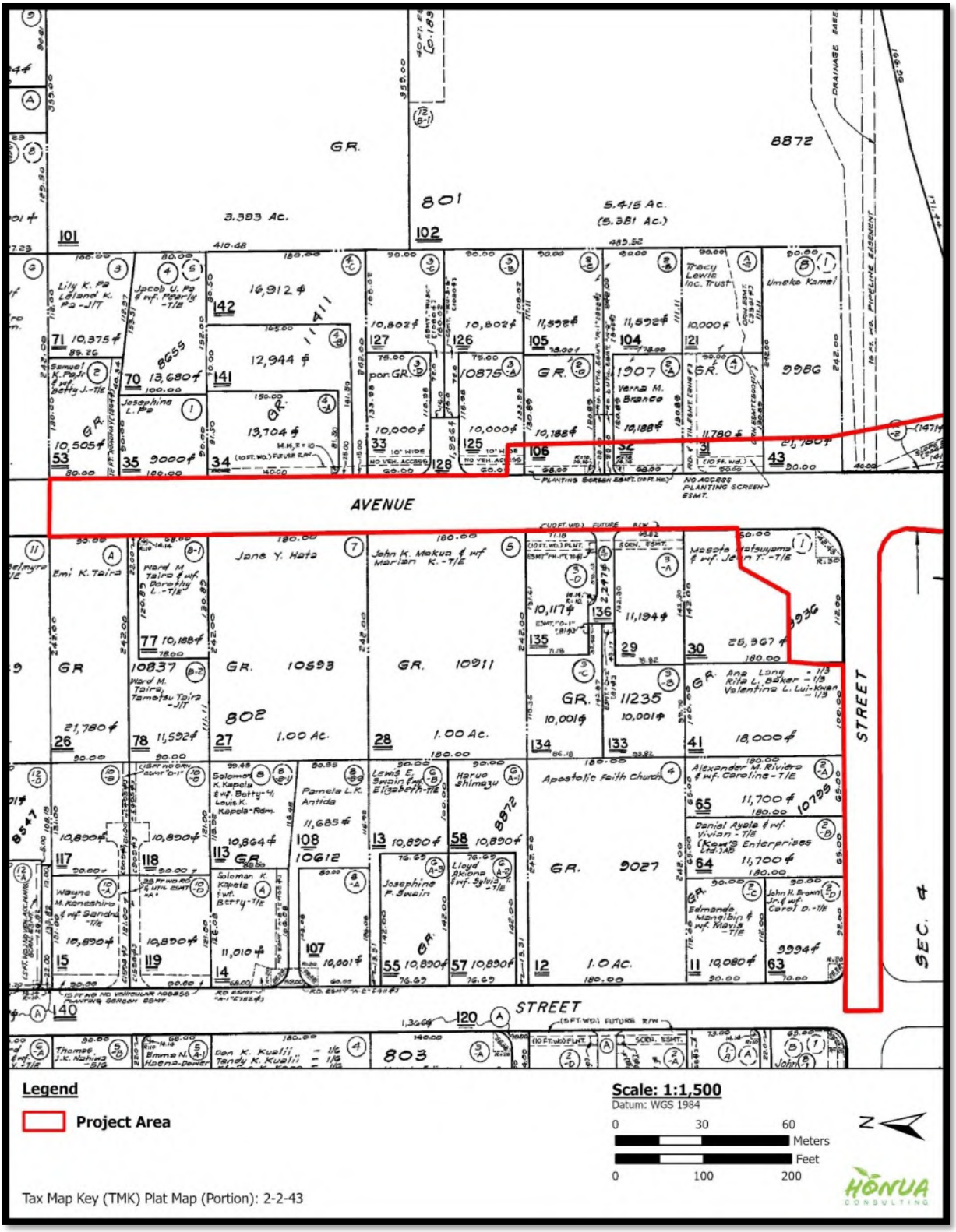

Figure 3. Portion of Tax Map Key (TMK): (3) 2-2-43 showing the northern portion of the project area (red)

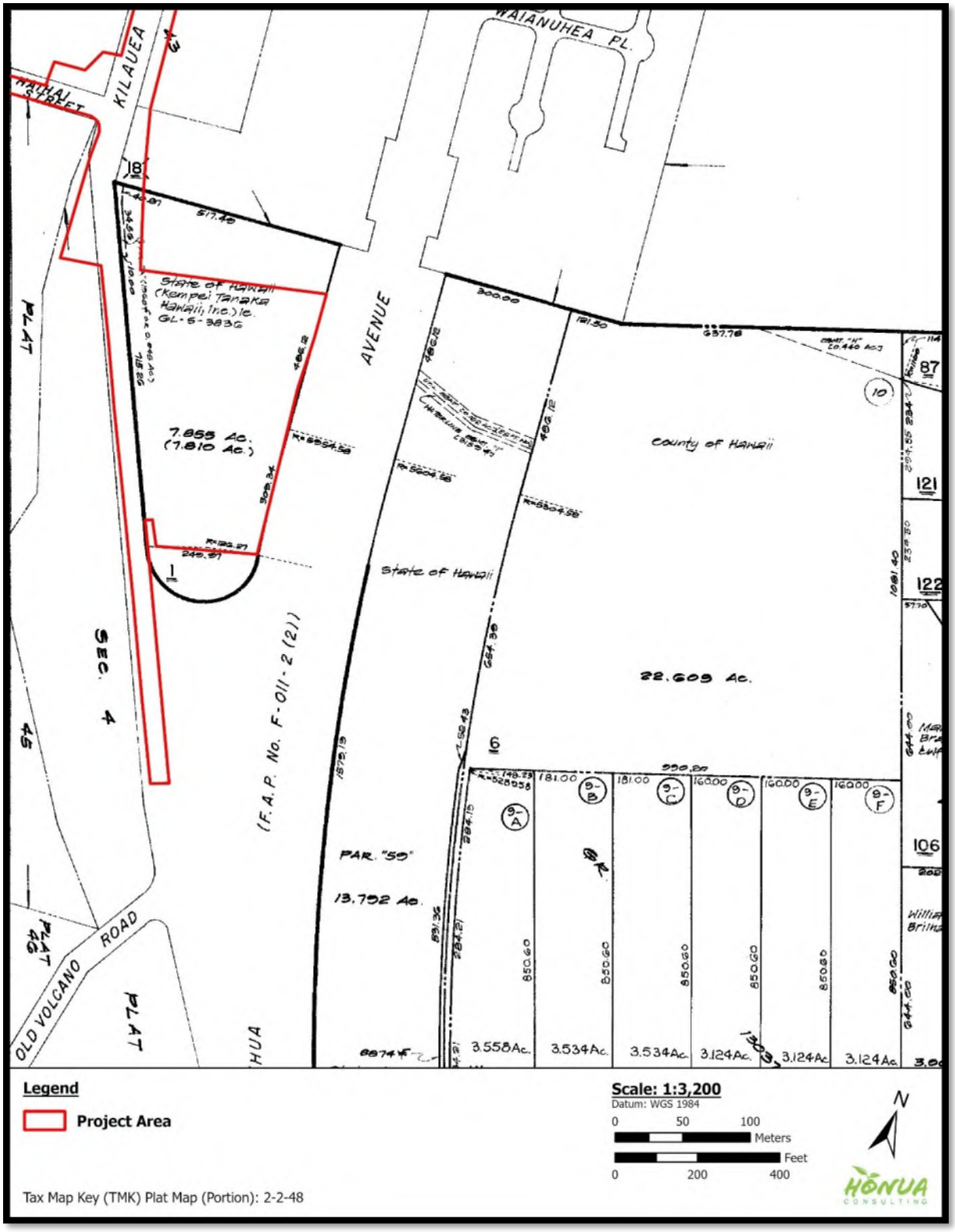

Figure 4. Portion of Tax Map Key (TMK): (3) 2-2-43 showing the southern portion of the project area (red)

Environmental Setting

Natural Environment

The elevation of the project area is slightly sloping, ranging from 57 meters (187 ft) above mean sea level in the north and 61 meters (200 ft) above mean sea level in the south. The project area is located approximately 5.6 kilimeters (3.5 miles) from the nearest coastline at Hilo Bay. It receives annual rainfall of approximately 400 centimeters (cm) (157 inches) of rainfall per year, with wetter months in the period of November through March (Giambelluca et al. 2013). The nearest drainage is the 4 Mile Creek which flows through the project area.

Three different soil/land types are present within the project area and include Papai extremely cobbly highly decomposed plant material (628), Panaewa very cobbly hydrous loam (629), and urban land complex (638) (Figure 5). The soil descriptions are based on the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Sato et al. (1973).

The portion of the project area comprising the creek includes Panaewa very cobbly hydrous loam on slopes ranging from 2 to 10 percent. Panaewa soils are found on the eastern windward mountain slopes of Mauna Loa and Kīlauea between the 0 and 1200 ft elevation and consist of shallow, moderately well drained soils formed in material weathered from volcanic ash overlying pahoehoe lava. The soil is moderately well drained, and permeability is moderate to the underlying bedrock. Soils of this type typically have natural vegetation consisting of hilo grass (*Paspalum conjugatum*), California grass (*Urochloa mutica*), lantana (*Lantana camara*), hāpuʻu treefern (*Cibotium glaucum*), uluhe fern (*Dicranopteris linearis*) and guava (*Psidium guajava*) and are generally used for pasture or for cultivating macadamia nut or papaya.

The northern portion of the project area consisted of Panaewa urban land complex on slopes ranging from 2 to 10 percent. The soils are the same as the Panaewa very cobbly hydrous loam soils except they are located in the urban environment, mostly underneath homesteads and the developed portion of Hilo Town.

The southern portion of the project area consisted of Papai extremely cobbly highly decomposed plant material on slopes ranging from 2 to 10 percent. Papai soils are found on the windward slopes of Mauna Loa and Kīlauea between the 0 and 1200 ft elevation and formed in a thin mantle of organic material overlying ʻaʻā lava. The soil is well drained, and permeability is very rapid to the underlying bedrock. Soils of this type typically have natural vegetation consisting ʻōhiʻa lehua (*Metrosideros polymorpha*), treefern (*Cibotium spp*.), and uluhe fern (*Dicranopteris linearis*) and are generally used for pasture or for cultivating macadamia nut or papaya.

Built Environment

The built environment of the project area was almost entirely developed and includes portions of two asphalt roadways, the 4 Mile Creek Bridge, and the graded and cleared former Panaʻewa Farm Lots. A metal entrance gate is used to access the former Panaʻewa Farm Lots from Kilauea Avenue and it is overgrown with abandoned farm buildings and modern irrigation infrastructure.

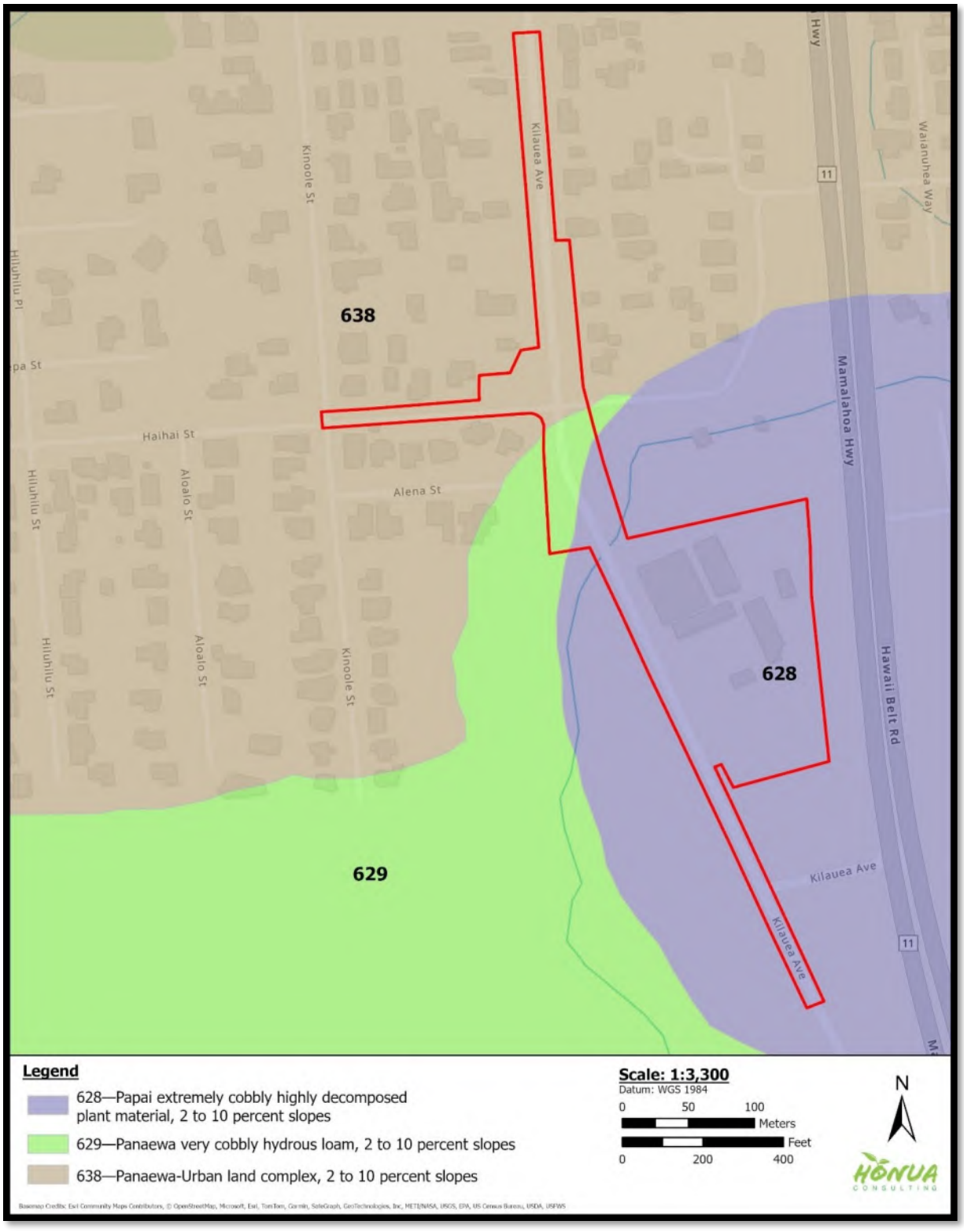

Figure 5. Portion of a 2013 USGS topographic map with soil series overlay showing anticipated soils within the project area (Foote et al. 1972)

Traditional and Historical Background

Background research was conducted using materials obtained from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting database. On-line materials consulted included the Ulukau Electronic Hawaiian Database (www.ulukau.com, Soehren 2002-2019), Papakilo Database (www.papakilodatabase.com), the State Library on-line (http://www.librarieshawaii.org/ Serials/databases.html), and Waihona ʻAina Mahele database (http://www.waihona.com). Hawaiian terms and place names were translated using the on-line Hawaiian Dictionary (Nā Puke Wehewehe ʻŌlelo Hawaiʻi, www.wehewehe.com) and *Place Names of Hawaii* (Pukui et al. 1974). Historic maps were obtained from the State Archives, State of Hawaiʻi Land Survey Division website (http://ags.hawaii.gov/survey/map-search/), and UH-Mānoa Maps, Aerial Photographs, and GIS (MAGIS) website (http://guides.library.manoa.hawaii.edu/magis).

Maps were geo-referenced for this report using ArcGIS Pro desktop. GIS is not 100% precise and historic maps were created with inherent flaws; therefore, geo-referenced maps should be understood to have some built-in inaccuracy.

Traditional Background

The history of Hawaiʻi is recorded through moʻolelo (oral-historical accounts) and early historical (i.e., written) records, historic maps, and land documents. The following provides a brief summary of moʻolelo and inoa ʻāina (place names) of the area and describes how the land has been utilized over time.

The bayfront was once part of an area known as Kaipalaoa (literally, "whale sea," according to Pukui et al. [1974:70]). This area was also known as an early residence of the Hilo chiefs who would gather with their people on the bayfront beaches to amuse and entertain themselves (Kelly et al. 1981:1). The shoreline here was known as a traditional canoe-landing spot as well as a surfing area (ibid., citing others). John Papa ʻĪʻī (1959:134) stated the surf spot at Waiākea was known as Kanukuokamanu.

Waiākea is generally associated with moʻolelo about the famous ʻUmi-a-Līloa (son of Līloa), the sixteenth-century supreme chief of Hawaiʻi Island (Kamakau 1961:15–17). Pukui et al. (1974:199–200) also describe a legendary man named ʻUlu (breadfruit in Hawaiian) who lived at Waiākea. Upon his death from starvation, he was buried near a running spring. The next morning a breadfruit tree laden with fruit was found at this spot, thereby ending the famine.

Waiākea, which is an unusually large ahupuaʻa compared with others in the region includes the eastern half of Hilo Bay all the way over to the coastline. In reference to the coastal and near-coastal areas of greater Hilo, in general, The Bishop Museum's *Hilo Bay: A Chronological History, Land and Water Use in the Hilo Bay Area, Island of Hawai'i* (Kelly et al. 1981) and other well-known sources (e.g., Handy 1940; Handy and Handy 1972; Pukui et al. 1974; Kamakau 1961) document an unusually rich and diverse cultural landscape that is full of wahi pana (legendary places), named locations, natural resources, and other landscape modifications such as archaeological sites that are of interest and value to Hawaiians. Many of these places and resources are associated with moʻolelo, or oral-historical references, related to Hilo's storied past.

Hilo Bay is widely recognized as one of the initial favored places where the first Hawaiians would have settled. Handy and Handy (1972:268) noted "In Hilo there was the bay and the mouth of the Wailuku River" when listing some of the earliest favored locations for the first settlers around the archipelago. At the same time, given the bay's shape/orientation and exposure to the northeast-facing trade winds, it has likely been susceptible to tsunami and other tidal surges since the earliest Hawaiian settlement. Handy and Handy (ibid.:538) write that "…it is also subject to violent oceanic storms and has many times in its history suffered semi devastation from tidal waves unleashed by earthquake action in the Aleutian area of the Pacific."

Handy and Handy (1972:538–9) discuss variation in Hilo's value to Hawaiians for practicing their cultivation/planting traditions in pre-Contact and early historic times:

> The population of Hilo was anciently as now concentrated mostly around and out from Hilo Bay… The Hilo Bay region is one of lush tropical verdure and beauty, owing to the prevalence of nightly showers and moist warmth which prevail under the northeasterly trade winds into which it faces…
>
> In lava-strewn South Hilo there were no streams whose valleys or banks were capable of being developed in terraces, but cuttings were stuck into the ground on the shores and inlets for many miles along the course of the Wailuku River far up into the forest zone. In the marshes surrounding Waiakea Bay, east of Hilo [town], taro was planted in a unique way known as *kanu kipi.* Long mounds were built on the marshy bottom with their surface two or three feet above water level. Upon the top and along the sides of these mounds taro was planted. Flood waters which occasionally submerged the entire mound are said to have done no harm, as the flow was imperceptible…
>
> On the lava-strewn plain of Waiakea and on the slopes between Waiakea and the Wailuku River, dry taro was formerly planted wherever there was enough soil. (brackets added)

A map depiction of the Hilo Bay area in 1825 (Registered Map 833), which is not reproduced here since it does not include the project area, provides the best general overview of what traditional (pre-Contact) Hawaiian land use once looked like at Hilo Bay.[1] The map shows that the entire bayfront—between the outlet of the Wailuku River at Piʻihonua Ahupuaʻa (western end of the bay) and the outlet of the Wailoa River/Waiākea Pond and Stream at Waiākea Ahupuaʻa (eastern end of the bay)—was once full of cultivated garden plots that were located in a relatively wet area among the "Royal Fish Pond" at Waiākea (sometimes labeled the "King's Fish Pond" on some historic maps) and other inland ponds, wetlands and waterways. This area of loko puʻuone (inland fishponds) was apparently spring fed (Kelly et al. 1981:11). It is difficult to see on the 1825 map, but there also appear to be scattered house sites along portions of the bayfront. The eastern end of the bayfront—where it meets the peninsula at Banyon Drive (Waiākea)—is labeled as a "good landing place."

The relatively high number of ahupuaʻa between the Wailuku River and Waiākea—at least seven (Piʻihonua, Punahoa 2, Punahoa 1, Ponahawai, Kūkūau 2, Kūkūau 1 and Waiākea), covering

[1] Registered Maps can be found using the Department of Accounting and General Services (DAGS) Land Survey Map Search, at http://ags.hawaii.gov/ survey/map-search/.

about a mile of shoreline (see, e.g., Kelly et al. 1981:Figure 1, p.2), is noteworthy. Such densely-packed ahupua‘a directly reflects the relatively high value of this area’s food resources—including its access to marine resources at Hilo Bay, varieties of limu (seaweed), abundant fresh-water, spring-fed fishponds, waterfowl and other, mauka resources.

Place Names of Waiākea

Waiākea translates as “broad waters” and it is worth noting that “wai” refers specifically to fresh water; and, thus, this name may reflect the extensive subterranean water sources just beneath the pāhoehoe flows in this area that Hawaiians valued and managed for subsistence and other purposes. (Pukui et al. 1974:219–220). In addition to the ahupua‘a name, several place names survived the passing of time in Waiākea. The place names mostly include natural features such as streams, hills, and islands, bird catching areas and forested areas along the Waiākea / Kūkūau ahupua‘a boundary, ponds and fishponds, plantation camps, and‘ili (land divisions) associated with various Māhele era Land Commission Awards (LCAs) and land claims. A list of place names for Waiākea is presented in Table 1

Table 1. List of Inoa ‘Āina (Place Names) in Waiākea ahupua‘a

Āhua	Ancient surfing area off Coconut Island in Hilo, meaning “heap” (Pukui et al., 1974, Soehren 2002)
‘Akahi Pond	A fishpond and described as an arm of Lokoaka, meaning “one” (Soehren 2002)
Alenoho	An ‘ili of Waiākea described in LCA 2281 Kaiana (Soehren 2002)
Anapuka	A cave, meaning “cave with holes” (USGS 1963, Soehren 2002)
Blonde Reef	Portion of reef fronting Hilo (Byron’s) Bay separating Kuhio Bay and Puhi Bay. Named for Lord Byron’s ship HMS Blonde which brought back the bodies of King Kamehameha II and Queen Kamāmalu, both of which had died of measles in England (USGS 1963, Soehren 2002)
Byron’s Bay	Hilo Bay, also known as Waiākea Bay, named for Lord (George Anson) Byron, captain of the HMS Blonde (Pukui et al. 1974, Soehren 2002)
Camp Two	Former plantation residential area located at an elevation of 110 ft (USGS 1963, Soehren 2002)
Camp Four	Former plantation residential area located at an elevation of 400 ft (USGS 1963, Soehren 2002)
Camp Six	Former plantation residential area located at an elevation of 620 ft (USGS 1963, Soehren 2002)
Cocoanut Island	A new name for Mokuola Island using the old spelling for coconut (USGS 1963, Soehren 2002)
General Lyman Field	The airfield that would become the Hilo International Airport (USGS 1963, Soehren 2002)
Haapoa	An ‘ili of Waiākea described in Claim 4785 to Nakai (Soehren 2002)
Halaniani	The northeastern point of Mokuola Island (Soehren 2002)

Inoa ʻĀina	Description
Haleolono Fishpond	A fishpond, meaning "the house of Lono" (Soehren 2002)
Halunui	An ʻili of Waiākea described in Claim 8081 by Hewahewea, meaning "greatly depleted" (Soehren 2002)
Hanahana	An ʻili of Waiākea described in Claim 4785 by Nakai, meaning "hot", "warm", or "vehement" or "sour" or "stinking" (Soehren 2002)
Hanalei Fishpond	Located on the Waiolama River on the boundary between Waiākea and Kukuau, a stone wall is present between the fishpond and the river that defines the boundary, meaning "crescent bay" (Soehren 2002)
Hauiki	An area of the ocean near the wharf at Hilo, meaning "small hau tree" (Pukui et al. 1974, Soehren 2002)
Hauna	A fishpond located on the inner side of Loko-Waka pond at Keaukaha, meaning "fishy smell" (Pukui et al. 1974, Soehren 2002)
Hilo Bay	Also known as Byron's Bay or Waiākea, possibly named for the first night of the new moon for a Polynesian navigator (USGS 1963, Soehren 2002)
Hilohanakahi	Name of the wahi pana of Hilo, named for a chief famous in song (Pukui et al. 1974, Soehren 2002)
Hinaʻauʻauwai	An ʻili of Waiākea described in Claim 4004 by Hale (Soehren 2002)
Hoʻā	An old road where bird catchers used to catch mamo, meaning "to set fire", "burn" or "ignite" (Soehren 2002)
Hoakimau Pond	A pond (USGS 1963, Soehren 2002)
Honohononui	An ʻili kūpono of Waiākea retained by Victoria Kamāmalu as LCA 7713 (Soehren 2002)
Hoʻolulu Park	A county park and stadium named for the chief believed to have hidden Kamehameha I bones near Kaloko, Kona and the father of Moʻoheau, meaning "to lie in sheltered waters" (Soehren 2002)
Huawai	A bathing place located along the Waiākea / Kūkūau boundary, meaning "gourd water container" (Soehren 2002)
Huia	A small kahawai (stream) located along the Waiākea / Kūkūau boundary (Soehren 2002)
Kaʻaipōpolo	A bird catching place located along the Waiākea / Kūkūau boundary, mentioned as a place where pōpolo now grows, meaning "the black nightshade food" (Soehren 2002)
Kahamouli	A place along the Waiākea / Kūkūau boundary (Soehren 2002)
Kahawa	A lauhala grove located along the Waiākea / Kūkūau boundary, meaning "the defiled" or "unclean" (Soehren 2002)
Kahuakāmoa	A cockfighting place located along the Waiākea / Kūkūau boundary, meaning "cockfighting arena" (Soehren 2002)

Inoa ʻĀina	Description
Kaikoʻo	A shopping mall built as part of the Hilo bayfront redevelopment project following the tsunami of 1960, meaning "strong sea" (Pukui et al. 1974,Soehren 2002)
Kailihelelei	A place with a grove of koa trees where bird catchers used to catch oʻo located along the Waiākea / Kūkūau boundary (Soehren 2002)
Kaʻīlio	A canoe building spot with koa and ʻōhiʻa lehua located along the Waiākea / Kūkūau boundary, meaning "the dog" (Soehren 2002)
Kalaeokōʻieʻie	A koa grove mostly destroyed by the lava flow of 1855 located at the junction of Piʻihonua and Waiākea (Soehren 2002)
Kālaihōlona	A canoe building place located along the Waiākea / Kūkūau boundary, meaning "unskilled carving" (Soehren 2002)
Kalanakama	The area where the old Volcano Road crosses the Waiākea / Kūkūau boundary (Soehren 2002)
Kalauokukui	A point shown on Registered Map 1561, meaning "the leaf of [the] candlenut" (Soehren 2002)
Kalepolepo	A fishpond destroyed by the Wailoa River Tributaries Flood Control Project, meaning "the dirt" (Soehren 2002)
Kalihi	An ʻili of Waiākea described in Claim 2327 by Barenaba, meaning "the edge" (Soehren 2002)
Kalulu	An ʻili of Waiākea described in Claim 3996 by Hewahewa, meaning "the shelter" (Soehren 2002)
Kamokoloa	An ʻili of Waiākea described in Claim 1738 by Kaluhikaua (Soehren 2002)
Kamokuna	An ʻili kūpono of Waiākea in an area with a rock marked with an "H", meaning "the severed portion" (Soehren 2002)
Kanakea Pond	The original name of what is now called Reed's Bay, meaning "wide stream" (Pukui et al. 1974, USGS 1963, Soehren 2002)
Kanekaulukaau	A planting area along the Waiākea / Kūkūau boundary (Soehren 2002)
Kanoa	A place located along the Waiākea / Kūkūau boundary (Soehren 2002)
Kanukuokamanu	A point located at the mouth of the Wailoa River and thought to be shaped like the beak of a bird, meaning "the beak of the bird" (Pukui et al. 1974, Soehren 2002)
Kapaieie	A famed heiau associated with the Hilo-Puna wars, ruins still present in 1907, (Thrum 1907, Soehren 2002)
Kapalahō Fishpond	A fishpond located adjacent to Kamokuna, meaning "the rotten" or "putrid" (Soehren 2002)
Kapuahiakaʻahumanu	A bird catching place located along the Waiākea / Kūkūau boundary, meaning "the fireplace of Kaʻahumanu" (Soehren 2002)

Inoa ʻĀina	Description
Kaulaʻināiwi Island	A small islet measuring 0.35 acre and 40 ft in elevation, a place known for drying the bones of chiefs, meaning "dry the bones" (Thrum 1907, Pukui et al. 1974, USGS 1963, Soehren 2002)
Kaunuapaʻakea	A place located along the Waiākea / Kūkūau boundary, meaning "the altar of Paʻakea (Soehren 2002)
Kawaimake	A stream mentioned in Claim 8802 to Kane, meaning "the water [of] death" (Soehren 2002)
Keaukaha	A village and residential area along the coast, meaning "the passing current" (USGS 1963, Soehren 2002)
Keawekapu	An ʻili of Waiākea mentioned in Claim 1E by Mahoe (Soehren 2002)
Kēōkea Point	A point, meaning "the white sand" (USGS 1963, Soehren 2002)
Kialoa	An ʻili of Waiākea mentioned in Claim 2603 by Napeahi (Soehren 2002)
Kilohana	An old resting place and hill along the Waiākea / Kūkūau boundary, meaning "lookout point" (Soehren 2002)
Kionakapahu Pond	A pond (USGS 1963, Soehren 2002)
Kōlea	An ʻili of Waiākea mentioned in LCA 1279 to Halai (Soehren 2002)
Kuahua	An ʻili of Waiākea mentioned in Claim 5018 by Keawe, meaning "hunch back" or "heap" or "pile" for the alternative spelling Kūāhua (Soehren 2002)
Kuaiaina	An area of pahoehoe and trees at the junction of two roads along the Waiākea / Kūkūau boundary (Soehren 2002)
Kūhiō Bay	A bay named for Prince Jonah Kūhiō Kalanianaʻole (USGS 1963, Pukui et al. 1974, Soehren 2002)
Kukuinui	A kukui nut grove located along the Waiākea / Kūkūau boundary, meaning "large candlenut" or "large light" (Soehren 2002)
Kulani Prison	A minimum-security state prison facility named for the nearby Kūlani cinder cone, meaning "like heaven" (USGS 1956, Soehren 2002)
Kumu	A spring located on the bank of the Waiolama River along the Waiākea / Kūkūau boundary, meaning "source", filled in (Pukui et al. 1974, Soehren 2002)
Kumuniu	A place with an old coconut tree located along the Waiākea / Kūkūau boundary (Soehren 2002)
Kupiʻinau	A place located along the Waiākea / Kūkūau boundary (Soehren 2002)
Lae Hala	A point in Waiākea named after the pandanus, meaning "pandanus point" (Soehren 2002)
Lae Kahaoi	A point in Waiākea (Soehren 2002)
Lapanaia	A place located along the Waiākea / Kūkūau boundary (Soehren 2002)
Lehia Park	A county beach park located at Leleiwi Point, meaning "skilled" (USGS 1963, Soehren 2002)

Inoa ʻĀina	Description
Leleiwi Park	An extensive county beach park located west of Leleiwi Point, meaning "bone altar" (USGS 1963, Pukui et al. 1974, Soehren 2002)
Leleiwi Point	A point where the fish heiau Pūhala once stood, meaning "bone altar" (USGS 1963, Pukui et al. 1974, Soehren 2002)
Liliʻuokalani Gardens	A park including a formal Japanese garden and Waihonu Pond, meaning "smarting of the high-born one" in reference to Kinaʻu suffering from eye pain around the time of her birth (USGS 1963, Soehren 2002)
Lokowaka	A pond mentioned in moʻolelo as a pool that Waka, a moʻo, dived into escape Pele, who was jealous of Waka's interest in a man, meaning "Waka's Pond" (Pukui et al. 1974, Soehren 2002)
Mahikea Island	An islet in a portion of Leleiwi Beach Park measuring approximately 1 acre and at the 40 ft elevation (USGS 1963, Pukui et al. 1974, Soehren 2002)
Mahohuli Fishpond	A fishpond located at Waiākea Park (Pukui et al. 1974, Soehren 2002)
Makaokū	The name of an ʻili kūpono of Waiākea returned by Kekauʻōnohi to the crown at the Māhele, meaning "eye of Kū" (Soehren 2002)
Makaokū Heiau	A luakini class heiau on the shore opposite coconut island, stones of the heiau were taken by Captain Spencer in the 1860s for construction of a boat landing (Thrum 1907, Soehren 2002)
Makau a Maui	A place name on Coconut Island in reference to the hook of Maui the demigod, meaning "Maui's hook" (Pukui et al. 1974)
Mauna Loa Boys School	An abandoned juvenile correctional facility (USGS 1956, Soehren 2002)
Middle Flume Spring	A spring present at the 2090 ft elevation that supplied water to the ʻŌlaʻa Flume (USGS 1963, Soehren 2002)
Mohouli Fishpond	A fishpond (USGS 1963, Soehren 2002)
Mokoula	The old name for coconut island in Hilo Bay, reference is made to the island being the puʻuhonua for the Hilo District, also associated with Makaokū Heiau, meaning "healing island" (Thrum 1907, Pukui et al. 1974, Soehren 2002)
Muanui	A bird catching place located along the Waiākea / Kūkūau boundary (Soehren 2002)
Nāhoanaomua	A place located along the Waiākea / Kūkūau boundary, meaning "the whetstones of Mua" (Soehren 2002)
Nāiheakealahou	An old water well and cemetery located along the Waiākea / Kūkūau boundary (Soehren 2002)
Nehuiki	An old canoe building place with large koa trees located along the Waiākea / Kūkūau boundary, meaning "small anchovy" (Soehren 2002)
Ohele Heiau	A luakini class heiau measuring 60 ft square and situated above the old Pitman store at Waiākea, destroyed (Stokes 1991, Soehren 2002)
Ohele	An ʻili of Waiākea mentioned in LCA 1738 to Kaluhikaua (Soehren 2002)

Inoa ʻĀina	Description
ʻŌhiʻaloloa	An ʻili of Waiākea mentioned in Claim 8802 to Kane, meaning "leaping ʻōhiʻa tree" in reference to a vine suspended from the tree being used as a swing (Soehren 2002)
Ohuliipe	A heiau and hill located along the Waiākea / Kūkūau boundary (Soehren 2002)
Onekahakaha Park	A county beach park, meaning "drawing" (USGS 1963, Soehren 2002)
Paʻiʻaʻahu	An ʻili of Waiākea mentioned in Claim 9982 by Levi, meaning "to put clothes to soak" (Soehren 2002)
Pāʻieʻie	An area of land near Panaʻewa, meaning "ieʻie vine enclosure" (Pukui et al. 1974, Soehren 2002)
Palaoa	The name of the head of the Waiolama River located along the Waiākea / Kūkūau boundary, meaning "whale" (Soehren 2002)
Panaʻewa	A wahi pana known as the legendary home of moʻo destroyed by Hiʻiaka (Pukui et al. 1974, Soehren 2002)
Papa-a-Hina	A flat stone on Mokoula where the umbilical cords of infants were hidden to protect them from rats, meaning "stratum of Hina" (Pukui et al. 1974, Soehren 2002)
Pikoilele	The old name for the Villa Franca subdivision in Hilo, meaning "flying tripping club" (Pukui et al. 1974, Soehren 2002)
Pilinui	A place located along the Waiākea / Kūkūau boundary (Soehren 2002)
Piʻopiʻo	An ʻili kūpono of Waiākea retained by Kamāmalu as LCA 7713, includes Hoakimau Pond (Soehren 2002)
Pōhakunui	A swale referred to as a kahawai located along the Waiākea / Kūkūau boundary, meaning "large stone" (Soehren 2002)
Poʻohina	The name of an old lava flow with scrubby short ʻōhiʻa, meaning "gray" or "white-haired" (Soehren 2002)
Puaʻakāheka	A sea pool to the right of the Mokuola landing (Pukui et al. 1974, Soehren 2002)
Puaʻaloa	An ʻili of Waiākea mentioned in Claim 8811 by Kilioe, meaning "long pig" (Soehren 2002)
Pūʻainakō	An ʻili of Waiākea mentioned in Claim 2274 by Kapuaakuni, meaning "like [sugar cane] begasse" (Soehren 2002)
Pūhala	A fish heiau once located near Leleiwi Point, meaning "pandanus tree" (Pukui et al. 1974, Soehren 2002)
Puhi	An ʻili of Waiākea mentioned in Claim 8868 by Kapaakiha (Soehren 2002)
Puhi Bay	A bay (USGS 1963, Soehren 2002)
Reeds Bay	A bay formerly known as Kanakea (USGS 1963, Soehren 2002)
Reeds Landing	A landing shown on Registered Map 1561 (Soehren 2002)
ʻUmilehu	A place located along the Waiākea / Kūkūau boundary (Soehren 2002)

Inoa ʻĀina	Description
Upeeloa	A lauhala grove with kahawai located along the Waiākea / Kūkūau boundary (Soehren 2002)
Waiahole Fishpond	A fishpond shown on Registered Map 1561 (Soehren 2002)
Waiākea	An ahupuaʻa in the South Hilo District returned by Kaunuohua to the crown at the Māhele, meaning "broad waters" (Pukui et al. 1974, Soehren 2002)
Waiākea Homesteads	A residential area developed by the Department of Hawaiian Homelands that makes up much of south Hilo (USGS 1963, Soehren 2002)
Waiākea Pond	A pond located at the upper part of the Wailoa River estuary, also referred to as a fishpond (USGS 1963, Soehren 2002)
Waiākea Stream	A stream that begins at the 800 ft elevation and enters the Wailoa River at sea level (USGS 1963, Soehren 2002)
Waiākea Uka	An aquifer recharge zone at the 1590 ft elevation that supplies the Hilo water system (USGS 1963, Soehren 2002)
Waihonu Pond	A pond, meaning "turtle water" (USGS 1963, Soehren 2002)
Wailoa River	An estuary of the Waiākea Stream, meaning "long water" (USGS 1963, Soehren 2002)
Wailoa River Park	A waterfront park (USGS 1963, Soehren 2002)
Wainaku	A pool of standing water along the Waiākea / Kūkūau boundary, meaning "bullrush water" (Soehren 2002)
Waiuli	A point near Leleiwi Point, meaning "dark water" (Soehren 2002)

Historical Background

Early Post-Contact Period

The traditional Hawaiian land tenure of Waiākea prior to the middle 1800s is summarized in Cachola et al. (1987:3),

> The ahupuaʻa of Waiākea and all the lands of Hilo were controlled at one time by Kalaniʻopuʻu who left them to this son Kīwalaʻō. When Kīwalaʻō died in 1782, the lands passed to his uncle Keawemaʻuhili, who lost them in battle to Keoua in 1790. With the defeat of Keoua in 1791 the lands went to Kamehameha and remained in his family until the Great Mahele of 1848.

When Captain George Vancouver arrived in the early 1790s, Kamehameha I was living at Waiākea (ibid.:8), apparently preparing (i.e., gathering provisions and materials to) to set out to capture Maui, Molokaʻi and Oʻahu in 1795. Kamehameha I was known to have frequented Kaipalaoa and used it both to land his canoe and to surf (ibid.). Kamakau (1961:188, 220, 386) mentioned a battle that took place at Kaipalaoa, as well as a nearby heiau of the same name where Liholiho's (son of Kamehameha I and second king of the unified Hawaiian Islands) piko (umbilical cord) was cut. Kaipalaoa was also famous for its niu (coconut palms) as memorialized by the ʻōlelo noʻeau (poetical saying):

Ka niu pe‘ahi kanaka o Kaipalaoa

The man-beckoning coco palms of Kaipalaoa

This saying is explained by Pukui (1983:162) as “The swaying palms that once grew at Kaipalaoa, Hilo, seemed to wave an invitation.”

Starting as early as 1822, missionaries came to the Hilo area to initiate their work, which was supported by Ka‘ahumanu, Liholiho (Kamehameha II), and Kaumali‘i (the former supreme chief of Kaua‘i); and, by 1825, a meeting house and missionary school began operating in the area (Kelly et al. 1981:26–29). Ka‘ahumanu gifted the land of Punahoa 2 to the missionaries Goodrich and Ruggles, who built missionary homes, meeting houses and churches as well as the Hilo Boarding School and Girls’ Seminary (ibid.:36).

The missionary William Ellis, based on O‘ahu, famously visited the island of Hawai‘i in 1823 and documented his observations, which included ethnographic commentary as well as natural history matters. He estimated the population of the Hilo Bay area was about 2,000 people living in 400 houses, which Kelly et al. (1981:19) believe is “probably close to the permanent population twenty years earlier” [i.e., around the turn of the century].

He also noted:

> …after passing about two miles through a wood of pretty large timber, came to the open country in the vicinity of Waiakea… we reached the house of chief… Maaro [Malo]. (ibid.) (brackets added)

Ellis referred to the greater inland area south of Hilo, including Waiākea, as:

> … primarily hala forest, and bushes with some large timber (probably ‘ohi‘a). Local residents describe the landscape as being more open in the first half of the century than it is today due to the introduction of aggressive exotic plants. (ibid.)

According to Cachola et al. (ibid.), other than the Malo family, which had homes at “Waiuli, Koki and Waiokawa,” other local families in historic times included “Pakele at Papa‘i” and “Ka‘a‘awe at Paukupahu.”

A major tsunami that struck Hilo in 1837 “caused some loss of life and severe damage to fishponds and taro patches” (ibid.:44). As recounted by the missionary Rev. Titus Coan, “everything not more than fifteen or twenty feet above high-water mark [was swept] into indiscriminate ruin” . . .and “only thirteen were drowned.” Despite this, the population of greater Hilo apparently had grown by the 1840s to about 10,000 people (ibid.).[2]

An 1841 map depiction of Hilo Bay (in Fitzpatrick 1987), which is not reproduced here since it does not include the project area, was produced by the famous Wilkes scientific and surveying expedition of the Hawaiian Islands. It includes relatively little detail inland of the depth-charting of the bay; however, it does show that the several structures of the “Town of Hilo”—and others going over to the King’s Pond at Waiākea—are set back some distance from the bayfront. This set up, no doubt, reflects the fact that the bayfront in its natural state, and lacking the hardscape (boulder) reinforcement it currently has, was always susceptible to flooding (tidal surges, tsunami,

[2] Numerous other tsunamis and damaging tidal surges have hit Hilo over the years, including one in 1868, 1877 and 1892 (Kelly et al. 1981:71), in addition to the cataclysmic one in 1946.

etc.). Quoting Commander Charles Wilkes, whose scientific and mapping expedition visited Hilo in 1840–1841, Hilo by this time was a:

> …straggling village, and is rendered almost invisible by the luxuriant growth of the sugarcane, which the natives plant around their houses. … The whole settlement forms a pretty cluster; the paths and roadsides are planted with pine-apples; the soil is deep and fertile, and through an excess of moisture, yields a rank vegetation. … Many of the native houses are surrounded with bread-fruit and cocoa-nut trees, and have a fine view of the bay. (ibid.:53)

The Māhele (1847-1855)

In the years between 1847 and 1855, the lands of Hawai‘i were divided under the Māhele. Prior to Western contact, all land in the Hawaiian Islands was held by the chiefs as descendants of the gods—no one owned the land. After Western contact, some foreigners were granted gifts of land for services to Kamehameha I and/or his heirs. With a growing number of foreigners arriving and establishing business interests or in service of the mission stations, many petitioned for fee-simple title to land upon which they lived or worked. In 1848, Kauikeaouli-Kamehameha III agreed to the Māhele ‘Āina, which defined the land interests of the King, some two hundred and fifty-two high-ranking Ali‘i and Konohiki (including several foreigners who had been befriended by members of the Kamehameha line), and the Government.

As a result of the Māhele, all lands in the Kingdom of Hawai‘i and associated fisheries came to be placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) Konohiki Lands. The “Enabling” or “Kuleana Act” of the Māhele (December 21, 1849) further defined the framework by which hoa‘āina (native tenants) could apply for and be granted fee-simple interest in “Kuleana” lands (cf. Kamakau, 1961:403). The Kuleana Act reconfirmed the rights of hoa‘āina to: access, subsistence and collection of resources from mountains to the shore, which were necessary to sustain life within their given ahupua‘a. Though not specifically stated in this Act, the rights of piscary (to fisheries and fishing) had already been granted and were protected by earlier Kingdom laws. Land Commission Awards (LCAs) were awarded to natives who actively lived on and worked their lands and generally contained information on how the land was utilized and its contents.

According to Kelly et al. (1981:40),

> Waiākea, which had been retained as a personal land by Kamehameha I . . . was at some later time held by the chiefess Ka-unu-o-hua, a granddaughter of Keawe-mau-hili . . . She surrendered it in the Māhele of 1848, and it became a Crown Land . . . [see Board of Commissioners 1929:26]

No Land Commission Awards (LCAs) were awarded in the current project area. It is important to note that such cases where no LCAs were awarded, particularly in Crown Lands and those awarded to the Ali‘i Nui (high chiefs), do not imply a lack of Native Hawaiians living on the landscape in the middle 1800s. It simply means there are no records of land tenancy by maka‘āinana (commoners), which could reflect numerous other socio-political factors (e.g., a lack of funds to pay for surveys and filing of documents by commoners wishing to make a claim).

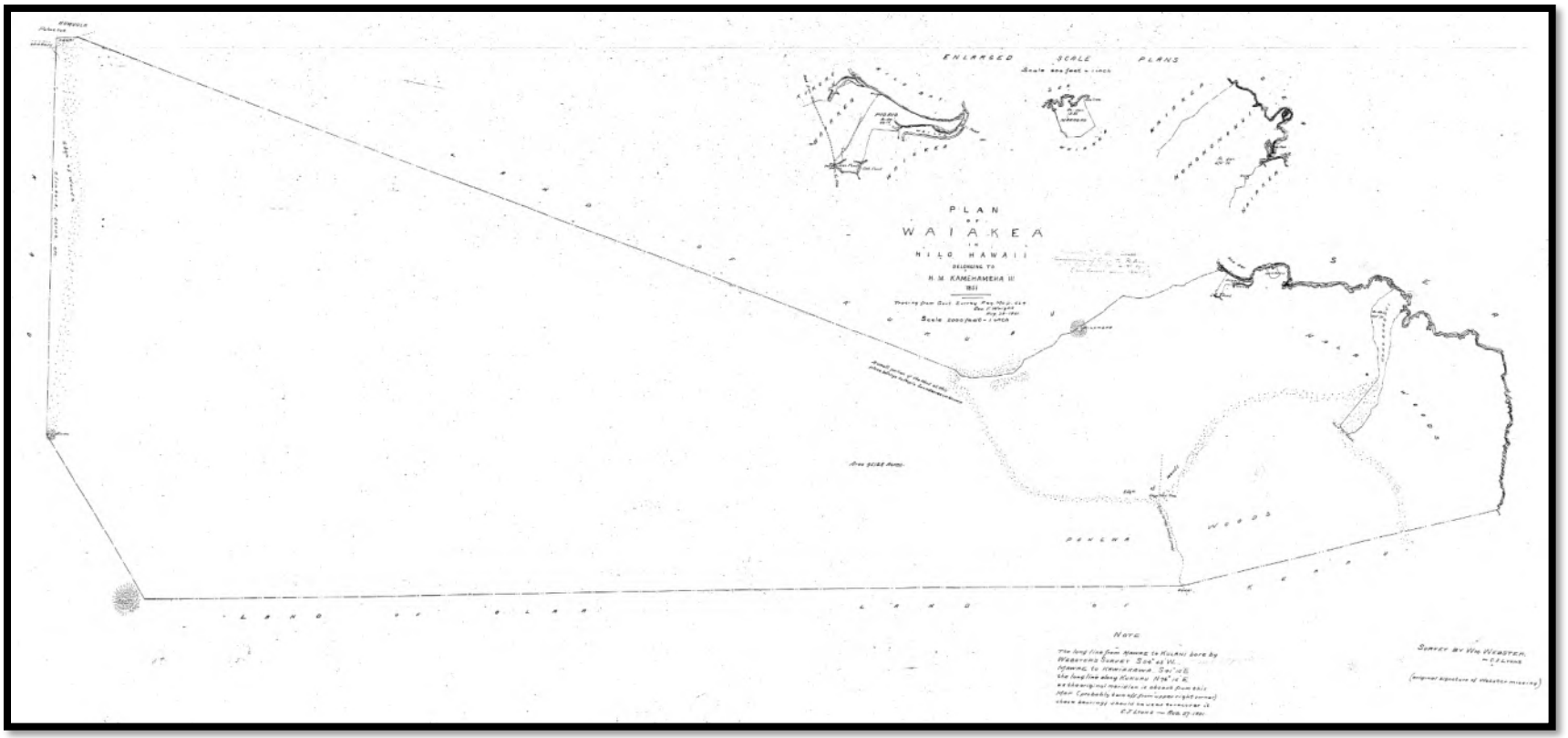

Figure 6. An 1851 Hawaiian Government survey map of Waiākea ahupua‘a (Webster 1851)

Mid to Late 19th Century Development

Kelly et al. (1981:51) refer to the years between 1840 and 1898 as the period of Americanization of Hilo—a time when U.S. businessmen's economic interests came to dominate the windward side of Hawai'i Island—in particular, the advent of commercial sugar cane operations. From the middle 1800s, and continuing into modern times, much of the greater Hilo Bay area was part of a series of vast commercial sugar cane operations that extended all the way up the Hāmākua coast and down to Puna.

In 1861, S. Kipi was given a 5-year lease to the lands of Waiākea, including the project area, by Kamehameha IV for use as pastureland at a cost of $600 per annum.

In 1875, the Reciprocity Treaty of 1875 was negotiated between the Kingdom of Hawaii and the United States. It was a free trade agreement between the United States and the Kingdom of Hawaii that granted duty-free access for Hawaiian products, particularly sugar, in exchange for special economic privileges for the United States, including a naval refueling base at Pearl Harbor. The treaty was a catalyst for increased land consolidation, plantation development, and immigration of plantation workers to the Hawaiian Islands through the end of the 20th century.

In 1877, yet another tsunami caused extensive damage in Hilo between the Wailuku side of the bay (12.25-foot surge) and Waiākea (16-foot surge):

> All houses within a hundred yards of the water at Waiākea were destroyed, along with the steamboat wharf and the stone houses, Spencer's storehouse, and the bridge across the stream. . . Five lives were lost. On the Wailuku side, the water washed into the stores and washed away the stone wall *makai* of the wharf. (ibid.:72)

In 1879, Theophilus Harris Davies and Alexander Young founded the Waiakea Sugar Mill Company and the Waiakea Sugar Plantation and began leasing R. Lyman's lands in Waiākea. The mill started out small and was situated one mile south-southeast of Hilo. The first descriptions of the Waiakea Sugar Mill Company and the Waiakea Sugar Plantation were included in "An Account of the Sugar Plantations and the Principal Stock Ranches on the Hawaiian Islands" by Bowser (1880) and are presented below:

Waiakea Sugar Mill Company

> Waiakea, Volcano Road, one mile from Hilo, Theodore H. Davies and Alexander Young, Proprietors; C.C. Kennedy, Manager; Theodore H. Davies, Agent, Honolulu; employ about 100 men; capacity of mill, about 12 tons, with all the modern improvements. (Bowser 1880:411)

Waiakea Sugar Plantation

> Waiakea, one mile from Hilo, Theodore H. Davies and Alexander Young, Proprietors; C.C. Kennedy, Manager; C.H. Richardson & Co., renters or planters on shares with Waiakea Mill Company; Theodore H. Davies, Agent, Honolulu. Plant 350 acres, all cultivated. For some reason best known to themselves, the publisher Directory was put off and referred to one and the other, therefore could not get a correct account of the mill or the plantation. (Bowser 1880:411)

In 1888, a new 30-year lease was negotiated by the Waiakea Sugar Plantation starting on June 1, 1888, and ending on June 1, 1918. It included 96,988 acres to be leased at a price of $2000 dollars annually. In 1889, the "Road Board" began work on canals and roads around and through the various wetlands just mauka of the bayfront, most especially over to Waiākea, in order to facilitate development (i.e., improve the drainage) of this area into an expanded Hilo town. Other modern conveniences, such as piped fresh water, were first introduced to Hilo in 1890 (ibid.:66). The construction of the 30-mile-long Volcano Road from Hilo to the Volcano House started in 1891 and was completed in 1894 and shortening the travel time to the volcano considerably (Figure 7).

Figure 7. An 1894 photo showing the 14-mile marker of the Volcano Road (Bertram 1894, courtesy of the Digital Archives of Hawai'i Photograph Collection, Ref. PPBER-2-11-009)

20th Century and Modern Development

The commercial and residential development of the area known as Hilo town continued through the first half of the 20th century. This was due to the success of the sugar plantations and an influx of Japanese workers that began in the 1890s and continued through the next couple decades. Given the bayfront's exposure and susceptibility to tidal waves, surges and storm events that frequently transformed the beach—sometimes removing sand and sometimes depositing it well inland, the shoreline was eventually hardened with boulder retaining walls starting around 1920 (this was also related to the need to support the railroad tracks, which were built on sand).

Around the same time Prince Kūhio Kalaniani'ole developed a plan to resettle Hawaiians back on the land which eventually led to the passing of the Hawaiian Homes Commission Act by the

United States Congress in July of 1921. The act set up a commission and provided the capital, land, and a basic plan of action for resettlement. The homestead laws of the Territory of Hawai‘i required the government to survey and divide unoccupied public lands where at least 25 applications to homestead had been received. Due to this, the Waiakea Sugar Company lease was allowed to expire in 1918. This resulted in the development of large swaths of government land for homesteads in Waiākea and Keaukaha. The lands of Waiākea formerly under lease were divided into 216 cane and 231 house lots. On February 17, 1919, and February 3, 1921, drawings were held to determine which of the 3,000 applicants would receive lots. A portion of the project area is situated within four lots located in the southernmost portion of the Waiākea Homesteads along Kilauea Avenue.

Although good intentioned, the creation of the Waiākea Homesteads led to significant losses of capital for all parties involved. The homesteaders secured a 60/40 contract to supply sugar cane to the Waiakea Sugar Company in June of 1919. From the beginning, the homesteaders faced a lack of capital, high labor costs, and difficulties cultivating and transporting crops. This was in addition to disagreements and contractual misunderstandings with the mill company. Due to this, many of the homesteaders went into debt and the courts were mired with litigation against the mill throughout the 1920s. Following complaints to the governor, a16-year contract between the mill and the homesteaders was reached in 1922 but offered no relief. The homesteaders once again petitioned the governor and the legislature and in 1925 the three-member Waiakea Homestead Commission was created to investigate the claims. The commission recommended the creation of a new more powerful commission in 1927, and a new agreement was reached between the homesteaders and the mill company in 1928 (Maly). These events restricted the projected growth of the economy of Hilo and negatively impacted operations and revenue for the Waiakea Mill Company, the livelihood and finances of the homesteaders, and tax revenue generated for the territorial government. Due to the many problems the Waiakea Plantation faced, including pests, they were forced to close in 1937.

In the mid-20th century, the economy and town of Hilo were devastated by a series of catastrophic events. Initially, a small blow was dealt to the town when the United States entered World War II due to the bombing of Pearl Harbor on December 7, 1941. This led to the displacement of Japanese families and business owners of Hilo that were sent to internment camps. Probably the most devastating blow was dealt when a large tsunami hit Hilo Bay on April 1, 1946, killing nearly 100 people and destroying much of Hilo’s bayfront. The town was rebuilt and the residential homestead areas expanded considerably throughout the 1950s. On May 22, 1960, the bayfront was hit again with another tsunami killing 61 people, destroying and damaging over 500 homes and businesses and resulting in more than 75 million dollars in damage. The tsunamis stunted the economic development of the Hilo and forever altered the landscape and led to changes in land use and the types of structures that are built on the bayfront.

As sugar cultivation declined throughout the end of the century, so did the economic growth and development of Hilo and it has stayed relatively the same in relation to the other major cities of the islands. This decline led to a more tourist-oriented economy focused on ecotourism, recreation, and the natural environment. Due to this, Hilo is not overly developed and still retains its historic character and scenic views. Some of the most popular attractions around Hilo today include Volcanoes National Park, the Mauna Kea Visitor Center and Summit, ‘Akaka Fall State Park, and Rainbow Falls.

Land Tenure and Development of the Project Area

No moʻoleo or any other historical information was found regarding traditional use of the project area. No archaeological evidence has been found, and is likely that any traditional sites present were displaced or destroyed during construction of the 4 Mile Creek Bridge and the Waiākea Homesteads.

The lands of Hilo including the ahupuaʻa of Waiākea and the project area were controlled by the aliʻi nui of Hawaii Island Kalaniʻopuʻu, in the 1700s. Upon his death in 1782 his lands were briefly passed to his son Kīwalaʻō who was killed at the Battle of Mokuʻōhai and overthrown by Kamehameha. After the death of Kīwalaʻō the lands of Hawaiʻi Island were divided into three parts with his uncle Keawemaʻuhili barely escaping and taking control of the Hilo portion. Later, in 1790, Keawemaʻuhili took control of the lands after killing Keōua Kūʻahuʻula for providing aid to Kamehameha. In the summer of 1791 Keōua was killed and sacrificed at the newly built war heiau, Puʻukohola, by Kamehameha I, making him the sole ruler of Hawaiʻi Island. The lands of Waiākea were controlled by the Kamehameha line up until the Māhele when they became Crown Lands owned by Kamehameha III (Kelly et al. 1981).

In 1861, S. Kipi was given a 5-year lease to the lands of Waiākea by Kamehameha IV for use as pastureland at a cost of $600 per annum. In 1874, under General Lease 124-A, Rufus. A. Lyman was given a 25-year lease to the lands of Waiākea. The Waiakea Sugar Company acquired the lease in 1879 and negotiated a new 30-year lease for the lands of Waiākea in 1888 with the lease term starting on June 1, 1888, and ending on June 1, 1918. It included 96,988 acres to be leased at a price of $2000 dollars per annum (Kelly et al., 1981:67).

The road alignment and bridge that comprise the project area roughly follow the path of a traditional Hawaiian trail that would become the Volcano Road. Throughout much of the 1800s it was a horse trail and the main thoroughfare for foreigners visiting Kīlauea Volcano. The Volcano Road is shown on historic maps of Hawaiʻi Island as early as the 1860s when interest in visiting the volcano began to grow. An 1886 map of Hawaiʻi Island shows the alignment of the Volcano Road to the east of the project area and the Waiakea Sugar Mill to the north (Figure 8).

Construction of the 30-mile-long Volcano Road from Hilo to Kīlauea began in 1891 at a cost of $90,000 dollars. An 1891 map of the Volcano Road shows the project area on the edge of an aʻā flow with the old Volcano Road alignment and a bridge pre-dating the 4 Mile Creek Bridge (Figure 9). The Volcano Road, now developed as a carriage road, was completed in 1894 and shortened the travel time to the volcano from 2 days to just 6 and a half hours (Castro 1953). Lastly, a 1902 map of Hawaiʻi Island shows the Volcano Road and the beginnings of homesteads, which later came to dominate the area (Figure 10).

The 4 Mile Creek Bridge was constructed in 1921 just east of the earlier Volcano Road alignment and consists of a concrete tee beam slab bridge measuring approximately 50 feet long and 20 feet wide with solid concrete panel parapets with caps, a reinforced concrete pier wall, and reinforced concrete abutments on each side (WSP USA 2024). The bridge is named after its location, a creek at the 4-mile marker along the Volcano Road. The bridge and new alignment of the Volcano Road are shown on a 1918 map of the Waiakea Homesteads which includes a portion of the project area (Figure 11).

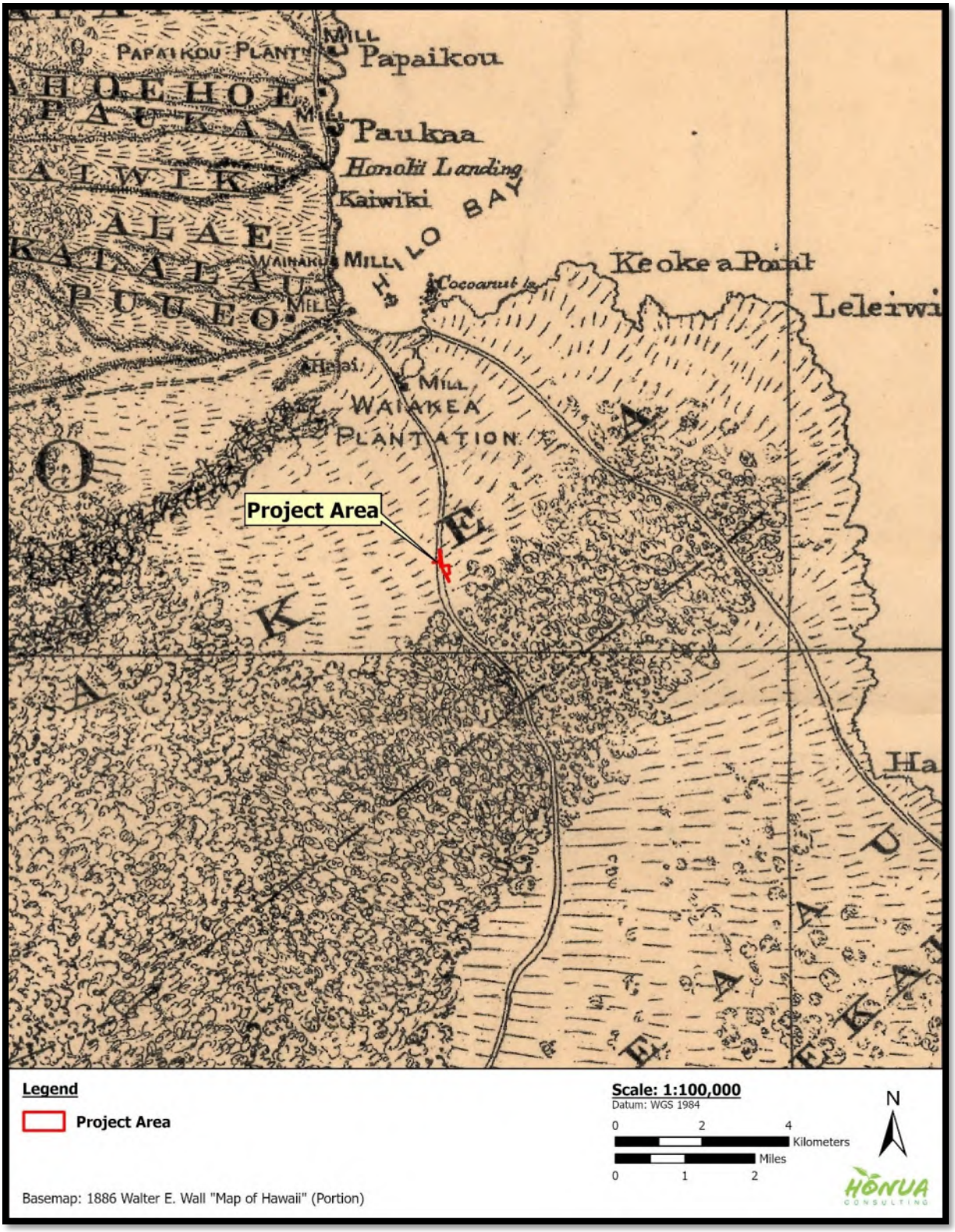

Figure 8. An 1886 map of Hawai‘i Island showing the project location in relation to the Volcano Road and the Waiakea Plantation (Wall 1886)

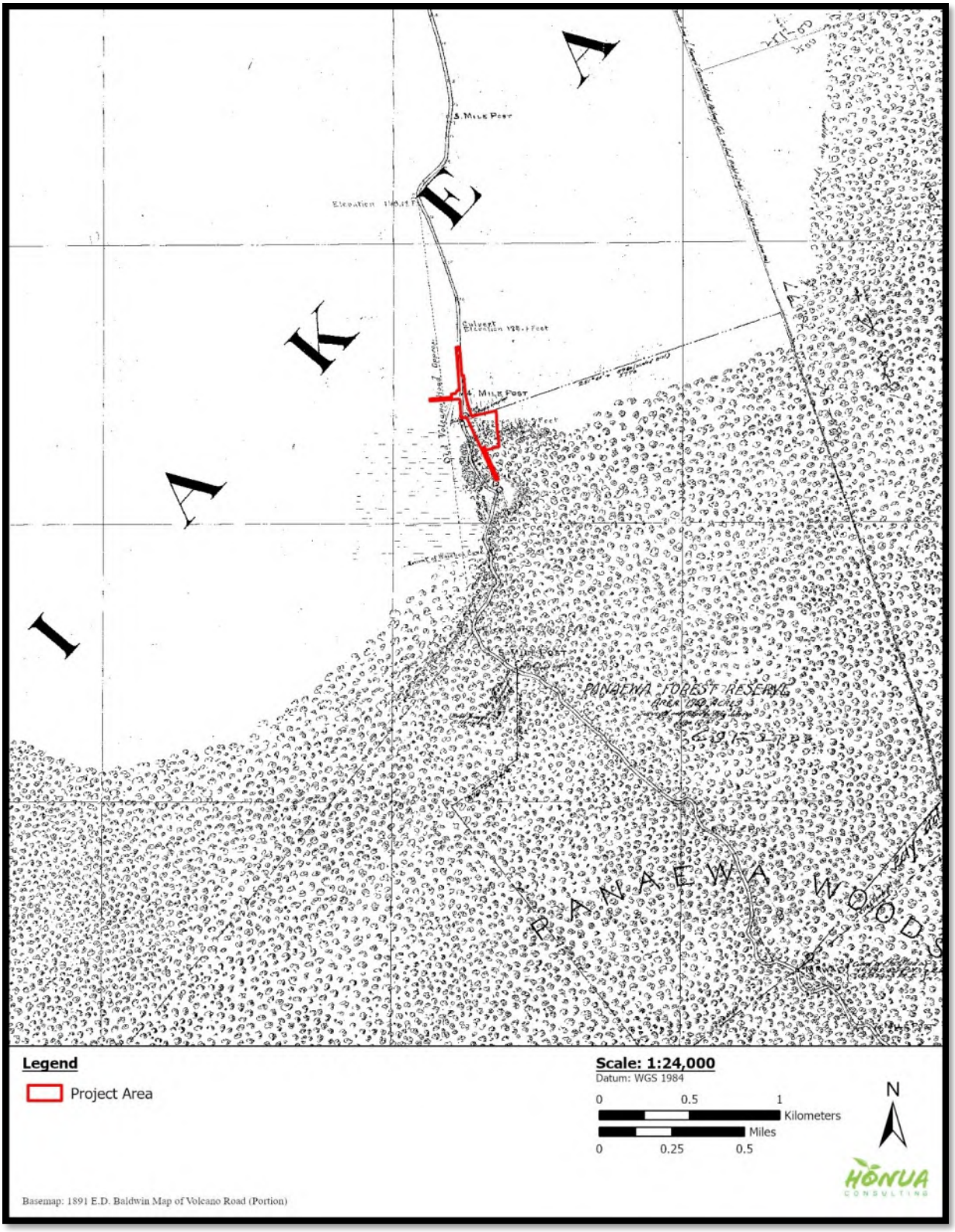

Figure 9. An 1891 map of the Volcano Road showing the project area at the edge of an a‘ā flow with the former Volcano Road alignment and bridge crossing to the west (Baldwin 1891)

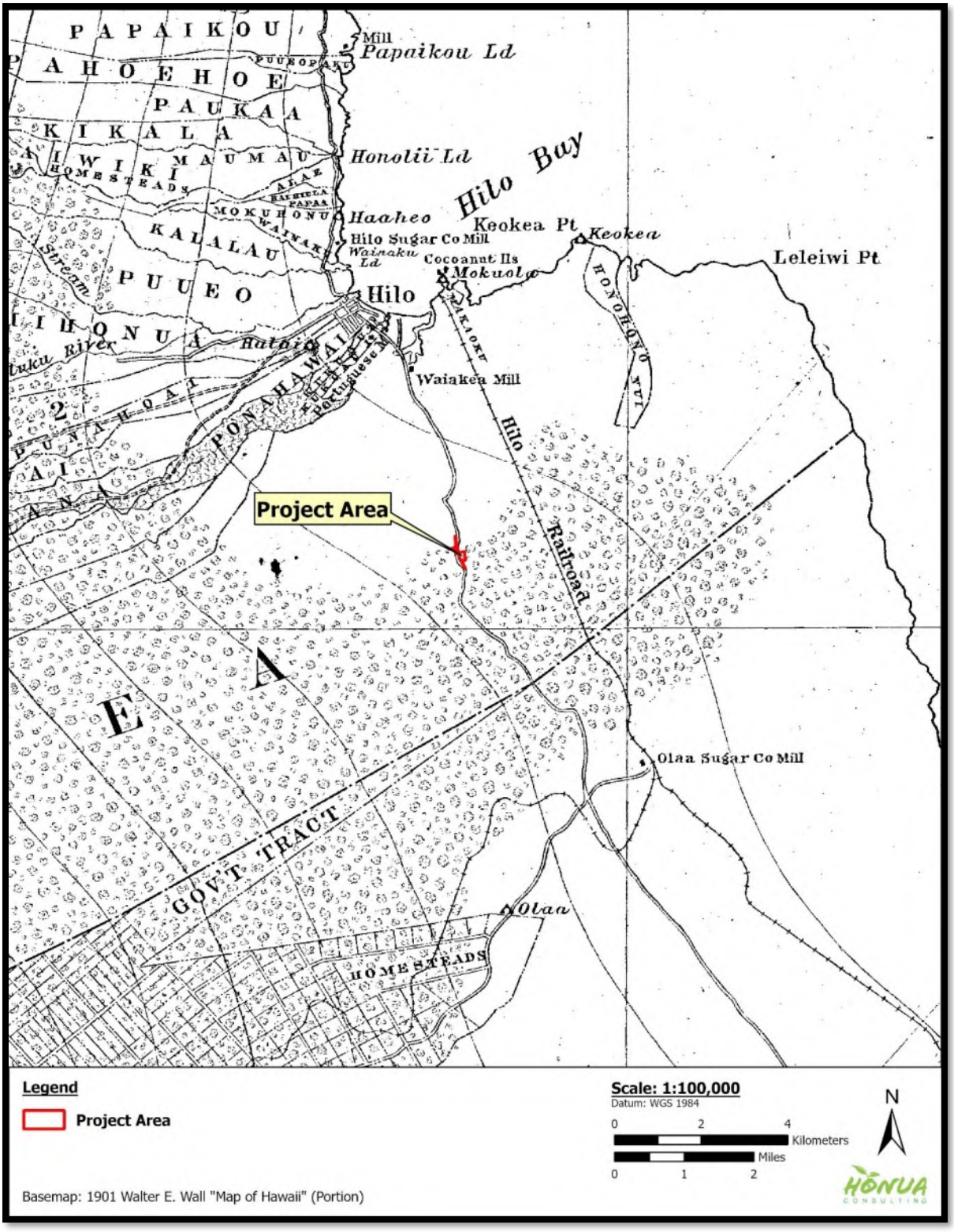

Figure 10. A 1901 map of Hawaii Island showing the project area with the Olaa Sugar Mill and homesteads to the south

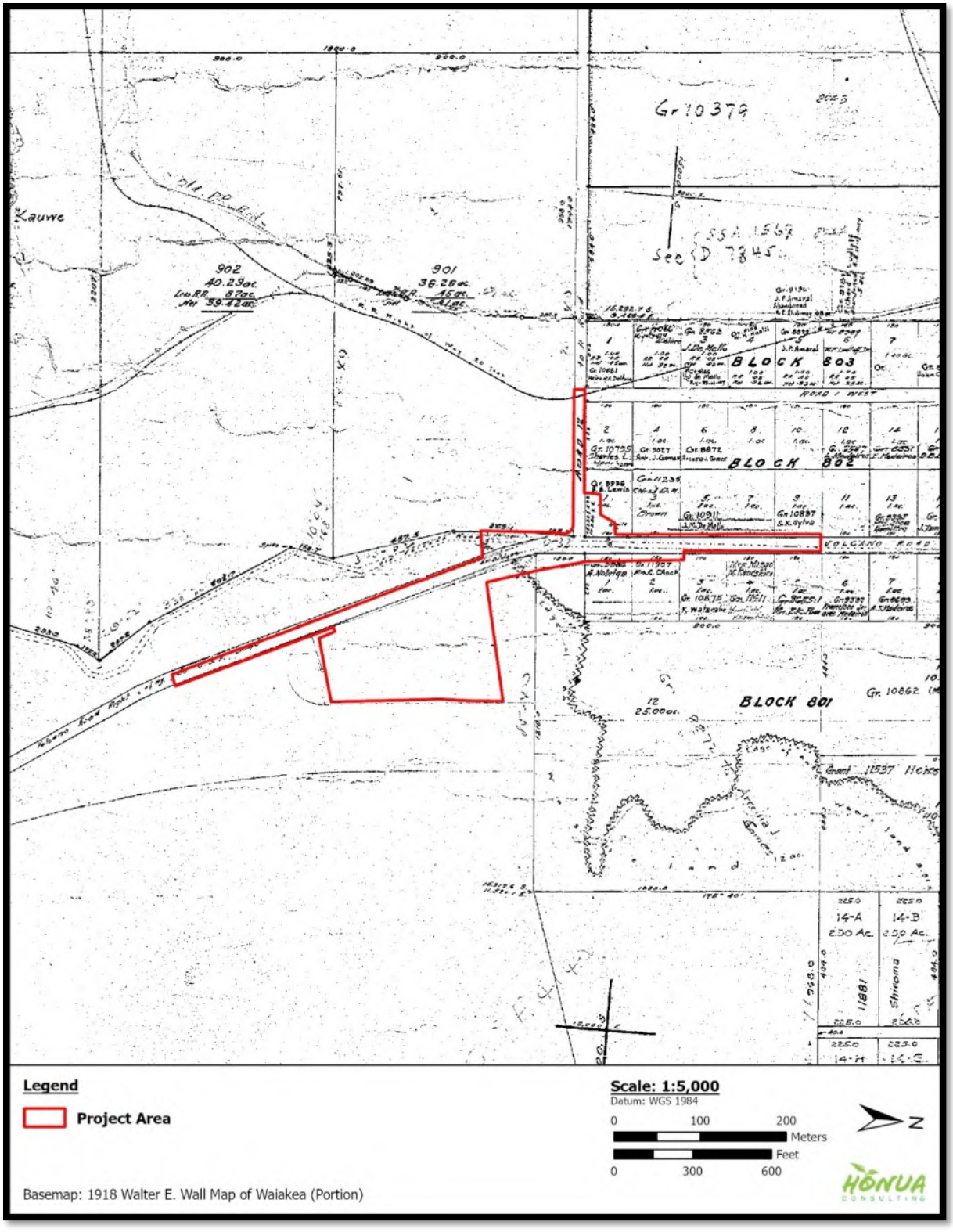

Figure 11. A 1918 map of the Waiakea Homesteads showing the newly constructed 4 Mile Bridge and new alignment of the Volcano Road (Cook and Arioli 1918)

The Waiakea Sugar Company lease to the lands of Waiākea ended on June 1, 1918, and was not renewed. Instead, the lands were divided by the territory into approximately 450 lots with half going to Waiakea Sugar Company and half going to the homesteaders as Land Grants for creation of the Waiakea Homesteads. A small portion of four homestead lots are within the project area and include Land Grant 8936 to B.B. Lewis, Land Grant 9986 to A. Nobriga, Land Grant 10875 to K. Watanabe, and Land Grant 11907 to Mrs. R. Chock, all of which measured 1-acre (see Figure 11). A listing of Land Grants awarded in the project area is shown in Table 2. At this time the name of the portion of the Volcano Road within the Waiakea Homesteads was changed to Kīlauea Avenue. The construction of the 4 Mile Creek Bridge in 1921 coincided with the opening of the Waiakea Homesteads that same year.

Table 2. Listing of Land Grants awarded in the project area

Land Grant	Claimant	Lot No.	Acreage
8936	B.B. Lewis		1 acre
9986	A. Nobriga		1 acre
10875	K. Watanabe		1 acre
11907	Mrs. R. Chock		1 acre

The Waiakea Sugar Company closed in 1937, and the area remained relatively the same through the 1940s (Figure 12). In 1955, Route 11 of the Hawaii Belt Road from Hilo to Kailua-Kona was constructed around the south side of the island and became the main route of transportation from Hilo to Volcanoes National Park. Construction of the new road rendered the portion of the Volcano Road containing the project area obsolete and it became a bypass road after that. A 1954 aerial photograph shows newly constructed Route 11 to the east of the project area (Figure 13). In the late 1950s and early 1960s the residential homestead area expanded to the east side of Route 11 as shown in a 1965 aerial photograph (Figure 14). The map also shows development of the 7.85-acre Panaewa Farm Lots which comprise the laydown and storage portion of the project area. The only known change to the 4 Mile Creek Bridge was in 1964 and consisted of altering the deck with tee beams, which has not diminished its integrity. Other than that, the project area and surroundings have stayed relatively the same since that time and this section of the Volcano Road, now Kilauea Avenue, continues to be an important and well-known bypass road for the Route 11.

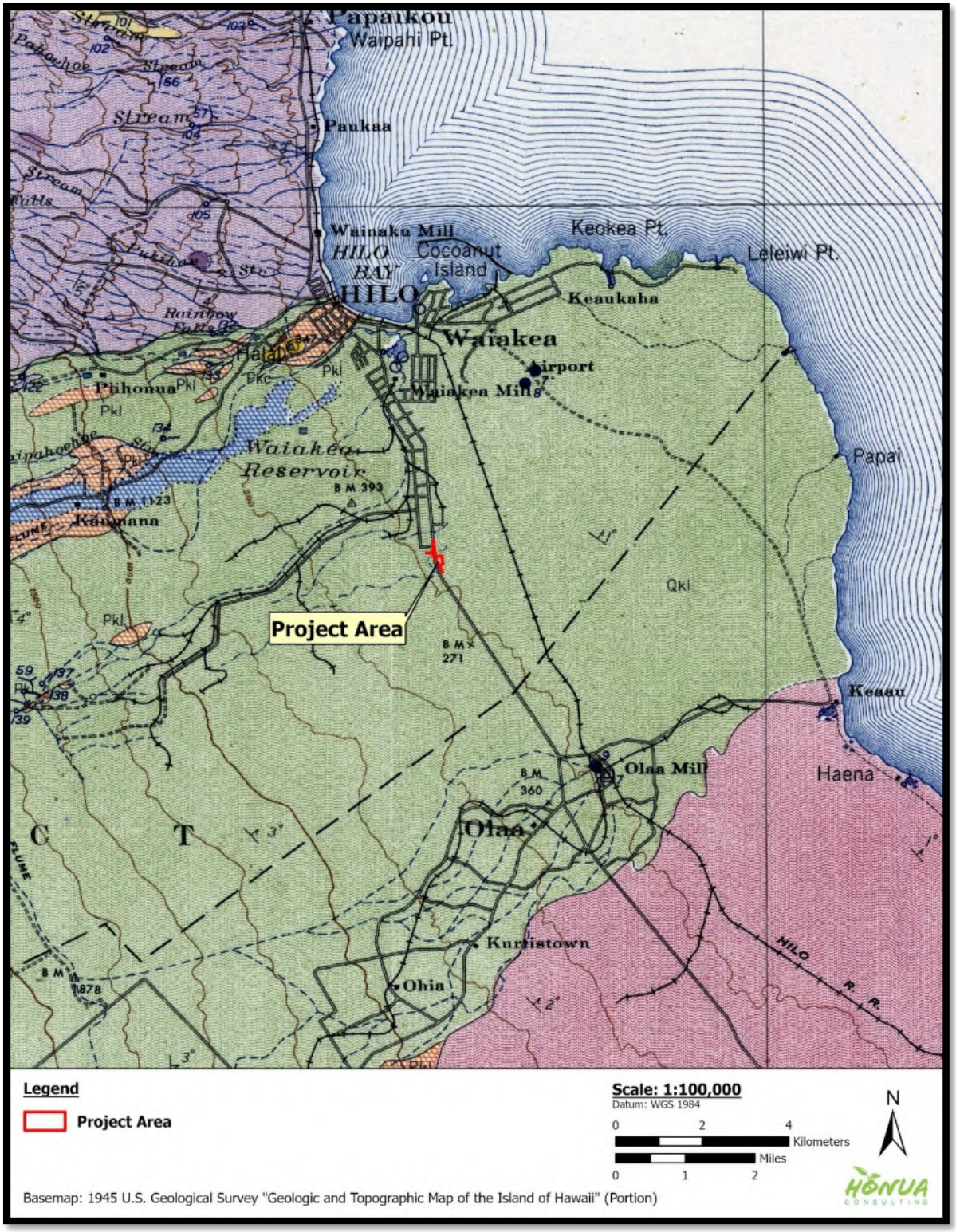

Figure 12. Portion of a 1945 U.S. Geological Survey (USGS) topographic map showing the project area location (red)

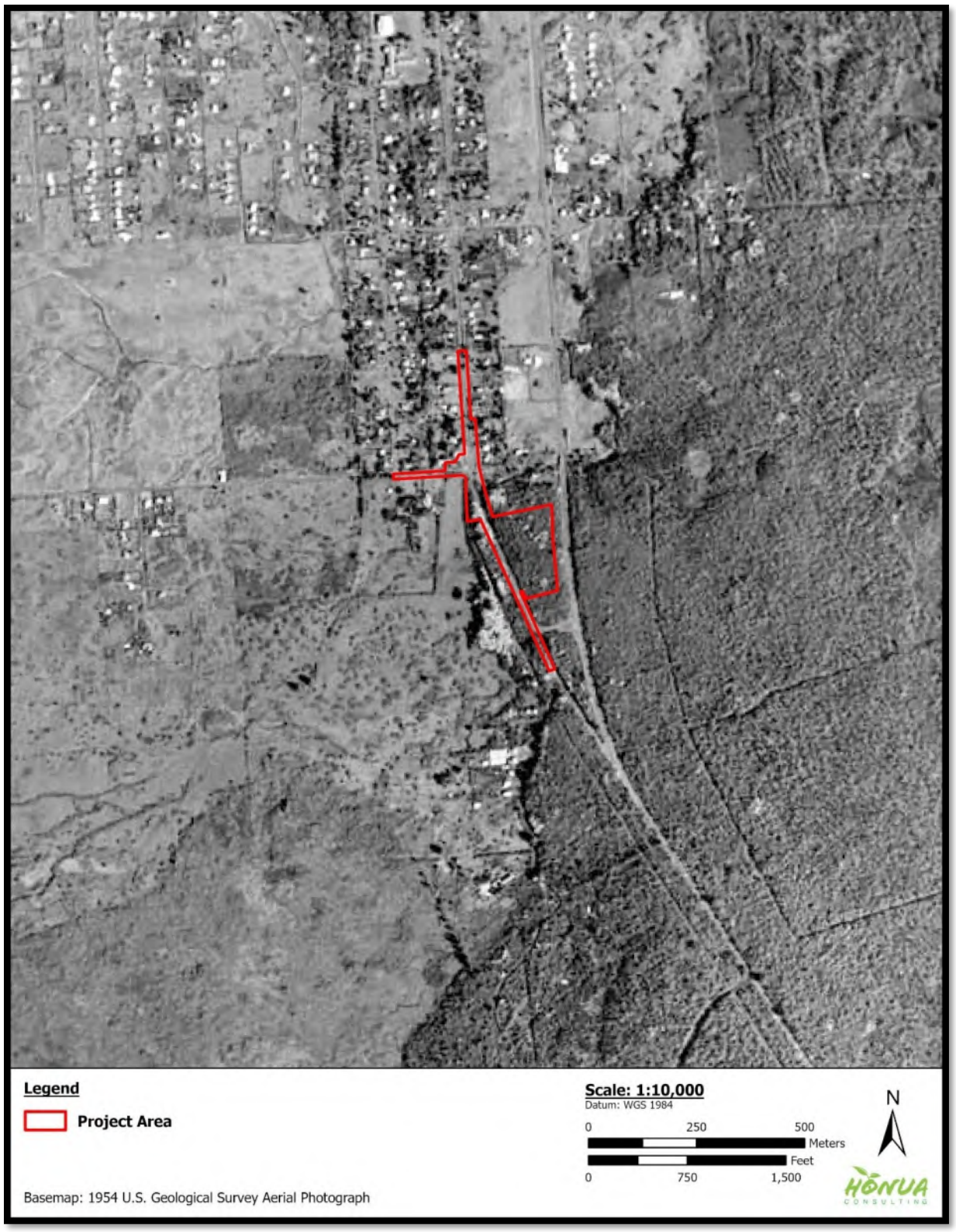

Figure 13. Portion of a 1954 USGS aerial photograph showing the project area (red) (USGS 1954)

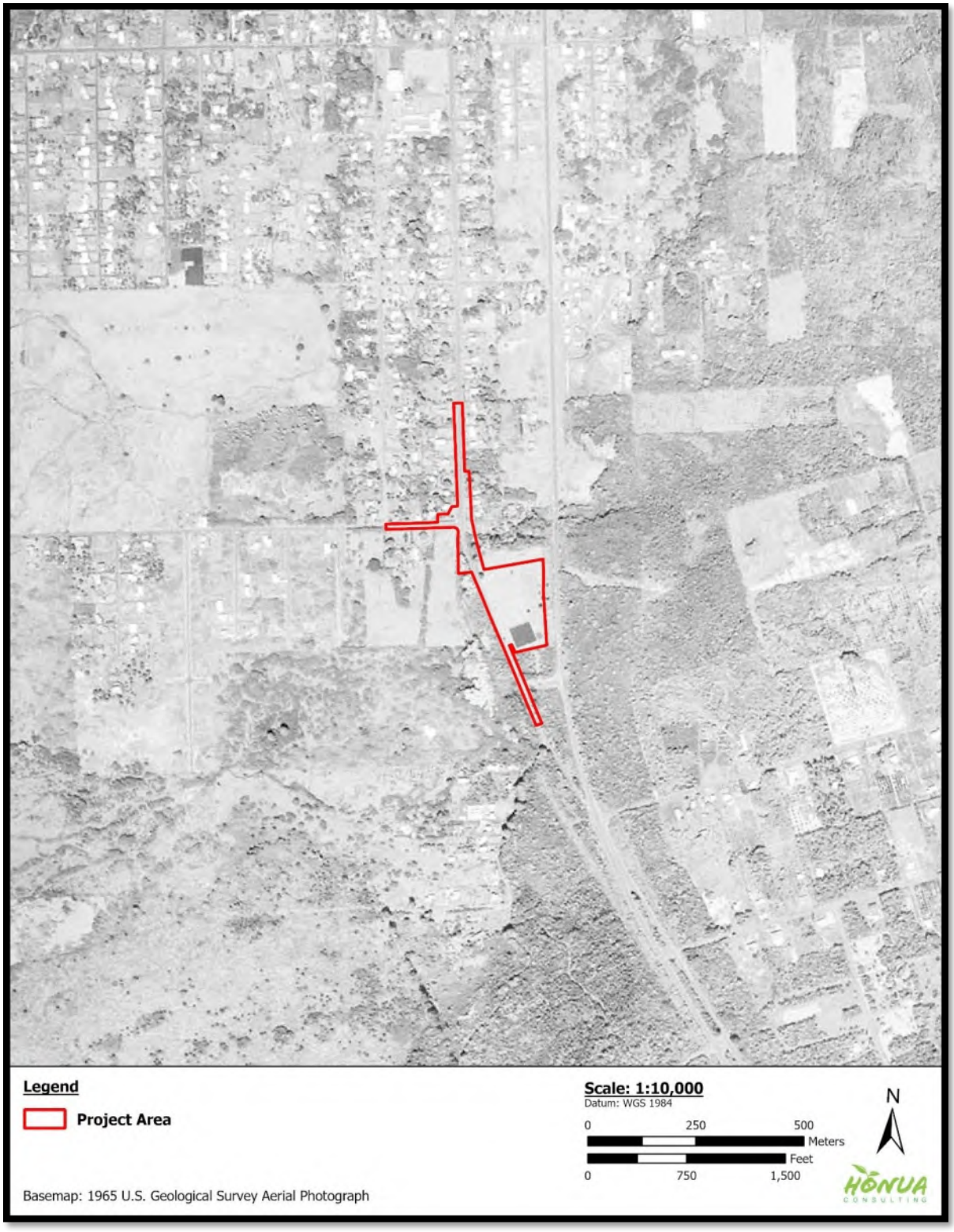

Figure 14. Portion of a 1965 USGS aerial photograph showing the project area (red) (USGS 1965)

Previous Archaeology

No archaeological studies have been conducted that included the project area and only a few have been conducted in the vicinity. This is due much of the surrounding area being developed for sugarcane cultivation and homesteads before historic preservation practices became commonplace and also due to an overall lack of modern development The types of sites that have been documented in the vicinity all date to the historic period and include plantation era features consisting of including walls, platforms, clearing mounds and other field system infrastructure. The closest sites to the project area include SIHP # 50-10-35-18886, an extensive field system located along the road to the south and interpreted as constructed during the historic era, and the Branco House, SIHP #50-10-35-7434, to the west. No traditional Hawaiian sites have been documented in the vicinity. This is likely due to modifications made to the area in the late 19th and early 20th century for commercial and residential development and the modification and reuse of traditional structures in historic times resulting indeterminate or historic age determinations for many of the structures, mounds, platforms, and walls documented in the area. Previous archaeological studies and historic properties in the vicinity of the project area are shown Figure 15 with detailed information on archaeological studies listed in Table 3.

Although not an archaeological study, it should be noted that the 4 Mile Creek Bridge was part of the most recent state bridge inventory in 2024 (WSP USA 2024). The 4 Mile Creek Bridge, State Bridge Number 001019201400400, was assessed for significance as eligible for listing on the National Register of Historic Places (NRHP) under Criterion c as a good example of a 1920s reinforced concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

Nearby Archaeological Studies

Hunt 1992

In 1992, Okahara and Associates, Inc. conducted an archaeological inventory survey for the Pūʻāinakō Street Expansion Project (Hunt 1992). The study documented a total of 31 features associated with historic-period sugar cane cultivation. At the time, the sites were inventoried and no SIHP numbers were assigned until later during Hunt and McDermott (1994) archaeological inventory survey.

Borthwick et al. 1993

In 1993, Cultural Surveys Hawaiʻi (CSH) conducted an archaeological inventory survey and testing at the research and technology lots of the University of Hawaii at Hilo (Borthwick et al. 1993). The study documented four historic properties: a historic-period agricultural field complex recorded as SIHP # -18667, a 20th century camp structure recorded as SIHP #-18668, a 20th century enclosure/wall recorded as SIHP # -18669, and a 20th century agricultural field recorded as SIHP # -18670.

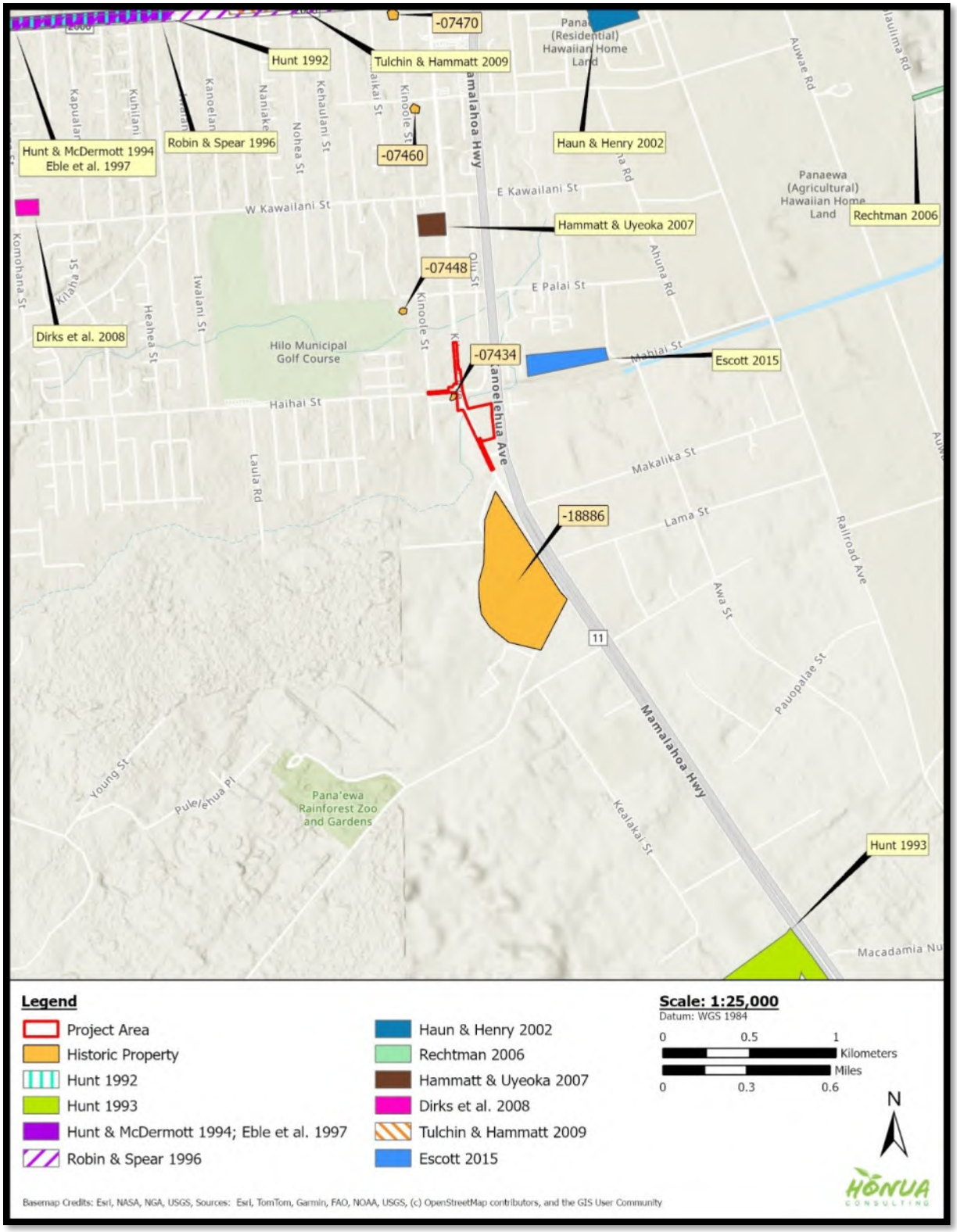

Figure 15. Esri imagery showing previous archaeological studies in the vicinity of the project area

Table 3. Table listing previous archaeological studies in the vicinity of the project area

Author(s)	Type of Study	Location	Findings (SIHP #50-10-35)
Hunt 1992	Archaeological Reconnaissance	Pūʻāinakō Street Realignment/Extension Project	Described thirty-one (31) features associated with historic-period sugar cane cultivation (later these features were formally assessed by Hunt and McDermott 1994
Borthwick et al. 1993	Archaeological Inventory Survey	University of Hawaiʻi at Hilo	Documented four (4) historic properties: a historic-period agricultural field complex recorded as SIHP # -18667, a 20th century camp structure recorded as SIHP #-18668, a 20th century enclosure/wall recorded as SIHP # -18669 and a 20th century agricultural field recorded as SIHP # -18670
Hunt 1993	Archaeological Reconnaissance Survey	Shipman Lands in Keaʻau (600 acres); TMKs: (3) 1-6-003:003, 007, 008, 011, 012, 027, 029, 058, 073, 075, 084, 086, & 090	Identified fifty (50) archaeological features including walls, platforms, and mounds. Features were found in areas less impacted by cane cultivation, likely associated with historic plantation activities; no SIHP #s were designated
Hunt and McDermott 1994	Archaeological Inventory Survey	Pūʻāinakō Street Realignment/Extension Project	Recorded a total of eleven (11) sites comprised of 97 feature components within the proposed road alignment, interpreted as associated with historic commercial sugar cane cultivation
Robins and Spear 1996	Archaeological Inventory Survey	Pūʻāinakō Street Realignment/Extension Project, Expanded Corridor	Recorded two (2) additional plantation era sites with multiple feature components, interpreted as associated with historic commercial sugar cane cultivation
Eble et al. 1997	Supplemental Testing Report	Pūʻāinakō Street Realignment/Extension Project, Alternate Alignments	Conducted archaeological testing of SIHP #s -18911, -18912, -18914, -18915, -18916 and -18917, excavation showed all subsurface evidence of pre-Contact Hawaiian use of the land had been destroyed by commercial agriculture
Haun and Henry 2002	Archaeological Inventory Survey	28-acre DHHL project at Panaʻewa, TMK: (3) 2-2-047:001	No historic properties recorded

Author(s)	Type of Study	Location	Findings (SIHP #50-10-35)
Rechtman 2006	Archaeological Letter Report	Yamada and Sons Roadway and Quarry, TMKs: (3) 2-1-013:002 por. & 148 por.	No historic properties recorded
Hammatt and Uyeoka 2007	Archaeological Monitoring Report	DOE Cesspool Project, Waiākeawaena Elementary School, TMK: (3) 2-2-042:017	No historic properties recorded
Dircks Ah Sam et al. 2008	Archaeological Inventory Survey	Two Waiākea Homestead Parcels; TMKs (3) 2-4-12:016 & 017	Recorded four (4) plantation era sites: a rock clearing mound associated with sugarcane cultivation recorded as SIHP # -26470, a partial enclosure interpreted as the remains of a 1950s-era workshop structure recorded as SIHP # -26471, and two rock walls with core-filling recorded as SIHP #s -26472 and -26473
Escott 2015	Archaeological Inventory Survey (Archaeological Assessment)	Pana‘ewa Homesteads, Five 10-acre DHHL Parcels; TMKs: (3) 2-1-025: 006, 007, 047, 048 & (3) 2-1-061: 002	No historic properties recorded

Hunt 1993

In 1993, Terry Hunt performed an archaeological survey of approximately 600 acres of Kea‘au lands owned by the Shipman Company (Hunt 1993). The survey concluded that most of the 600-acre area was heavily impacted by sugarcane cultivation with the exception of five, less impacted areas, containing a total of 50 features, including mounds, platforms, walls, and multi-feature site complexes. The features were interpreted by Hunt (1993:11–12) as likely “associated with historic plantation activities, such as field clearing, and other cultivation work. It is possible that some features may date to earlier, prehistoric times, but further research, including test excavations would be needed to evaluate such a hypothesis.” The study recommended an archaeological inventory survey prior to any future development in those specific, feature-laden areas.

Hunt and McDermott 1994

In 1993, Terry Hunt and Matthew McDermott conducted an AIS of the proposed Pū‘āinakō Street extension (Hunt and McDermott 1994). The survey recorded a total of 11 sites comprised of 97 feature components within the proposed road alignment. All of the sites dated to the historic period and were interpreted as associated with the Waiākea Sugar Plantation. They included numerous stacked mounds, curvilinear walls, platforms, terraces, enclosures, and modified outcrops. Historical background research and interviews with local residents indicated the features were historic and related commercial sugar cane cultivation in the area sometime after the 1870s.

Robins and Spear 1996

In 1996, Scientific Consulting Services, Inc. (SCS) conducted an archaeological inventory survey of an expanded corridor for the Pūʻāinakō Street Realignment/Extension Project which extended into Kukuʻau 1 and 2 and Ponahawai ahupuaʻa (Robins and Spear 1996). The study documented two additional plantation era sites with numerous feature components and also interpreted as associated with the Waiakea Sugar Company.

Eble et al. 1997

In 1997, supplemental archaeological testing was conducted at several previously documented sites along proposed alternate alignments of Pūʻāinakō Street (Eble et al. 1997). Subsurface testing was conducted at several sites that included SIHP #s -18911, -18912, -18914, -18915, -18916 and -18917. The results of the subsurface testing indicated that evidence of pre-Contact Hawaiian use of the land had been destroyed by commercial agricultural activities.

Haun and Henry 2002

In 2002, Haun and Associates conducted an archaeological inventory survey of a 28-acre parcel of DHHL land at Panaʻewa (Haun and Henry 2002). The survey consisted of a pedestrian survey of the parcel that documented no historic properties. The lack of historic properties was attributed to extensive land modifications made to the area for urban development.

Rechtman 2006

In 2006, Rechtman Consulting conducted a field inspection and produced a brief archaeological letter report for the Yamada and Sons roadway and quarry site (Rechtman 2006). No historic properties were documented during the field inspection.

Hammatt and Uyeoka 2007

In 2007, CSH conducted archaeological monitoring for septic system upgrades at the Waiākeawaena Elementary School as part of the Department of Education Cesspool Project (Hammatt and Uyeoka 2007). No historic properties were documented during archaeological monitoring.

Dircks Ah Sam et al. 2008

In 2008, Rechtman Consulting conducted an archaeological inventory survey for two Waiākea Homestead parcels totaling 4 acres and located in former Lot 617B (Dircks Ah Sam et al. 2008). The survey recorded four historic plantation era sites and included a rock clearing mound associated with sugarcane cultivation recorded as SIHP # -26470, a partial enclosure interpreted as the remains of a 1950s-era workshop structure recorded as SIHP # -26471, and two rock walls with core-filling recorded as SIHP #s -26472 and -26473.

Escott 2015

In 2015, SCS conducted an archaeological inventory survey for five 10-acre Department of Hawaiian Homelands parcels in the Panaʻewa area (Escott 2015). No sites were identified during the pedestrian survey of the property it was termed an archaeological assessment. The lack of historic properties was due to historic era modifications to the area including grading and the construction of three roadways.

Field Results

Fieldwork for this project was conducted on August 3, 2023, and August 29, 2024, by Honua Consulting archaeologists Frederick LaChance IV, B.A. and Nathan J. DiVito, M.A., who also served as the principal investigator. The fieldwork required approximately 2 person-hours to complete. The site investigation was performed under the archaeological permit numbers 23-23 and 24-26 issued to Honua Consulting by the SHPD/DLNR in accordance with HAR Chapter 13-282.

Methodology

The archaeological field inspection consisted of a 100% pedestrian survey of the traversable portions of the project area. It included a visual inspection for any constructed surface architecture and observation of the ground surface and soil exposures for artifacts and/or exposed cultural deposits. Digital photographs were taken throughout the project area to record the vegetation, topography, and condition of the project area as well as any previously documented and newly documented historic properties, historic buildings, and any other points of interest. An associated photo log was maintained, which recorded the subject of the photograph, the direction the camera was pointing, and other information as appropriate. Trimble® Terraflex™ software and an external R2 unit was used to geolocate photos and record transect paths and other points of interest on the property. The R2 GPS unit maintained an accuracy ranging between 1-2 m (3-6 ft.) and all recorded GIS data was later post-processed for sub-meter accuracy. GIS data and maps for this project were created by Frederick LaChance IV, B.A.

Field Inspection Results

The project area for the field inspection was located in south Hilo and included the 4 Mile Creek Bridge, portions of the asphalt Kīlauea Avenue right-of-way on either side of the bridge, a portion of Haihai Street, and a proposed laydown/storage area situated at the former Pana‘ewa Farm Lots. The field inspection consisted of pedestrian reconnaissance of the entirety of the project area.

The 4 Mile Creek Bridge was constructed in 1921, which coincide with completion of the Waiākea Homesteads. The bridge is named after its location, mile marker 4 of the Volcano Road. Although the bridge is overgrown, it was observed in good condition and consists of a concrete tee beam slab bridge measuring approximately 50 feet long and 20 feet wide with solid concrete panel parapets with caps, a reinforced concrete pier wall, and reinforced concrete abutments on each side (Figure 16 Figure 17). A surveyor’s datum dating to 1926 is present on the top of the southern side of the western concrete panel wall of the bridge and the date the bridge was constructed, 1921, is inscribed on the northern end of the wall (Figure 18 and Figure 19).

The roadways throughout the project area were asphalt paved. The shoulder was minimal and guardrails were present in areas along Kīlauea Avenue south of the bridge to Hale Manu Drive (Figure 20). In the Waiākea Homesteads the edges of developed and manicured house lots were present along the roadways and included Kīlauea Avenue north of the bridge and a portion of Haihai Street between Kilauea Avenue and Kino‘ole Street (Figure 21and Figure 22). No historic infrastructure of note was documented along either of the roadways.

The last area included in the field inspection measured approximately 8 acres in size and was for a proposed laydown/material storage area at the former location of the Panaewa Farm Lots. A metal entrance gate provides access to the parcel from Kīlauea Avenue (Figure 23). The property is overgrown from being abandoned but the structures and irrigation infrastructure present on the property indicate it has been used up until recently (Figure 24). The area was completely leveled and graded for farm lots as early as the 1960s which would have displaced or destroyed any archaeological sites present in the area. No historic infrastructure or artifacts of note were encountered during the inspection.

No historic properties were documented and no significant artifacts or features were encountered during the field inspection. The lack of historic properties is due to the project area being almost entirely almost entirely devloped and within existing road right-of-ways, the 4 Mile Creek Bridge crossing, and the former Pana‘ewa Farm Lots.

Figure 16. Overview photo of the eastern side of the 4 Mile Creek Bridge, looking south

Figure 17. Overview photo of the western side of the 4 Mile Creek Bridge, looking south

Figure 18. Close-up view of a 1926 U.S. Coast & Geodetic Survey Bench Mark located on the western wall of the bridge

Figure 19. Close up photo of a date inscription of 1921 on the western wall of the bridge, looking south

Figure 20. Overview photo of Kilauea Avenue south of the 4 Mile Bridge looking toward Hale Manu Drive

Figure 21. Overview photo of the portion of Kīlauea Avenue north of the bridge from 2650 Kilauea Avenue looking south

Figure 22. Overview photo the portion of Haihai Street within the project area from Kino‘ole Street, looking east

Figure 23. Overview photo showing overgrown vegetation at the proposed laydown/material storage area from the entrance gate at Kīlauea Avenue, looking northeast

Figure 24. Overview photo of a modern greenhouse within the proposed laydown/material storage area, looking west

Summary and Recommendations

This Archaeological Literature Review and Field Inspection (ALRFI) was completed by Honua Consulting at the request of Consor Engineers, LLC in support of the Four-Mile Creek Bridge Improvements Project located in Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island, TMKs: (3) 2-2-048:001 & 999 por.; (3) 2-4-045:999; 3-2-2-043:029, 030, 031, 032, 043, 102, 104, 105, 106, 125, 135, 136 & 999 por.; (3)-2-4-004:132 por. The property measures approximately 10.18 acres (443,372 square feet [sq ft] or 41,191 square meters [sq m]) in size and is owned by the State of Hawa i‘i. The project area is located in south Hilo partially within the Waiākea Homesteads and includes portions of Kīlauea Avenue and Haihai Street, the 4 Mile Creek Bridge, and the former Pana‘ewa Farm Lots. The goals of the Four-Mile Creek Bridge Improvements Project are to increase vehicle and pedestrian flow as well as hydraulic flow, to improve the intersection of Kīlauea and Haihai Street, and to increase the overall safety of the bridge crossing.

The road alignment and bridge that comprise the project area roughly follow the path of a traditional Hawaiian trail that would become the Volcano Road. Throughout much of the 1800s it was a horse trail and the main thoroughfare for foreigners visiting the Volcano House at Kīlauea Volcano. Construction of the 30-mile-long Volcano Road from Hilo to Kīlauea began in 1891 to the west of the project area and the carriage road was completed in 1894 and shortened the travel time to the volcano considerably. The 4 Mile Creek Bridge and the Waiākea Homesteads were completed in 1921 and the name of the road in this area was changed to Kīlauea Avenue. In 1955, Route 11 of the Hawaii Belt Road from Hilo to Kailua-Kona was constructed around the south side of the island and became the main route of transportation from Hilo to Volcanoes National Park. Construction of the new road rendered the portion of the Volcano Road containing the project area obsolete and it became a bypass road after that. The last known modifications to the bridge were completed in 1964 and included the addition of tee beams to the bridge deck that have not diminished its historic integrity.

Although no previous archaeological studies have been conducted that included the project area, the 4 Mile Bridge has been subject to an architectural evaluation as part of the State Bridge Inventories of 2014 and 2024 (WSP USA 2024). The 4 Mile Creek Bridge, State Bridge Number 001019201400400, was assessed for significance as eligible for listing on the National Register of Historic Places (NRHP) under Criterion c as a good example of a 1920s reinforced concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

The archaeological studies that have been conducted in the surrounding area are sparse due to development of the area prior to historic preservation becoming commonplace and they had negative results or documented plantation era infrastructure associated with the former Waiakea Sugar Plantation.

The archaeological field inspection consisted of a 100% pedestrian survey of the traversable portions of the project area. The project area was completely developed, and no historic properties were documented, and no significant artifacts or features were encountered during the field inspection. The lack of historic properties is due to the project area being almost entirely developed and within existing road right-of-ways, the 4 Mile Creek Bridge crossing, and the former Pana‘ewa Farm Lots.

Although, this study is not an Archaeological Inventory Survey (AIS), it has been conducted according to standards outlined in Hawai‘i Administrative Rules (HAR) §13-276 for AIS studies and is intended to assist with the project’s compliance with Hawai‘i Revised Statutes (HRS) 6E-8 and HAR §13-275 in consultation with the State Historic Preservation Division (SHPD). Fieldwork was performed under archaeological permit number 23-23 and 24-26 issued to Honua Consulting by the SHPD in accordance with Hawai‘i Administrative Rules (HAR) Chapter 13-282.

Since no plans have been finalized for the 4 Mile Creek Bridge Improvements Project, recommendations include consultation with SHPD and an evaluation of historic buildings by a qualified architectural historian prior to development.

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APPENDIX D
Pre-Consultation Comments and Responses

APPENDIX E
Community Meeting Minutes July 6, 2023

Community Meeting: Four Mile Creek Bridge 7/6/2023

Meeting Minutes

Waiakeawaena Elementary School – 5:30 to 7:30 pm

Attendance:

DPW:
Stephen Pause
Keone Thompson
Sherise Kanae-Kane
Kason Pacheco
Melanie DeMello

Consor Engineers:
Ikaika Kincaid
Adam Miller
Koby Kosaki
Timothy Parish

Fifteen community members attended, sign-in sheet redacted for privacy.

Opening Remarks – Sherise Kanae-Kane & Stephen Pause DPW Director

The bridge is planned to be widened from 20' wide to approximately three times its current width (62') to accommodate multiple lanes of traffic over the bridge.

Currently at 15% Conceptual Design

Project Presentation – Ikaika Kincaid & Keone Thompson

Currently a one lane bridge with alternating traffic in both directions, south and north traffic.

The proposed bridge will have:

- Sidewalks on both sides.
- Bike lanes on both sides.
- 3 lanes; one each north and south and a left turn lane on to Haihai st.
    - 11’ wide drive lanes, looking at approximately 60’ out-to-out width which is 3 times increase from the existing 20’ out-to-out width.
- A stoplight will have to be added at Haihai intersection north of the bridge.


7'-6"
8'-0"
11'-0"
11'-0"
11'-0"
8'-0"
7'-6"

Roundabout (option was ruled out)

- Radius requirement is too large due to speed roadways, and
- Due to retaining wall constraint the road would need to be pushed out resulting in significant ROW issues with the surrounding houses north of the bridge along Kilauea.

History:

- Bridge was constructed in 1920 and rebuilt in the 1960s
  - Considered historic/high preservation.
  - The railings are considered historic, so railings will be built to match original "style"
    - Will also be crash tested and sized up for the bridge.

Timeline & Next Steps – Stephen Pause

- Schedule as of today (15% design)
  - 2 years to complete design and permitting (2025 July)
  - Procurement will take approx. 3 to 6 months
  - Bid will be around September to October 2025
  - Construction estimated 18 months (Completion in 2027)
- Money:

- Based on level of design today, cost estimate $14.5 million
- Currently acquired $12 million from Richard Onishi (house of representatives – District 2)

- Next steps:
  - Permitting and Design
  - Traffic control plan development – sensitive to community and neighborhood during the actual construction to mitigate the effect it will have on local traffic. Bridge will remain open during construction. ½ of the bridge built first, then shift traffic over and then construct the other side.
  - Several more community meetings to come regarding the bridge.

Questions & Answers:

Key:

Q (Question)
A (Answer)
Comment (Community Comment)
Suggestion (Community Suggestion)
Action Items (For Engineering Planning)

1. Q: Fire department input? Will trucks be able to make turn out because areas not currently accessible to emergency vehicles?
   a. A: The turning radiuses and new street design should allow emergency vehicles to access the roads.
2. Q: Regarding the fire trucks coming down Haihai to turn onto Kilauea, is the turn radius at Haihai going to be resolved to ensure that they will now be able to access Kilauea? **(Richard Onishi)**
   a. A: More work will need to be done to analyze if adequate space will be created to allow space for emergency vehicles
   b. A: There are constraints to neighboring areas (power lines, retaining walls, etc.)
   c. A: Will go to local fire department to get input for design of turn
   d. A: The scope is a bit outside of the bridge but may look into it when improving intersection
3. Q: Is the 14.5 million an estimate for the intersection only, or is it also an estimate for the costs of the alternatives such as the roundabout?
   a. A: It is an estimate for the traffic light, NOT the roundabout (no estimation is done for that alternative as of now)

4. Suggestion: Property at intersection with Haihai street may be abandoned and for sale, may be able to consider widening of Haihai if it is purchased for construction of roundabout. (Richard Onishi)
5. Q: Left turn onto Kilauea leads to massive traffic in the area near Waiakeawaena; people cut off at Kinoole turning onto Haihai
    a. A: Not in scope of the bridge (up Haihai)
    b. A: Can look at estimated cost if purchasing the Haihai property, BUT the widening may require both sides of road rather than the one side of property for the roundabout.
6. Q: Will construction of the bridge take 2 years?
    a. A: 2 years to do environmental assessment and permits for the area
    b. A: Stream channel; requires special permitting before construction
    c. Q: A lot of older people in Hale Manu; afraid of the effect construction will have on access to Kilauea; do not want to turn onto main highway to leave neighborhood.
        i. A: Half of bridge will be demolished, and half will remain open for traffic flow during construction to ensure access will continue throughout construction
7. Q: Design of bridge includes sidewalks; is that required by law? **(Richard Onishi)**
    a. A: No, it is something that is optionally added to improve access
    b. A: New grant awarded to connect Puainako to Haihai using sidewalk (Federal multi-year grant)
        i. A: Will help improve connectivity
    c. Q: There are NO people in the area, beyond that is the highway; is the sidewalk necessary? **(Richard Onishi)**
        i. A: There have been input from people that say that they do use the bridge for bicycle and pedestrian walkways
        ii. Q: Is the sidewalk necessary on BOTH sides? Beyond the farm there is no shoulder for pedestrians so there is no purpose to having the extra cost on both sides. **(Richard Onishi)**
            1. A: Will look at the alternative for developing one side sidewalk, BUT it is something that is being tried to incorporate to every new project
            2. A: There is a lot of pressure from competing interests of vehicle movement and pedestrian/bicycle safety; if a roundabout is implemented intense implementation of speed tables and safety systems will be required

3. **Suggestion: One side of sidewalk may serve the same purpose while reducing the cost greatly (7.5 feet of cost throughout bridge, significant savings). (Richard Onishi)**

8. Q: What is the expected lifespan of the bridge?
    a. A: 75 years
    b. Comment: If 75 years is the anticipated lifespan; projecting into future with potential reduction of fossil fuels may lead credence to the pedestrian/bicycle accessibility **(Laura Acasio)**
    c. Comment: BUT the bridge is surrounded by state land, no reason for most pedestrian access which may make the sidewalk redundant. **(Richard Onishi)**
9. Q: Who owns the area past bridge near the highway?
    a. A: Everything Is state-owned past the intersection besides a small sliver owned by the temple.
    b. A: Powerlines along the side of the road opposite of the main highway; therefore, the side of the road with the powerline is being held to accommodate the powerlines and utility poles
    c. Q: Can the bridge be aligned to become straight with existing Kilauea road?
        i. A: No, because stream turns past Haihai which prevents construction of a straight run for the bridge and road past Haihai to Keeau
10. Q: What website can be used to reach out to Hawaii County?
    a. www.hawaiicounty.gov and click on Department of Public Works
11. Q: By KTA Kilauea and Kinoole (Baptist church). Can there be something done where if you come from Hilo town to KTA so that a left turn signalized plan be implemented.
    a. A: They are state roads.
    b. Suggestion: Take away wasted coned off section and create a left turn lane with signals
        i. A: Once a left turn is implemented, through traffic will be greatly delayed; requests for Federal funding to widen Puainako street to Highway 11 are being proposed.
12. Q: Is this funding secured for the bridge? Will not be taken away in the future (the 14.5 million) like the previous funding for the project was?
    a. A: Original funds were never released by the state; this funding has been released to the county—it is in writing from David Ige to secure the funding of $12 million from the state.
    b. A: Was not a matter of losing money previously, it was never delivered.
    c. A: YES

APPENDIX D
Pre-Consultation Comments and Responses

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Benjamin T. Moszkowicz
Police Chief

Reed K. Mahuna
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT

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August 20, 2025

TO : JACOB SAKAGUCHI, ENGINEERING DIVISION, DEPARTMENT OF PUBLIC WORKS

FROM : KENNETH A.K. QUIOCHO, ASSISTANT POLICE CHIEF, AREA I
OPERATIONS BUREAU

SUBJECT: PRE-CONSULTATION FOR A DRAFT ENVIRONMENTAL ASSESSMENT
FOUR MILE CREEK BRIDGE REPLACEMENT (#22-7) PROJECT
COUNTY JOB NO. E-4678, HILO, HAWAI'I ISLAND, HI
TAX MAP KEYS: KILAUEA AVE. RIGHT-OF-WAY; HAIHAI ST. RIGHT-OF-WAY (3) 2-2-048:001; (3)2-4-004:132; (3)2-2-043, PARCELS 30, 31, 32, 43, 102, 104, 105, 106

Staff, upon reviewing the provided documents, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact our South Hilo District Commander, Captain Aaron Carvalho, at (808) 961-2316 or via email at aaron.carvalho@hawaiipolice.gov.

AC:ws/25HQ0736

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Kenneth A. K. Quiocho, Assistant Police Chief, Area 1 Operations Bureau
349 Kapiolani Street
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106
Document Reference: 25HQ0736

Dear Mr. Quiocho,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated 08/20/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and notification that your department does not have concerns regarding project impacts at this time.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

Kenneth A.K. Quiocho
Assistant Police Chief, Area I Operations Bureau
County of Hawai'i, Police Department
October 27, 2025

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU

HAWAII DISTRICT
50 MAKAALA STREET
HILO, HAWAII 96720
TELEPHONE: (808) 933-8866 • FAX: (808) 933-8869

IN REPLY REFER TO:

HWY-H 25-2.148

August 25, 2025

Mr. Jacob Sakaguchi
County of Hawaii
Department of Public Works
Engineering Division
101 Pauahi Street, Suite 7
Hilo, Hawaii 96720-4224

Dear Mr. Sakaguchi:

Subject: Pre-Consultation for a Draft Environmental Assessment
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No E-4678
Tax Map Key: (3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043
Parcels 30, 31, 32, 43, 102, 104, 105, 106
Kilauea Avenue and Haihai Street
Waiakea, South Hilo, Hawaii

Thank you for your letter requesting a pre-consultation review and comment on the proposed project Draft Environmental Assessment. We have the following comment:

> The Federal Emergency Management Agency Flood Insurance Rate Map Panel 912 depicts the area of Special Flood Hazard Area Zone AE and is in an apparently different location from the previously submitted Plan Rendering. We are concerned that any redirection of the Four Mile Creek flow will impact the downstream Panaewa Bridge on Route 11, Kanoelehua Avenue.

Should you have any questions, please contact Clifford Corpuz, Hawaii District Construction Engineer, at (808) 933-8876 or by email at clifford.a.corpuz@hawaii.gov.

Sincerely,

amatsuda

ANNETTE D.H. MATSUDA
Acting Hawaii District Engineer

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

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(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Annette Matsuda, Acting Hawai'i District Engineer
State of Hawai'i Department of Transportation
50 Maka'ala Street
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106
Document Reference: HWY-H 25-2.148

Dear Ms. Matsuda,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated 08/25/25, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and notification that your department has the following comment:

The Federal Emergency Management Agency Flood Insurance Rate Map Panel 912 depicts the area of Special Flood Hazard Area Zone AE and is in an apparently different location from the previously submitted Plan Rendering. We are concerned that any redirection of

Annette Mastuda
Acting Hawaii District Engineer
State of Hawai'i, Department of Transportation
October 27, 2025
the Four Mile Creek flow will impact the downstream Panaewa Bridge on Route 11, Kanoelehua Avenue.

The design team notes that the project falls within the Special Flood Hazard Zone AE and that alterations to flow at Four Mile Creek Bridge could have downstream impacts. The intent of the project is to improve conveyance under the bridge by re-grading the channel banks to a more natural condition (similar to their condition prior to the construction of the bridge). This will help mitigate flooding impacts near the bridge. Designers are working with the Community Floodplain Managers to tailor the channel design to achieve a no-rise flood certification. Your concerns will be addressed through the no-rise analysis and process.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Alan K Thomp

JTS

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

From: paula pua <ppuala@gmail.com>
Sent: Thursday, August 28, 2025 1:08 PM
To: Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
Cc: Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>; Nicole Kapasakis <Nicole.Kapasakis@consoreng.com>
Subject: Re: Bridge replacement project

Ok sounds great

What about next week Tuesday 9/2 at 3:15? You could call me

Most important things I wanted to discuss:

Timeline when would bridge be closed and project started and how long expected to take.

Is there going to be a caution light installed or regular stop light? Photo looks like a caution light.

People tend to drive at high rates of speed coming down Kilauea toward the bridge and 3 times cars have crashed into my fence/ stonewall and into my yard. Can speed bumps be placed? Will the guard rail along my fence be removed? If so I would want that replaced once bridge is completed.

How does the 10 feet of property value get assessed since my land that is affected would need to be purchased from me, who calculates that and discusses that with me?

Will the current stone wall and privacy fence type there be replaced with the same exact material that I have? It matches the rest of the fence not in the area.

I probably will have a few more questions before we talk but those are the main ones.

Thanks!
Paula

On Thu, Aug 28, 2025 at 12:52 PM Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov> wrote:

> Hi Paula,
>
> Not a problem. My lunch break is scheduled from 12:00pm-12:45pm Mon – Fri but can be flexed to accommodate our discussion.
>
> If you could please provide your preferred dates/times to meet. Also, would you be able to provide a summary of your comments/concerns via email in advance of our discussion?
>
> Let me know if you have any questions.
>
> Thank you,
> Jacob
>
> ---
>
> **From:** paula pua <ppuala@gmail.com>
> **Sent:** Thursday, August 28, 2025 12:19 PM
> **To:** Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
> **Cc:** Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>; Nicole Kapasakis <nicole.kapasakis@consoreng.com>
> **Subject:** Re: Bridge replacement project
>
> Hey Jacob
>
> Perfect, I am working every day until the end of October, how is your lunch schedule like if I set something up over my lunch break?
>
> Thank you
> Paula
>
> On Thu, Aug 28, 2025 at 11:50 AM Sakaguchi, Jacob T.

<Jacob.Sakaguchi@hawaiicounty.gov> wrote:

> Hi Paula,
>
> Thank you for your email. I just returned to the office today.
>
> Yes, we can schedule a phone call to discuss any concerns and comments you may have regarding this project.
>
> If you could please let me know your availability and we can arrange to have a discussion.
>
> Thank you again,
> Jacob
>
> ---
>
> **From:** paula pua <ppuala@gmail.com>
> **Sent:** Tuesday, August 26, 2025 10:17 AM
> **To:** Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
> **Subject:** Bridge replacement project
>
> Aloha,
>
> My name is Paula Pua, I live at we are next to the current bridge that is one way on Kilauea and did receive the letter and photos regarding the bridge replacement. Having lived here for almost 19 years and witnessed multiple accidents many of which I have gone over and helped, not to mention, having to listen to people, yelling at each other constantly due to the one-way traffic and people getting frustrated. It's been quite annoying the way people treat each other on that bridge and my family having to listen to that. So I must say I am very excited to hear that there will be some progress on getting that bridge redone. I have a lot of questions and comments and I would prefer to speak to somebody directly rather than going back-and-forth in an email. Would that be possible? I work at Kaiser Permanente as a registered nurse and I am on vacation but I do return back to work tomorrow. I have a 8 AM to 5 PM work schedule I don't have very many days off in September so not sure when we can schedule a call possibly on my lunch break one day if not today in the afternoon? My phone number is . Definitely look forward to speaking to you regarding this bridge replacement
>
> Aloha,
> Paula

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Paula Pua
16 Alena Place
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Ms. Pua,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your email, dated 08/26/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and notification that you have questions and comments regarding project impacts at this time. During our meeting on 09/02/2025, we discussed the timeline for construction, the prevalence of accidents on and around your property, the installment of a traffic light and crosswalks, property acquisition and the stone wall/fence on your property, and the guardrail in front of your property (including correspondence to install it and whether it will be able to remain in place).

Project engineers and traffic engineers will discuss the possibility of keeping the existing guardrail in place for safety, and more information will be available as the project design progresses.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program. We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Alan K Thomp

JTS Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i, Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

From: DOH.CABPASS <DOH.CABPASS@doh.hawaii.gov>
Sent: Wednesday, August 20, 2025 8:41 AM
To: Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
Subject: Comment: Four Mile Creek Bridge Replacement, Hilo, Hawaii Island

Hello Jacob Sakaguchi
County of Hawaii Department of Public Works,

Thank you for the opportunity to review PRE-CONSULTATION FOR A DRAFT ENVIRONMENTAL ASSESSMENT, HAWAII REVISED STATUTES, CHAPTER 343 FOUR MILE CREEK BRIDGE REPLACEMENT (#22-7) PROJECT COUNTY JOB NO. E-4678 HILO, Hi. TMK: KILAUEA AVE, RIGHT-OF-WAY, HAIHAI ST. (3)2-2-048:001, (3)2-4-004:132; (3)2-2-043 PAR 30,32,43,102,104,105,106 received by mail on August 13, 2025.

Please go to the Clean Air Branch (CAB) website to download and utilize our Standard Comments for Land Use Reviews. The link is included below.

https://health.hawaii.gov/cab/clean-air-branch/standard-comments-for-land-use-reviews/

Zach Parlee | *he/him*
Environmental Health Specialist | Clean Air Branch | Planning & Administrative Support Staff (PASS)
Hawai'i State Department of Health | Ka 'Oihana Olakino
2827 Waimano Home Road #130 | Pearl City, Hawaii 96782
Office: (808) 586-4200

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Zach Parlee, Clean Air Branch
Hawai'i State Department of Health
2827 Waimano Home Road #130
Pearl City, HI, 96782

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Mr. Parlee,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your email, dated 08/20/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and notification that your department has Standard Comments for Land Use Reviews. Responses and information specific to these comments have been included in our documentation, including discussion about asbestos-containing materials.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to

Zach Parlee (he/him)
Environmental Health Specialist
Hawai'i State Dept. of Health
Clean Air Branch, Planning & Administrative Support Staff (PASS)
October 27, 2025
comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Alan K Thomp

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i, Department of Public Works

JTJ

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

From:	Quiamas, Gene
To:	Chock, Taylor; Dixon, Ryan
Cc:	Earley, Aurora; Nicole Kapasakis; Shannon Black; Kalawe, Alexander K.; Sakaguchi, Jacob T.; DeMello, Melanie
Subject:	RE: DEM Response - DEA Four Mile Creek Bridge
Date:	Friday, August 22, 2025 7:44:18 AM
Attachments:	image001.png

CAUTION: External Email

Taylor: No further comments from SWD.

From: Chock, Taylor <TChock@haleyaldrich.com>
Sent: Thursday, August 21, 2025 3:43 PM
To: Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>
Cc: Earley, Aurora <aearley@haleyaldrich.com>; Nicole Kapasakis <nicole.kapasakis@consoreng.com>; Shannon Black <shannon.black@consoreng.com>; Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>
Subject: RE: DEM Response - DEA Four Mile Creek Bridge

Aloha Gene,

Mahalo for your speedy and helpful comments! Please see our edits to the solid waste facilities section based on your comments. Please let us know if you have any additional comments or concerns; otherwise, we will include the section in the Draft EA.

Thank you very much for your feedback!
taylor

Taylor Chock
Environmental Scientist

Haley & Aldrich, Inc.
6 Waterfront Plaza
500 Ala Moana Boulevard | Suite 6-250
Honolulu, HI 96813

Office: (808) 470-2081

www.haleyaldrich.com

From: Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>
Sent: Thursday, August 21, 2025 10:49 AM

To: Chock, Taylor <TChock@haleyaldrich.com>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>
Cc: Earley, Aurora <aearley@haleyaldrich.com>; Nicole Kapasakis <nicole.kapasakis@consoreng.com>; Shannon Black <shannon.black@consoreng.com>; Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; Sakaguchi, Jacob T. <jacob.sakaguchi@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>
Subject: RE: DEM Response - DEA Four Mile Creek Bridge

CAUTION: External Email

Aloha Taylor. See attached notes/comments.

From: Chock, Taylor <TChock@haleyaldrich.com>
Sent: Thursday, August 21, 2025 9:48 AM
To: Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>
Cc: Earley, Aurora <aearley@haleyaldrich.com>; Nicole Kapasakis <nicole.kapasakis@consoreng.com>; Shannon Black <shannon.black@consoreng.com>; Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>
Subject: RE: DEM Response - DEA Four Mile Creek Bridge

Aloha Gene and Ryan,

As Niki mentioned in her email last week, Haley & Aldrich is assisting the County DPW and Consor with the Environmental Assessment and permitting for the Four Mile Creek Bridge Project. We have prepared and attached a drafted Solid Waste Facilities section that we plan to include in the EA based on your provided example and feedback. May you please review and comment on the attached work document? We appreciate any and all feedback that you are able to provide.

Mahalo!
taylor

Taylor Chock
Environmental Scientist

Haley & Aldrich, Inc.
6 Waterfront Plaza
500 Ala Moana Boulevard | Suite 6-250
Honolulu, HI 96813

Office: (808) 470-2081

www.haleyaldrich.com

From: Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>
Sent: Wednesday, August 13, 2025 3:02 PM
To: Nicole Kapasakis <nicole.kapasakis@consoreng.com>
Cc: Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>; Chock, Taylor <TChock@haleyaldrich.com>; Earley, Aurora <aearley@haleyaldrich.com>; Shannon Black <Shannon.Black@consoreng.com>; Sakaguchi, Jacob T. <jacob.sakaguchi@hawaiicounty.gov>
Subject: RE: DEM Response - DEA Four Mile Creek Bridge

CAUTION: External Email

Hello Niki. Please see notes below.

Attached is a markup of an earlier write up to give you an idea.

If would suggest you visit our website where you can find useful information for your EA write up.

From: Nicole Kapasakis <Nicole.Kapasakis@consoreng.com>
Sent: Wednesday, August 13, 2025 2:41 PM
To: Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
Cc: Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>; Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>; Chock, Taylor <tchock@haleyaldrich.com>; Earley, Aurora <aearley@haleyaldrich.com>; Shannon Black <Shannon.Black@consoreng.com>
Subject: Re: DEM Response - DEA Four Mile Creek Bridge

Thank you Jacob.

Hi Gene and Ryan, thank you for relaying this information about the Hilo landfill. I am cc-ing our regulatory POCs, Taylor and Aurora (Rory), as well in case they have any questions.
Please let us know what you would like to see in this write up. GQ: Every EA writer has a different way of presenting information and typically tailored to the project. So, best if you send us the write up and we can respond/comment accordingly. Attach is a markup of an earlier write up to give you an idea.

Thanks,
-Niki

Nicole Kapasakis, PE
PROJECT MANAGER/COASTAL ENGINEER
o: +1.808.272.9815

From: Sakaguchi, Jacob T. <Jacob.Sakaguchi@hawaiicounty.gov>
Sent: Wednesday, August 13, 2025 2:18 PM
To: Nicole Kapasakis <Nicole.Kapasakis@consoreng.com>
Cc: Kalawe, Alexander K. <AlexanderK.Kalawe@hawaiicounty.gov>; DeMello, Melanie <Melanie.DeMello@hawaiicounty.gov>; Quiamas, Gene <Gene.Quiamas@hawaiicounty.gov>; Dixon, Ryan <Ryan.Dixon@hawaiicounty.gov>
Subject: DEM Response - DEA Four Mile Creek Bridge

Hi Niki,

I received notification from our Department of Environmental Management (DEM) Solid Waste Division regarding the DEA.

They don't typically respond during the pre-consultation phase since they don't know what will be included in the EA; however, if you folks need guidance, they said that you may contact them directly - Gene and Ryan have been cc'd. Gene suggested sending over a write up to them before publishing the DEA.

Also, they wanted to pass along information that the Hilo landfill is no longer active/accepting waste.

Let me know if you have any questions

Gene, please chime in as you see fit or if I missed something.

Thank you,
Jacob

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS
Aupuni Center
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public_works@hawaiicounty.gov

October 27, 2025

Attention: Gene Quiamas
345 Kekūanāo'a Street, Suite 41
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Mr. Quiamas,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your email, dated 8/13/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and offer for your department to review verbiage related to Solid Waste, and for the notification regarding closure of the Hilo landfill. During the period between August 21st and 22nd of 2025, you provided feedback on drafted verbiage, and the Solid Waste section of the DEA was finalized with your suggestions incorporated.

The County of Hawai'i is preparing the DEA and your comments will be included in the final document. The public will have another opportunity to comment on the DEA, when

Gene Quiamas
Environmental Compliance Spclt
County of Hawai'i, DEM Solid Waste Division
October 27, 2025
published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

Sincerely yours,

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i, Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
Office of Conservation and Coastal Lands
P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RYAN K.P. KANAKA'OLE
FIRST DEPUTY

CIARA W.K. KAHAHANE
DEPUTY DIRECTOR - WATER

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

REF:OCCL:MK

COR HA 26-29
Aug 21, 2025

MEMORANDUM

TO: Alexander K. Kalawe, P.E., Acting Engineering Division Deputy Chief
Attn: Jacob Sakaguchi
County of Hawai'i Department of Public Works

FROM: (for) S. Michael Cain, Administrator
Office of Conservation and Coastal Lands

SUBJECT: COR HA 26-29 Pre-Consultation for Draft Environmental Assessment Regarding the Proposed Four Mile Creek Bridge Replacement Project
Located in Waiakea, South Hilo, Island of Hawai'i
Tax Map Keys (TMKs): (3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043 Parcels 30, 31, 32, 43, 102, 104, 105, and 106.

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter regarding the subject matter. According to your letter, the County of Hawai'i Department of Public Works is preparing a draft environmental assessment (DEA) for the Four Mile Creek Bridge Replacement project.

It appears that parcels (3) 2-2-048:001 and (3) 2-4-004:132, and possibly a small portion of parcel (3) 2-2-043:102 appear to lie within the General Subzone of the State Land Use Conservation District, while the remaining parcels appear to lie within the Urban District. If you require official confirmation of the subject parcels' State Land Use District designation, you may want to consult with the State of Hawai'i Land Use Commission.

According to the information provided, the project includes replacing the existing single-lane bridge with a modern single-span concrete girder bridge, more than three times the width of the existing. The widened bridge will be able to accommodate two vehicle lanes, bicycle lanes, and raised pedestrian walkways in both directions. The project aims to alleviate traffic delays, raise the elevation of the project to prevent flooding, and upgrade guardrail and safety features to conform with current design standards.

The applicant states that in order to accommodate the increased width of the bridge and bridge approaches, the County will likely require acquisition of the parts of the adjacent parcels along the shoulders of Kīlauea Avenue.

Additionally, the project proposes the installation of a traffic signal at the Kīlauea Avenue and Haihai Street intersection immediately north of the bridge. The total project area is approximately 8.7 acres, comprised of 3.7 acres surrounding the bridge and five acres of the Pana'ewa Farm Lot, proposed as a staging area.

The OCCL regulates land uses within the State Land Use Conservation District through the issuance of Conservation District Use Permits and Site Plan Approvals to help conserve, protect, and preserve important natural and cultural resources.

In reference to the proposed improvements that lie within the Right-Of-Way (ROW) the OCCL will defer to County authority.

Based on the information you have provided, it appears proposed work and land uses are proposed outside of the County's ROW and within the Conservation District. Proposed work and land uses in the Conservation District will require review and potentially authorization from the Department or the Board of Land and Natural Resources prior to work being initiated.

You may want to refer to our rules, Hawai'i Administrative Rules (HAR) Title 13 Chapter 5, which can be found at our website at https://dlnr.hawaii.gov/occl/rules/.

At this time, we will reserve further comments or formal determination(s) regarding the project for when the DEA is circulated for public and agency review and comments.

OCCL requests the DEA describe in detail proposed work in the Conservation District and that the proposed plans clearly delineate the ROW and proposed work in the Conservation District.

Should you have any questions, please contact Mari Kurosawa of our Office at mari.i.kurosawa@hawaii.gov or at (808) 587-0381.

CC: Hawai'i District Land Office
County of Hawai'i Department of Planning

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Michael Cain, Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106
Document Reference: COR HA 26-29

Dear Mr. Cain,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated 08/21/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and notification that proposed work and land uses in the Conservation District will require review and authorization from the Department or the Board of Land and Natural Resources prior to work being initiated. This project will file a Conservation District Use Permit Application subject to advisement from your office on the appropriate permitting level in accordance with the Hawai'i Administrative Rules Chapter 13-5 definition of the accepted land use.

Michael Cain
Administrator
State of Hawai'i, DLNR
Office of Conservation and Coastal Lands
October 27, 2025

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Keone Thompson, P.E.
JTS Engineering Division Chief
County of Hawai'i, Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

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

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARY ALICE EVANS
DIRECTOR

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

Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Branch

DTS 202508111424NA
Transmitted via email

August 27, 2025

Mr. Jacob Sakaguchi
County of Hawai'i Department of Public Works
Engineering Division
101 Pauahi St. Suite 7
Hilo, Hawai'i 96720-4224

Dear Mr. Sakaguchi:

Subject: Pre-Consultation for a Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
TMKs: (3) 2-2-048:001; (3) 2-4-004:132, (3) 2-2-043 Parcels 30, 31, 32, 43, 102, 104, 105, 106

The Office of Planning and Sustainable Development (OPSD) received the Environmental Assessment Early Consultation letter requesting comments for the preparation of a Draft Environmental Assessment (DEA) for the Four Mile Creek Bridge Replacement Project.

OPSD appreciates the opportunity to review the project background, map, and rendering.

OPSD anticipates that the DEA will discuss the Proposed Action with respect to the policies and objectives outlined in Hawai'i Revised Statutes (HRS) Chapters 205A and 226, the Coastal Zone Management and Hawai'i State Planning Act, respectively. As the 2050 Sustainability Plan was prepared to guide the attainment of sustainability and resilience goals and objectives for the State contained in HRS Chapter 226, OPSD recommends the DEA generally discuss the technologies and best practices and other mitigation measures for the Proposed Action that would advance the implementation of the Recommended Actions in the 2021-2030 Focus Areas on pages 100-107 of the *Hawai'i 2050 Sustainability Plan*.

We look forward to reviewing the future environmental assessment for the project. If you have any questions regarding this comment letter, please contact Seiji Ogawa, Land Use Division at seiji.ogawa@hawaii.gov or, (808) 587-2898.

Mahalo,

Mary Alice Evans

Mary Alice Evans
Director

c: Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Mary Alice Evans, Director
Office of Planning and Sustainable Development
P.O. Box 2359
Honolulu, HI 96804

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106
Document Reference: DTS 202508111424NA

Dear Ms. Evans,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated 08/27/2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response and confirm that the DEA will incorporate policies and objectives outlined in Hawai'i Revised Statutes (HRS) Chapters 205A and 226, the Coastal Zone Management and Hawai'i State Planning Act, respectively. The DEA will also incorporate discussion of the technologies and best practices and other mitigation measures for the Proposed Action; as per the Recommended Actions in the 2050 Sustainability Plan.

Mary Alice Evans
Director
State of Hawai'i, OPSD
October 27, 2025

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Alan K Thompson

Keone Thompson, P.E.
JTC Engineering Division Chief
County of Hawai'i Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

August 12, 2025

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
__ Div. of Boating & Ocean Recreation richard.t.howard@hawaii.gov)
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
__ Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (candace.m.martin@hawaii.gov)
__ Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Ian C. Hirokawa, Acting Land Administrator
SUBJECT: Pre-Consultation for a Draft Environmental Assessment (DEA) for the Four Mile Bridge Replacement Project, Hawai'i
LOCATION: Hilo, Hawai'i TMK: (3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043 Parcels 30, 31, 32, 43, 102, 104, 105, 106
APPLICANT: County of Hawai'i Department of Public Works, applicant

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **September 8, 2025.** If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Raymond Severn at raymond.severn@hawaii.gov. Thank you.

BRIEF COMMENTS:

(X) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: _____
Print Name: Candace Martin
Division: Land-HDLO
Date: August 25, 2025

Attachments
cc: Central Files

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Candace Martin
Hilo District Land Office
Department of Land and Natural Resources - Land Division
180 Kalanikoa Street
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Ms. Martin,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your memorandum, dated August 25, 2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your response which notes that the Department of Land and Natural Resources Land Division has no objections to the project.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to

Candace Martin
State of Hawai'i, DLNR
Land Division
October 27, 2025

comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES | KA 'OIHANA KUMUWAIWAI 'ĀINA
COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
P.O. BOX 621
HONOLULU, HAWAII 96809

Sept 3, 2025

REF: RFD.6501.8

TO: Mr. Ian Hirokawa, Acting Administrator
Land Division

FROM: Ciara W.K. Kahahane, Deputy Director
Commission on Water Resource Management

SUBJECT: Four Mile Creek Bridge Replacement (#22-7) Project

FILE NO.: RFD.6501.8
TMK NO.: (3) 2-2-043:030, (3) 2-2-048:001, (3) 2-4-004:132, 322043

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

- [ ] 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
- [ ] 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- [ ] 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.
- [ ] 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.
- [X] 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/
- [ ] 6. We recommend the use of alternative water sources, wherever practicable.
- [ ] 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.
- [ ] 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

- [X] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [ ] 11. The Hawaii Water Plan is directed toward the achievement of the utilization of reclaimed water for uses other than drinking and for potable water needs in one hundred per cent of State and County facilities by December 31, 2045 (§174C-31(g)(6), Hawaii Revised Statutes). We strongly recommend that this project consider using reclaimed water for its non-potable water needs, such as irrigation. Reclaimed water may include, but is not limited to, recycled wastewater, gray water, and captured rainwater/stormwater. Please contact the Hawai'i Department of Health, Wastewater Branch, for more information on their reuse guidelines and the availability of reclaimed water in the project area.
- [ ] 12. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 13. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 14. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 15. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [ ] 16. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [ ] 17. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [ ] 18. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 19. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

- [ ] OTHER:

If you have any questions, please contact Ryan Imata of the Groundwater Regulation Branch at (808) 587-0225 or Katie Roth of the Planning Branch (808) 587-0216.

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

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(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Ciara W.K. Kahahane, Deputy Director
Commission on Water Resource Management
P.O. Box 621
Honolulu, HI 96809

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106
REF: RFD.6501.8

Dear Ms. Kahahane,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated September 3, 2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7) (File No. RFD.6501.8).

We thank you for your response which recommends:

5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events.

Ciara W.K. Kahahane
Deputy Director
State of Hawai'i, DLNR CWRM
October 27, 2025

Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

In response, we note that BMPs for stormwater management will be included in the project design in accordance with applicable federal, state, and county standards. We anticipate obtaining a National Pollutant Discharge Elimination System Notice of General Permit Coverage for Discharges of Storm Water Associated with Construction Activities under Hawai'i Administrative Rules Chapter 11-55, during which the State Department of Health will review the project for potential ground or surface water degradation/contamination. We appreciate the information shared about stormwater management BMPs for low impact development.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Keone Thompson, P.E.
JTS
Engineering Division Chief
County of Hawai'i, Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
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COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

August 12, 2025

MEMORANDUM

FROM ~~TO~~: **DLNR Agencies:**

- X Div. of Aquatic Resources (kendall.l.tucker@hawaii.gov)
- ___Div. of Boating & Ocean Recreation richard.t.howard@hawaii.gov)
- X Engineering Division (DLNR.ENGR@hawaii.gov)
- X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
- ___Div. of State Parks (curt.a.cottrell@hawaii.gov)
- X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
- X Land Division – Hawaii District (candace.m.martin@hawaii.gov)
- ___Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO ~~FROM~~: Ian C. Hirokawa, Acting Land Administrator

SUBJECT: Pre-Consultation for a Draft Environmental Assessment (DEA) for the Four Mile Bridge Replacement Project, Hawai'i

LOCATION: Hilo, Hawai'i TMK: (3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043 Parcels 30, 31, 32, 43, 102, 104, 105, 106

APPLICANT: County of Hawai'i Department of Public Works, applicant

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **September 8, 2025.** If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Raymond Severn at raymond.severn@hawaii.gov. Thank you.

BRIEF COMMENTS:

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

Signed:
Print Name: Dina U. Lau, Acting Chief Engineer
Division: Engineering Division
Date: Sep 8, 2025

Attachments
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Ian C. Hirokawa

Ref: Pre-Consultation for a Draft Environmental Assessment (DEA) for the Four Mile Bridge Replacement Project, Hawai'i
Location: Hilo, Hawai'i
TMK(s): (3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043 Parcels 30, 31, 32, 43, 102, 104, 105, 106
Applicant: County of Hawai'i Department of Public Works

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.

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

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
DINA U. LAU, ACTING CHIEF ENGINEER

Date: Sep 8, 2025

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS
Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Dina U. Lau, Acting Chief Engineer
Engineering Division, Department of Land and Natural Resources
1151 Punchbowl Street, Room 221
Honolulu, HI 96813

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Ms. Lau,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated September 8, 2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7) (File No. RFD.6501.8).

We thank you for your response which states that:
The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project.

The design team notes that the project falls within the Special Flood Hazard Zone AE and that alterations to flow at Four Mile Creek Bridge could have downstream impacts. The

intent of the project is to improve conveyance under the bridge by re-grading the channel banks to a more natural condition (similar to their condition prior to the construction of the bridge). This will help mitigate flooding impacts near the bridge. Designers are working with the Community Floodplain Managers to tailor the channel design to achieve a no-rise flood certification. Your concerns will be addressed through the no-rise analysis and process.

Your comments are an important part of the environmental review process and will be incorporated into an appendix of the DEA. The public will have another opportunity to comment on the DEA when it is published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

We appreciate your input and look forward to your continued involvement in the environmental review process.

Sincerely yours,

Alan K Thompson

JTS

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

West Hawai'i Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

Jeffrey W. Darrow
Director

Michelle S. Ahn
Deputy Director

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

September 19, 2025

County of Hawai'i, Department of Public Works
Engineering Division
Attn: Jacob Sakaguchi
101 Pauahi Street, Suite 7
Hilo, HI 96720-4224
Email: Jacob.Sakaguchi@hawaiicounty.gov

Dear Mr. Kalawe:

SUBJECT: Pre-Consultation for a Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343 (PL-ENV-2025-000047)
Applicant: County of Hawai'i, Department of Public Works
Project: Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
TMK: Kīlauea Ave. right- of-way; Haihai St. right- of-way
(3) 2-2-048:001; (3) 2-4-004:132; (3) 2-2-043:030, 031, 032, 043, 102, 104, 105, 106 South Hilo District, Island of Hawai'i

Please accept this letter in response to your email dated August 8, 2025, inviting participation in the early consultation process of the draft Environmental Assessment for the Four Mile Creek Bridge Replacement project, pursuant to Hawai'i Revised Statutes Chapter 343 and Hawai'i Administrative rules (HAR) Section 200.1. We apologize for the delay in responding. The project proposes to replace, raise, and widen the Four Mile Creek Bridge to accommodate roadway and pedestrian facility improvements along the adjacent segments of Kīlauea Avenue and Haihai Street.

The subject parcel Tax Map Key (TMK) (3) 2-2-048:001 is approximately 7.855 acres. The parcel is designated as Conservation by the State Land Use Commission, the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) map designation is Conservation and is located in the Hawai'i County's Open (O) zoning district. This parcel is not situated within the Special Management Area (SMA).

The subject parcel Tax Map Key (TMK) (3) 2-4-004:132 is approximately 6.876 acres. The parcel is designated as Conservation by the State Land Use Commission, the Hawai'i County

General Plan Land Use Pattern Allocation Guide (LUPAG) map designation is Conservation and is zoned Agricultural 10-acres (A-10a). This parcel is not situated within the Special Management Area (SMA).

Tax Map Keys (TMK) (3) 2-2-043:030, 031, 032, 043, 102, 104, 105 and 106 are identified as being a part of the project area. The parcels are designated as Urban by the State Land Use Commission, the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) map designation is Low Density Urban (ld.) and zoned as Single-Family Residential District (RS-10).

The Planning Department offers the following comments and recommendations for the preparation of the Environmental Assessment:

- The Four Mile Creek Bridge was constructed over 50 years ago; therefore, it is recommended that this project be reviewed in relation to Section 106 of the National Historic Preservation Act to determine any potential considerations for historic or cultural resources.
- The parcel is not located within the existing boundaries of the Coastal Zone Management Special Management Area; however, its proximity to the stream may allow for potential impacts to the river or downstream to Hilo Bay. Please include how the project considers this and plans to address pre- and post-development stormwater, runoff and leaching from impacting water quality.
- We encourage the removal of invasive species and the use of native species in the comprehensive design and function of the project's landscaping.

If you have any questions about this correspondence, please contact Shannon Arquitola at (808) 961-8137 or via email at Shannon.arquitola@hawaiicounty.gov .

Sincerely,

Jeffrey W. Darrow
Jeffrey W. Darrow (Sep 19, 2025 09:28:16 HST)

JEFFREY W. DARROW
Planning Director

SA:ad
V:\PL\PL\planning\public\wpwin60\CH343\2025\PL-ENV-2025-000047 Four Mile Creek Bridge Replacement (DPW Eng)

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

October 27, 2025

Attention: Jeffrey Darrow, Planning Director
County of Hawai'i Planning Department
East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, HI 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Mr. Darrow,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated September 19, 2025, responding to our request for pre-consultation for the Draft Environmental Assessment (DEA) of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your comments and provide responses below:

- *The Four Mile Creek Bridge was constructed over 50 years ago; therefore, it is recommended that this project be reviewed in relation to Section 106 of the*

National Historic Preservation Act to determine any potential considerations for historic or cultural resources.

A Section 404 Permit will be sought and thus will trigger a federal action. The USACE, as the lead federal agency, will conduct the Section 106 consultation process as part of the Section 404 review process and determine any potential considerations for historic or cultural resources. A Literature Review and Field Investigation was conducted for this project, and results will be detailed and incorporated within the DEA. The project is also undergoing HRS Chapter 6E-8 Review with the State Historic Preservation Division.

- *The parcel is not located within the existing boundaries of the Coastal Zone Management Special Management Area; however, its proximity to the stream may allow for potential impacts to the river or downstream to Hilo Bay. Please include how the project considers this and plans to address pre- and post-development stormwater, runoff and leaching from impacting water quality.*

Best Management Practices related to downstream impacts from construction will be incorporated into the project design and DEA. Four Mile Creek flows away from Hilo Bay through an unlined flood control channel that was constructed by the County of Hawai'i. This 10,000-foot-long flood channel starts east of the project site, beginning at the bridge spanning Highway-11, and flows through open land with scattered pockets of mixed residential structures and farmland before emptying into an undeveloped lava field. Thus, water from the project site does not empty into Hilo Bay.

- *We encourage the removal of invasive species and the use of native species in the comprehensive design and function of the project' s landscaping.*

A biological survey of the project area documented mainly non-native species. Should the final project design include landscaping, native species replanting will be incorporated where possible.

The County of Hawai'i is preparing a DEA and your comments will be included in the final document. The public will have another opportunity to comment on the DEA, when published in the *Environmental Notice* by the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program.

Jeffrey Darrow
Planning Director
County of Hawai'i, Planning Department
October 27, 2025
Sincerely yours,

Keone Thompson
JTJ
Engineering Division Chief
County of Hawai'i, Department of Public Works

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

October 16, 2025

TO: Mr. Neil Azevedo, Acting Deputy Director
ATTENTION: JACOB SAKAGUCHI
County of Hawai'i, Department of Public Works

FROM: Keith K. Okamoto, Manager-Chief Engineer

SUBJECT: Pre-Consultation for a Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Tax Map Key 2-2-048:001, 2-4-004:132, 2-2-043:030, 031, 032, 043, 102, 104, 105, 106

This is in response to the Pre-Consultation letter.

Please be informed that there are two (2) existing 8-inch waterlines within Kīlauea Avenue from the intersection with Haihai Street headed north and only one (1) existing 8-inch waterline heading south. There is also an existing 6-inch, 10-inch, and 16-inch waterline within Haihai Street from the intersection with Kīlauea Avenue heading west and an existing 6-inch and 16-inch waterline heading east into TMK 2-2-043:043.

The Department requests that construction plans be submitted for review and approval as there are existing waterlines within the proposed project limits. The applicant/contractor will be responsible for the cost of relocating or modifying any of our water system facilities within the project area, should it be necessary.

Should there be any questions, please contact Ms. Robyn Matsumoto of our Water Resources and Planning Branch at (808) 961-8070, extension 255.

Sincerely yours,

Keith K. Okamoto, P.E.
Manager-Chief Engineer

RM:dfg

copy - Planning Department

C. Kimo Alameda, Ph.D.
Mayor

William V. Brilhante, Jr.
Managing Director

Neil A. Azevedo
Acting Director

County of Hawai'i

DEPARTMENT OF PUBLIC WORKS

Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
public_works@hawaiicounty.gov

November 3, 2025

Attention: Keith K. Okamoto, Manager-Chief Engineer
County of Hawai'i, Department of Water Supply
345 Kekuanao'a Street, Suite 20
Hilo, Hawai'i 96720

Subject: Response to Received Pre-Consultation for Draft Environmental Assessment
Hawai'i Revised Statutes, Chapter 343
Four Mile Creek Bridge Replacement (#22-7) Project
County Job No. E-4678
Hilo, Hawai'i Island, HI
Tax Map Keys (TMKs): Kīlauea Ave. right-of-way; Haihai St. right-of-way (3)2-2-048:001; (3)2-4-004:132; (3)2-2-043, Parcels 30, 31, 32, 43, 102, 104, 105, 106

Dear Mr. Okamoto,

The County of Hawai'i Department of Public Works (DPW) is in receipt of your letter, dated October 16th, 2025, responding to our request for pre-consultation for the Draft Environmental Assessment of the Four Mile Creek Bridge Replacement Project (#22-7).

We thank you for your comments and provide responses below:

- *Please be informed that there are two (2) existing 8-inch waterlines within Kilauea Avenue from the intersection with Haihai Street headed north and only one (1) existing 8-inch waterline heading south. There is also an existing 6-inch, 10-inch, and 16-inch waterline within Haihai Street from the intersection with Kilauea Avenue*

heading west and an existing 6-inch and 16-inch waterline heading east into TMK 2-2-043:043.

Thank you for this information about existing waterlines. The design team confirms that they are reflected accurately in the project design. The proposed action requires the relocation of the 8-inch waterline heading south of the intersection. There will be no impacts to the remaining water lines on Kilauea Avenue and Haihai Street, besides adjusting the existing water valve boxes and lids to finished grade.

- *The Department requests that construction plans be submitted for review and approval as there are existing waterlines within the proposed project limits. The applicant/contractor will be responsible for the cost of relocating or modifying any of our water system facilities within the project area, should it be necessary.*

60% Construction plans will be submitted to DWS for review and approval. Modifications to waterlines will be coordinated with DWS. The applicant/contactor will be responsible for costs incurred for relocating or modifying any water system facilities within the project area related to construction of the Four Mile Creek Bridge Replacement project.

The County of Hawai'i s preparing a Draft Environmental Assessment (DEA) and your comments will be included in the final document. The public will have another opportunity to comment on the DEA, when published in the public register.

Sincerely yours,

Alan K Thompson

Keone Thompson, P.E.
Engineering Division Chief
County of Hawai'i Department of Public Works

JTS

cc: Jacob Sakaguchi, County of Hawai'i DPW
Alexander Kalawe, County of Hawai'i DPW
Nicole Kapasakis, Consor Engineers, LLC
Taylor Chock, Haley & Aldrich, Inc.