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IN REPLY REFER TO:
HWY-PA 2.7204

December 13, 2021

SUBMIT ONLINE: https://health.hawaii.gov/oeqc/submittal-form/

TO: MARY ALICE EVANS
DIRECTOR
ENVIRONMENTAL REVIEW PROGRAM
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

FROM: JADE T. BUTAY
DIRECTOR OF TRANSPORTATION

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT AND
FINDING OF NO SIGNIFICANT IMPACT FOR
KAMEHAMEHA HIGHWAY PEDESTRIAN SAFETY PROJECT
VICINITY OF LANIAKEA BEACH
HALEIWA, ISLAND OF OAHU, HAWAII

The Hawaii Department of Transportation has reviewed all comments received during the 30-day comment period for the Draft Environmental Assessment for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach situated in the vicinity of Haleiwa, on the island of Oahu and has determined that preparation of an Environmental Impact Statement is not required for the project pursuant to the significance criteria specified in Section 11-200.1-13 of the Hawaii Administrative Rules. We hereby issue a Finding of No Significant Impact (FONSI), as documented in the Final Environmental Assessment (FEA).

Please publish the FEA and FONSI determination in the next available edition of the Environmental Notice.

If there are any questions, please contact Brian Tyau, Project Manager, Highways Division, Planning Branch at (808) 587-6390 or by email at Brian.Tyau@hawaii.gov.

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Thursday, December 16, 2021 3:39:07 PM

Action Name

Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea

Type of Document/Determination

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

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district
- (3) Propose any use within a shoreline area

Judicial district

Waialua, Oʻahu

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

Kamehameha Highway (Route 83) right-of-way (ROW);
6-1-005: 026; 024;
6-1-009: 004; 021; 022; and
6-1-010:019; 020.

Action type

Agency

Other required permits and approvals

HRS Chapter 6E-8 Review, Special Management Area Use Permit and Shoreline Setback Variance, Subdivision Application, National Pollutant Discharge Elimination System for Stormwater Discharges Associated with Construction Activities, Community Noise Permit, Community Noise Variance, Grading, Grubbing, Stockpiling, and Excavation Permit

Proposing/determining agency

State of Hawaii Department of Transportation, Highways Division

Agency contact name

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Map It

Was this submittal prepared by a consultant?

Yes

Consultant

WSP USA Inc.

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Map It

Action summary

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing roadway improvements to address pedestrian safety, shoreline erosion, congestion, and roadway reliability along Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the island of Oahu. The proposed action generally consists of realigning the roadway inland by about 80 feet from its current location from the Haleiwa side of Lauhulu Stream Bridge to the Haleiwa side of Kawailoa Stream Bridge.

Reasons supporting determination

See Section 5.0 of the EA.

Attached documents (signed agency letter & EA/EIS)

- 2021-12-16_FinalEA-KamHwyPedSafety.pdf
- HWY-PS-2.7204-Kamehameha-Highway-Safety-Improvements-Project-FEA_FONSI-part-1-signed.pdf

Shapefile

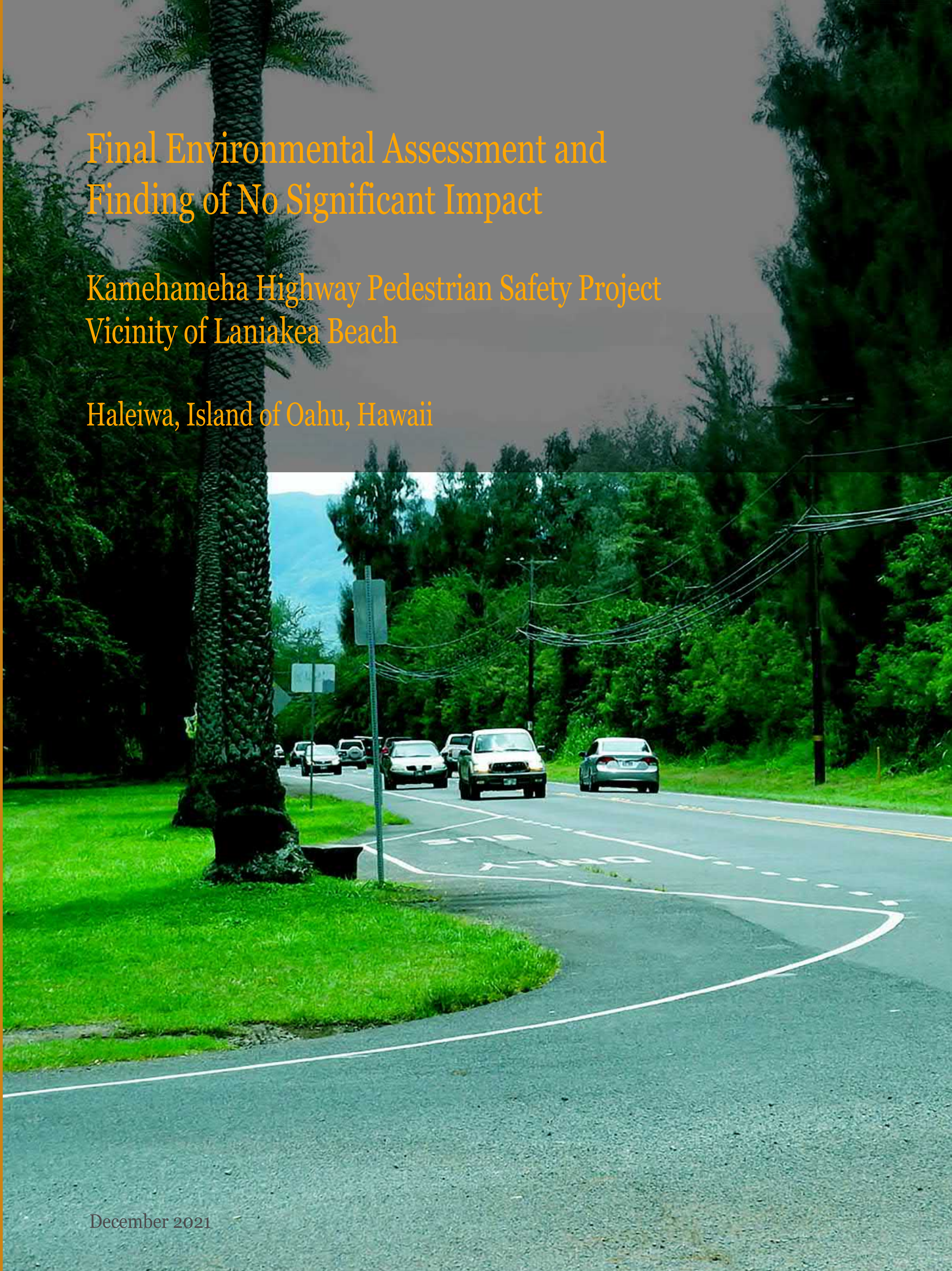
- The location map for this Final EA is the same as the location map for the associated Draft EA.

Authorized individual

Rachel E. Adams

Authorization

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



Final Environmental Assessment and Finding of No Significant Impact

Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach

Haleiwa, Island of Oahu, Hawaii

December 2021

FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT
Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach
Haleiwa, Island of Oahu, Hawaii

Submitted Pursuant to the:

Hawaii Environmental Policy Act,
Chapter 343, Hawaii Revised Statutes, and
Title 11, Chapter 200.1, Hawaii Department of Health Administrative Rules

by the:

Department of Transportation, Highways Division
State of Hawaii

The following person may be contacted for additional information concerning this document:

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This Final Environmental Assessment provides the supporting analysis for the Hawaii Department of Transportation, Highways Division's Finding of No Significant Impact for the Kamehameha Highway Pedestrian Safety Project in the vicinity of Laniakea Beach. The project proposes to address pedestrian safety as well as shoreline erosion, congestion, and the reliability of highway operations by realigning the Highway inland within the project limits.

December 2021

EXECUTIVE SUMMARY

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing roadway improvements to address pedestrian safety, shoreline erosion, congestion, and roadway reliability along Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the island of Oahu. The project reach is approximately 1,000 feet in length and lies at the Northeast end of Laniakea Beach. As pedestrian safety is the primary purpose, the proposed project is referred to as the "Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach".

The proposed project requires environmental review in accordance with Hawaii Revised Statutes (HRS) Chapter 343 because it would involve State funds, use of State and County lands, use of land classified as a conservation district, as well as use of shoreline areas. As an agency action, the State of Hawaii Department of Transportation, Highways Division is responsible for preparing this document which must comply with Hawaii Administrative Rules (HAR) Title 11, Chapter 200.1.

Four conditions are analyzed in this Final EA: The No Build, the No Build Settlement, Transportation System Management (TSM) Alternative, and the Pedestrian Shift Alternatives. The No Build and No Build Settlement serve as two baselines for comparison against the TSM and Pedestrian Shift Alternatives. The No Build Settlement Alternative was implemented by the City and County of Honolulu's Department of Parks and Recreation (DPR) as this document was being finalized in November 2021. The Pedestrian Shift Alternative is the preferred alternative.

This Final Environmental Assessment (EA) discloses the foreseeable environmental and social impacts that could result from the project's implementation and commits to the employment of specific measures to prevent, minimize, or mitigate adverse impacts to the environment.

Table ES-1 provides a summary of the potential impacts and the proposed measures to avoid, minimize, or mitigate those potential effects.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.1 Physical Geography and Coastal Processes	Coastal Erosion: Kamehameha Highway could erode away in the near future. Sea Level Rise: Flooding and Potential Disruption of Service Flood and Tsunami Hazard: Highway would remain in Flood Hazard Area and Tsunami Evacuation Zone.	Coastal Erosion: Same as No Build. Sea Level Rise: Same as No Build. Flood and Tsunami Hazard: Same as No Build.	Coastal Erosion: Same as No Build, which does not meet project purpose. Sea Level Rise: Same as No Build, which does not meet project purpose. Flood and Tsunami Hazard: Same as No Build, which does not meet project purpose.	Coastal Erosion: Protects Highway from coastal erosion impacts. Sea Level Rise: Minimizes extent of flooding on Highway caused by 3.2-foot sea level rise. Flood and Tsunami Hazard: Properties near Lauhulu Stream Bridge, owned by Kamehameha Schools, and the City and County of Honolulu's Department of Parks and Recreation (City DPR) may experience a shallow increase of wave surface inundation. No habitable structures would be affected. The detected changes would not be experienced at a scale that would require changes to flood or FIRM maps.	None proposed.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.2 Land Use	No impact.	No impact	No impact.	Requires approximately three (3) acres from undeveloped City DPR property and Kamehameha Schools ranch property. Kawailoa Ranch's pasture land and riding trails would be affected.	Planning and design has been and will continue to be coordinated with property owners. Real property would be procured in accordance with federal, State, and local regulations.
3.3 Historic and Archaeological Resources	No impact.	No impact	No impact	Site T-1 would be avoided. Lauhulu Stream Bridge would not be directly affected, but the change in use and alteration of the surrounding environment would be considered an effect in accordance with HAR 13-275.	Effect with mitigation based on impacts to Lauhulu Stream Bridge. Proposed mitigation is preservation in the form of avoidance and protection. Archaeological Monitoring will be conducted as agreed upon between HDOT and the State Historic Preservation Division (SHPD).
3.4 Cultural Resources	No impact.	No impact	No impact	Less than significant. No cultural resources identified, except for Site T-1, which will be avoided. Although no iwi kupuna have been encountered, cultural practitioners expressed concerns for impacts to Kamehameha Schools property, and iwi kupuna.	Archaeological monitoring will be conducted. See Section 3.3. HDOT will continue to coordinate with Kamehameha Schools and affected lessees as design progresses.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.5 Biological Resources	No impact.	No impact.	No impact.	No threatened or endangered species observed within project area. Although, protected seabirds, Hawaiian Hoary Bats, and Hawaiian Green Sea Turtles may be affected by nighttime lighting and construction activities. Incorporation of Standard Construction Best Management Practices (BMPs) will minimize the potential impacts to less than significant.	BMPs will be employed during construction. See Section 3.16.5.
3.6 Surface Water Resources	No impact.	No impact.	No impact.	Less than significant. No work will be done within the U.S. Army Corps of Engineers' (USACE) jurisdiction. Project will remove impervious surface from coastline, resulting in overall reduction in storm water run-off and improved water quality.	Contractor will be required to illustrate how they would achieve work without placing materials in the stream. See Section 3.16.4 for Water Resources during Construction.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.7 Parks and Recreational Resources	No impact.	No impact.	TSM Alternative would not affect the City DPR's ability to develop the Laniakea Beach Support Park in the future.	The Pedestrian Shift Alternative was designed recognizing the City DPR's potential future park use. It will not preclude the City DPR from developing a formal parking area or beach support amenities. See Section 3.16 for Construction Impacts. Laniakea Beach will remain open and accessible to the public throughout the duration of construction. Public access to City DPR's parking area will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary.	None proposed.
3.8 Visual and Aesthetic Resources	No impact.	No impact.	No impact.	No impact.	None proposed.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.9 Roadways and Traffic	Traffic would continue to be congested.	Traffic Congestion would be improved over the No Build, assuming that pedestrians use the crosswalks.	Traffic Congestion would be improved similar to the No Build Settlement.	The Pedestrian Shift Alternative will improve traffic congestion.	None proposed. The proposed project in itself is a mitigation measure.
3.10 Pedestrian Safety	No change to safety conditions would occur.	Pedestrians could cross at crosswalks, potentially reducing pedestrian accidents.	Parking would be eliminated on the mauka side of the Highway at Laniakea Beach. Cars may park along Kamehameha Highway for a distance on either side of Laniakea Beach, creating conditions where people walk along the narrow Highway shoulder for long distances.	Pedestrians will no longer need to cross the Highway to access Laniakea Beach, eliminating concerns for pedestrian safety at Laniakea Beach.	None proposed.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.11 Public Facilities and Services	Traffic congestion would hinder effectiveness of emergency response. Additionally, Kamehameha Highway would not be reliable during high surf weather events.	Traffic congestion would be improved over the No Build, thus effectiveness of emergency response would be slightly better than the No Build. Kamehameha Highway would not be reliable during high surf weather events.	Traffic congestion would be similar or slightly better than the No Build Settlement, thus effectiveness of emergency response would be similar or slightly better than the No Build Settlement. Kamehameha Highway would not be reliable during high surf weather events.	Pedestrian Shift Alternative will be most effective at reducing delays or congestion. Improved traffic allows for better efficiency for emergency vehicles. Additionally, the wider right-of-way allows vehicles to pull-over so that emergency vehicles can get through. Kamehameha Highway will remain open during periods of high surf to serve emergency needs.	None proposed.
3.12 Noise Impacts	Thirteen residences, Laniakea Beach, and Chun's Reef experience noise impacts because the ambient environment approaches or exceeds the Noise Abatement Criteria (NAC).	Noise Impacts are the same as the No Build.	Noise Impacts are the same as the No Build and No Build Settlement.	Less than significant. The Pedestrian Shift Alternative reduces the number of affected noise-sensitive receptors to 5 residences and Chun's Reef.	TSM: Although Pedestrian Shift is preferred, should HDOT decide to implement the TSM Alternative, HDOT's Noise Policy and Guidelines require that an evaluation for noise abatement be conducted. Pedestrian Shift: Noise Barriers will not be feasible thus no mitigation is proposed.
3.13 Hazardous Materials	No impact.	No impact.	No impact.	No impact.	None proposed.
3.14 Air Quality	No impact.	No impact.	No impact.	No impact.	None proposed.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.15 Social and Economic Conditions	No impact.	Benefits will include a safer roadway, ease of mobility, and an overall enhancement in the quality of life.	Benefits will include a safer roadway, ease of mobility, and an overall enhancement in the quality of life.	Benefits will include a safer roadway, ease of mobility, and an overall enhancement in the quality of life.	None proposed
3.16 Construction Impacts	No impact.	No impact.	No impact.	Less than significant. Short-term, temporary disruptions may occur to various resources but will not result in long-term effects.	General good housekeeping practices will be implemented for consideration of all resources.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

Section Page

APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing roadway improvements to address pedestrian safety, shoreline erosion, congestion, and roadway reliability along Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the island of Oahu (see Figure 1-1). The project reach is approximately 1,000 feet in length and lies at the Northeast end of Laniakea Beach. As pedestrian safety is the primary purpose, the proposed project is referred to as the "Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach".

When this project was initiated in 2011, it was called the "Kamehameha Highway Realignment, Vicinity of Laniakea Beach". At the time, the primary purpose was to address shoreline erosion, and roadway reliability. HDOT approached the project's development by implementing a Context Sensitive Solutions (CSS) process, in which HDOT worked extensively with the affected communities. The goal was to provide an opportunity for the varying stakeholders to be involved at the earliest stages of project planning. To accomplish this goal, HDOT convened a task force comprised of a cross-section of the North Shore community to develop community-driven solutions to transportation issues that they identified, understanding that this location along Kamehameha Highway was an established priority in the 2003 Statewide Highway Shoreline Protection Study for sustained damage from wave-driven erosion (Edward K. Noda Associates, 2003). Section 1.4 summarizes relevant portions of the project's history.

HDOT re-prioritized project objectives when a young boy was hit by a car crossing Kamehameha Highway at Laniakea Beach in August 2019. Frustrated by the conditions, the North Shore community held protests urging lawmakers and the State to make the area safe. In response, HDOT elevated pedestrian safety at this location to become the primary project purpose. Other objectives that were identified in early community engagement processes, including the Highway's protection from erosion, maintaining roadway reliability, and congestion-relief, are relevant criteria to identify appropriate solutions, but pedestrian safety is paramount.

1.1 Purpose of this Document

The proposed project requires environmental review in accordance with Hawaii Revised Statutes (HRS) Chapter 343 because it involves State funds, use of State and County lands, use of land classified as Conservation District, as well as use of shoreline areas. As an agency action, the State of Hawaii Department of Transportation, Highways Division is responsible for preparing this document which must comply with Hawaii Administrative Rules (HAR) Title 11, Chapter 200.1.

This Final EA discloses the foreseeable environmental impacts that could result from the project's implementation and commits to specific measures to avoid, minimize, or mitigate adverse impacts to the environment. Additionally, this Final EA contains a record of consultation activities that have been conducted as part of project planning for pedestrian safety. It does not detail all previous project planning that has occurred since HDOT began working on this issue in 2011.

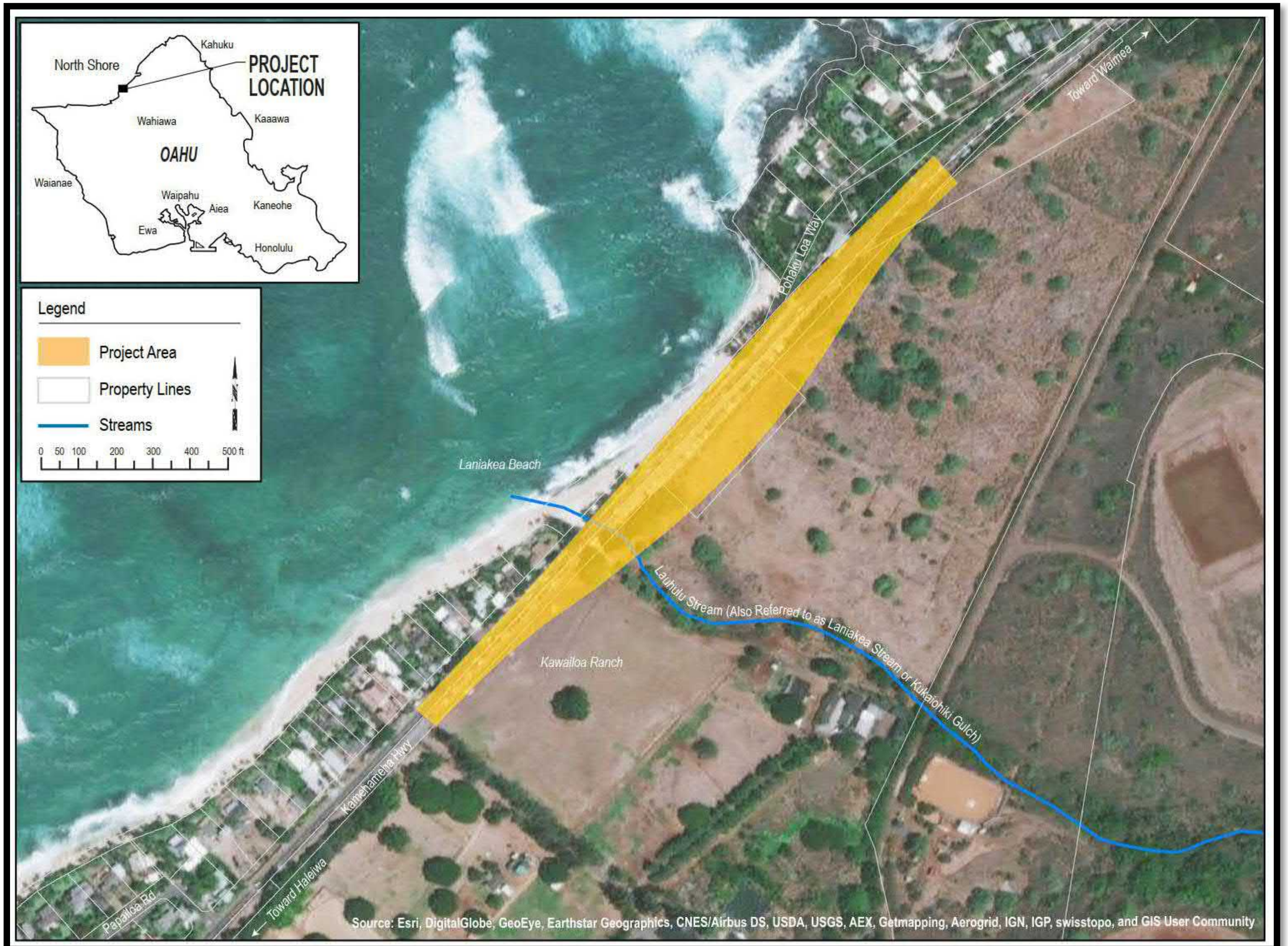


Figure 1-1. Project Location

However, information gained from meetings with resource agencies, City officials, community groups, adjacent residents, property owners, task force advisory meetings, and affected individuals were instrumental to guiding project development. Such information has been captured and incorporated into the design alternatives put forward for evaluation. When pertinent, references to these discussions are provided. The very brief history summarized in Section 1.4 provides just enough detail to understand the broader contexts that have guided project decision-making.

In consideration of the comments received on the Draft EA, and based on the Significance Criteria specified in HAR 11-200.1-13, HDOT has determined that the proposed project is not likely to have a "significant" impact in accordance with HRS Chapter 343 and HAR 11-200.13. Therefore, HDOT is issuing a "Finding of No Significant Impact" (FONSI) for the project, which is documented in Chapter 5 of this EA.

1.2 Organization of this Document

This Final EA is organized as follows:

- Chapter 1.0: Provides an introduction and discusses the purpose and need for the project.
- Chapter 2.0: Presents the project alternatives, including those previously considered but were eliminated, as well as the anticipated schedule and costs. It also lists permits and approvals that may be required.
- Chapter 3.0: Describes existing environmental conditions, potential environmental impacts, and the mitigation measures that are proposed to reduce the level of impact.
- Chapter 4.0: Documents agency and public coordination related to the proposed project.
- Chapter 5.0: Provides the FONSI statement pursuant to HRS Chapter 343.
- Chapter 6.0: Consists of a list of references used in the preparation of this Final EA.
- Appendices: Contains records of coordination conducted for the project, including Draft EA Comments and Responses (Appendix A-2), as well as the various technical reports prepared by specialists.

1.3 Naming Conventions in this Document

This document generally uses the directional terms north, south, east, and west. However, the terms "mauka" and "makai" (towards the mountains and towards the ocean, respectively), and "Haleiwa" and "Waimea" are also used, especially where these terms may be the most convenient to describe a direction or location. In this document, mauka generally corresponds to an easterly direction, makai is a northwesterly direction, while towards Haleiwa is a southwesterly direction and towards Waimea corresponds to a northeasterly direction.

1.4 Project History

Coastal erosion is a well-documented threat to various sections of Kamehameha Highway. While there are more recent studies that evaluate highway vulnerabilities to shoreline processes, HDOT's 2003 <u>Statewide Highway Shoreline Protection Study</u> was the initial study to identify two sections along Kamehameha Highway as being undermined by ocean currents. Photos from 2000, and maps dating as far back as 1949 show the Highway's exposure to the ocean at Laniakea Beach with narrow, eroding roadway shoulders as well as near Chun's Reef. At Laniakea, overtopping waves and storm water run-off had been undercutting the boulder escarpment and beginning to undermine the Highway.

In 2005 the City and County of Honolulu (City) had planned to develop two beach parks, the "Laniakea Beach Support Park" near Laniakea Beach and "Kawailoa Beach Park" near Chun's Reef (see Section 3.2). The EAs for these two beach park projects (City, 2005a and b) suggested coordination with the State Department of Transportation (HDOT) for moving the Highway inland.

In 2007 Department of Land and Natural Resources (DNLR) Office of Conservation of Coastal Lands (OCCL) wrote a memorandum titled "OMPO Transportation Enhancement Program Kamehameha Highway Relocation Review and Summary Laniakea Beach, Kawailoa, Waialua District Oahu" supporting an effort to relocate the Highway mauka because such a project could address several problems, including chronic erosion, flooding, and storm surge.

In 2012 HDOT held public meetings and developed a Task Force to:

- Identify sources of issues experienced along Kamehameha Highway at both Laniakea Beach and Chun's Reef, and
- Involve the community in creating community-accepted solutions.

The proposed project was to be paid for with federal funds designated to prevent erosion and keep the Highway operational. Many options were discussed and considered, including a seawall type revetment, inland alignments at varying distances from the shoreline, and an option that included beach parking.

During public meeting and task force discussions, the community vocalized their frustration with the traffic congestion created by people parking on the mauka side of the Highway and crossing to see the sea turtles on the beach. Meeting attendees advised that a low cost, immediate solution of blocking parking along the Highway at Laniakea Beach could be implemented without affecting the traditional cultural resources on the adjacent properties. Equally important was that the community wanted immediate relief. With this input, HDOT developed a pilot program that would test three scenarios for barrier placement: No Parking, Parking on City Property where left turns onto Kamehameha Highway are prohibited, and Parking on City Property where left turns onto Kamehameha Highway are allowed. At the time, the City could not license or allow for the latter scenarios leaving only the No Parking scenario to evaluate.

In December 2013, HDOT installed a 1,000-foot concrete barrier to prevent parking on the mauka side of the Highway. While the barrier is reported to have lessened traffic congestion (see Traffic Evaluation in Appendix B), it was installed as a temporary demonstration project. After a lawsuit filed by a group called Save Laniakea Beach and five individuals, the *Save Laniakea Beach* decision of July 8, 2015 by the State of Hawaii's First Circuit Court mandated HDOT remove the barrier installation.

HDOT removed the barriers on August 24, 2015, storing them on City property just mauka of and parallel to the Highway. Additionally, the *Save Laniakea Beach* decision mandated that re-installation could not occur until all requirements of the law had been complied with. The underlying assumption being that a Special Management Area (SMA) was required and had not been obtained.

In 2016 HDOT began working on a new EA to support a Special Management Area (SMA) permit allowing the barriers to be reinstalled. Early scoping efforts in the SMA permit process yielded a previously certified shoreline map. HDOT was also informed that the barrier project was likely within the Conservation District instead of the SMA. To determine whether the project is in the Conservation District or the SMA, a Shoreline Certification application was required to be submitted to Hawaii Department of Land and Natural Resources (DLNR).

On May 10, 2017, HDOT submitted a Shoreline Certification application to DLNR. A community member filed a Notice to Appeal on July 30, 2017. The shoreline certification request was ultimately denied on July 5, 2018, based on the appeal's assertion that the earlier barrier installation on City property was considered an unauthorized improvement.

HDOT submitted a second Shoreline Certification application with the Right of Entry Agreement with the City attached as proof of the City's authorization for HDOT to have the barriers on City property. DLNR denied this application in the July 23, 2019 issue of The Environmental Notice because the Right of Entry Agreement was deemed insufficient to prove that the City had approved the installation of the traffic barriers.

While addressing the short-term barrier issues, the project continued to work on the primary purpose of the project or long-term solutions that address the Highway's vulnerability to shoreline erosion at both Laniakea Beach and Chun's Reef. The task force was not officially disbanded, but HDOT deemed that the group had achieved its objective and stopped meeting with the advisory group after April 2014. Project development efforts were focused on meeting with adjacent residents and landowners that would be directly impacted by the alternatives, as well as meeting with resource and regulatory agencies with jurisdiction to refine alternatives initially developed in task force meetings.

On August 1, 2019, a child was struck by a car and badly injured as he ran across Kamehameha Highway. The accident and community protests prompted HDOT to re-prioritize the project's purpose and need to focus on pedestrian safety, as described in Section 1.5. A change in the project's purpose meant that the range of viable alternatives would shift (See Section 2.5). State funds were then allocated for the project's construction in lieu of the 80% federal fund allotment.

In preparation to submit a third Shoreline Certification to construct the project, HDOT removed the barriers from the location completely in September 2019 so that they do not obstruct the highest naturally occurring inland wash of the waves.

HDOT submitted a new Shoreline Certification Application on January 14, 2020, and DLNR certified the shoreline on July 30, 2020. While the barriers were in the Conservation District, the proposed project is confirmed to be mauka of the shoreline and in the SMA, therefore, an SMA Use Permit and Shoreline Setback Variance will be required for this project.

One conclusion of the *Save Laniakea Beach* decision is that nothing in the order precluded the parties involved from seeking a mutually agreeable barrier installation. On July 9, 2020, Civil Beat reported that an interim solution for how to fix the traffic, access and safety issues along the Laniakea corridor was reached in a court settlement on June 17, 2020. This interim solution is considered in this EA as a potential baseline condition and referenced as the No Build Settlement Alternative (See Section 2.2). As this Final EA goes to publication, the No Build Settlement Alternative has been implemented.

1.5 Project Purpose and Need

The project is located on the North Shore of Oahu. The site is roughly 2.3 miles from Haleiwa at approximately milepost 3.3. Kamehameha Highway (State Route 83) is a two-lane rural highway functionally classified by HDOT as a “Principal Arterial” because it is the principal roadway used for mobility between surrounding urban areas. Although principal arterials typically have limited access, there are a number of local roads, and residential driveways along the Highway within the project area.

The project area is rural in character but is visited more than a typical rural area due to the scenic beauty of the region, natural resource attractions (e.g., turtles and whales), beaches, and surf. While the North Shore, in general, is an attraction, the sea turtles that rest on Laniakea Beach also draw many visitors. The North Shore Sustainable Communities Plan (NSSCP) estimates that in 2005, the North Shore experienced an average of 7,000 visitors per day, for comparison, this was about 40% of the total number of residents on the North Shore at the time (NSSCP, 2011). Such a visitor trend has created significant pressure on the North Shore Community’s resources and infrastructure, including Kamehameha Highway at Laniakea Beach.

The primary purpose of this project is to improve safety for pedestrians and all modes of transportation at the section of Kamehameha Highway fronting Laniakea Beach.

Secondary to pedestrian safety, the project is being proposed to:

- <u>Improve Reliability</u>. Reduce the Highway’s vulnerability to climate change, wave inundation, and coastal erosion that threatens its ability to operate,
- <u>Relieve Congestion</u>. Relieve congestion by reducing travel times throughout the project area, and
- <u>Pedestrian and Bicycle Facilities</u>. Support alternative transportation modes as identified in regional community and transportation plans.

The remainder of this section describes the need associated with each project purpose.

<u>1.5.1 Improve Safety</u>

The primary purpose of this project is to improve safety for both pedestrians and motorists utilizing Kamehameha Highway fronting Laniakea Beach. During the peak hours, approximately 50 to 70 cars park on the mauka side of the Highway. There are no sidewalks and no crosswalks along this section of Kamehameha Highway, yet 200 to 300 hundred pedestrians cross the Highway each hour from about 11:00am to 4:00pm to get to the beach from their vehicles (See Appendix B).

The lack of an established circulation pattern for pedestrians creates conditions where beachgoers cross the Highway at haphazard locations without the benefit of a crosswalk. Crossing the busy road is especially challenging for the disabled, people carrying beach gear, and small children. During free-flowing traffic, pedestrians have darted across the road. Narrow roadway shoulders on the makai side of the Highway also leave pedestrians vulnerable to oncoming traffic as they walk along the road, waiting for the opportunity to cross back to their vehicle.

The safety environment is further complicated by the large volumes of people who are not familiar with the area, attempting vehicle maneuvers in the shoulder to re-orient themselves back to Waimea or towards Haleiwa. Such maneuvers, when attempted in congested areas, interfere with both pedestrian safety and the safety of other vehicles.

Lastly, as a scenic area, drivers are often distracted in this short stretch of Highway because it is the first opportunity to check the surf and ocean conditions as vehicles head toward Waimea. Sometimes this just results in a slowdown of traffic, other times, it creates near misses for vehicle-vehicle and vehicle-pedestrian accidents. Drivers, frustrated by the slowed conditions, have been observed using the roadway shoulder or driving in the on-coming traffic lane to push past the bottleneck.

Improvements are needed to address the conflicts between Kamehameha Highway and beach access.

1.5.2 Improve Reliability

A secondary purpose of the project is to reduce the Highway's vulnerability to climate change, including sea level rise, coastal erosion and inundation, thereby improving the roadway's reliability for service.

As the main public thoroughfare and an evacuation route, Kamehameha Highway's service or ability to operate must be reliable. Especially, when considering vehicle response times during emergencies and disasters, as well as supporting evacuation of the area in the event of tsunami, flooding, or hurricane, etc. At Laniakea Beach, both long-term and short-term or seasonal shoreline processes threaten Highway operations. During high surf and flooding this section of the Highway has been closed because it is rendered too hazardous to travel (April 2011, NSSCP). See Figure 1-2.

In 2003, HDOT published the Statewide Highway Shoreline Protection Study, which identified two sections of Kawailoa Beach, a 700-foot section and a 200-foot section of Kamehameha Highway, fronting Laniakea Beach and Chun's Reef, respectively, that are directly exposed to the ocean and have imminent or actual highway damage due to wave attack. At these locations, the Highway is protected by a boulder escarpment; however, overtopping waves and stormwater run-off are undercutting this protection and undermining the Highway.

More recently The National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands (2012) and the Integrated Ocean Observing System also document erosion on Hawaii's shoreline. These interactive mapping tools allow sea level and shoreline data to be shown for Laniakea beach and are discussed in more detail in Section 3.11.

Sea level has been projected to rise globally approximately 1-foot by mid-century and 3 feet by the end of the century (Intergovernmental Panel on Climate Change [IPCC], 2014). The Hawaii Sea Level Rise Viewer (HSLRV) similarly identifies 3.2 feet sea level rise by the end of the century (Tetra Tech, Inc. and UH Coastal Geology Group, 2017). More conservatively, the City and County of Honolulu has assumed a 3.2-foot sea level rise by mid-century and a 6-foot rise by the end of the century as its “planning benchmarks” (City Office of the Mayor, 2018; City Climate Change Commission, 2018).

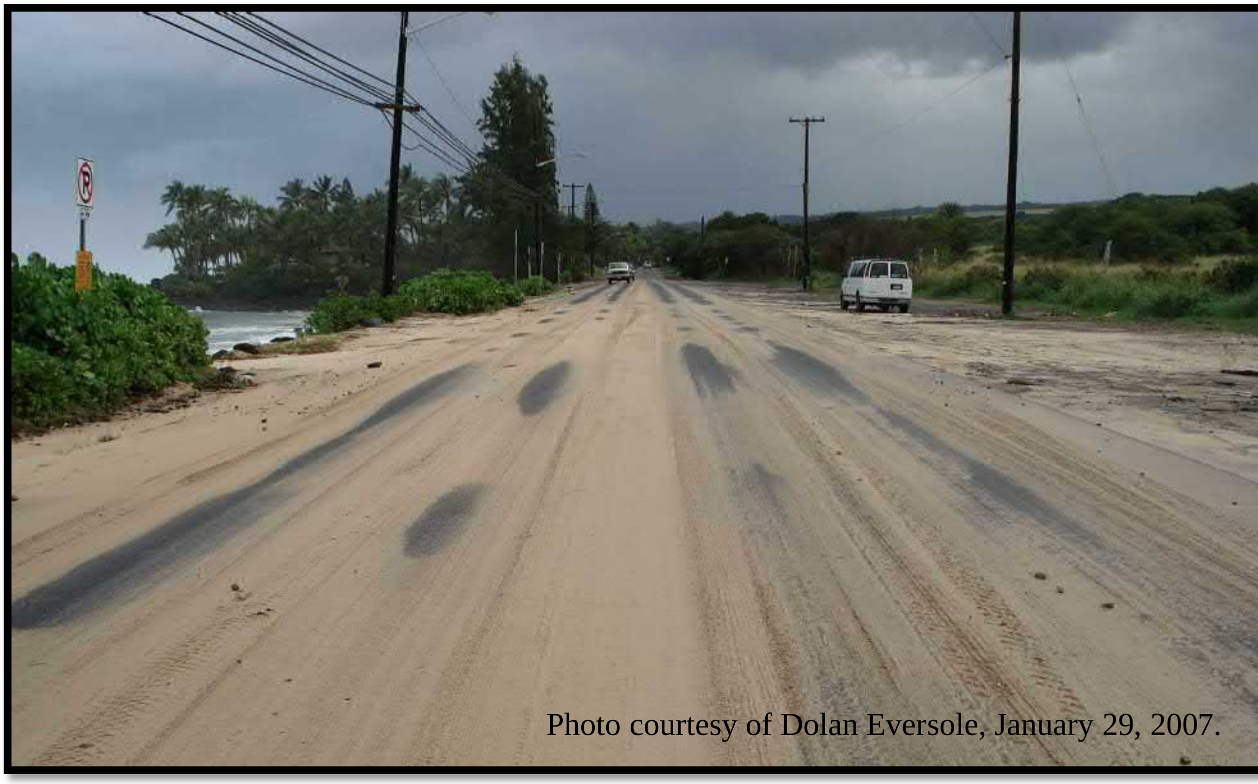


Photo courtesy of Dolan Eversole, January 29, 2007.

Figure 1-2. Photograph of Sand Deposition from Waves Overtopping Kamehameha Highway at Laniakea Beach

Figure 1-3 provides a map of the project area with the 3.2-foot sea level rise shown, as well as projections for coastal erosion from the HSLRV model. The model predicts that Kamehameha Highway within the project limits would be inundated by the ocean with a 3.2-foot sea level rise. Additionally, although not shown on the figure, the model predicts that just a 0.5-foot sea level rise would be enough to flood the Highway immediately adjacent to Laniakea Beach (Tetra Tech, Inc. and UH Coastal Geology Group, 2017).

In addition to sea level rise, the predicted climate changes may bring more frequent severe weather events, which could result in more frequent hurricanes, high surf, and flooding.

This project is needed to address the Highway’s vulnerability to these short and long-term processes that threaten the road’s ability to operate presently and in the future.

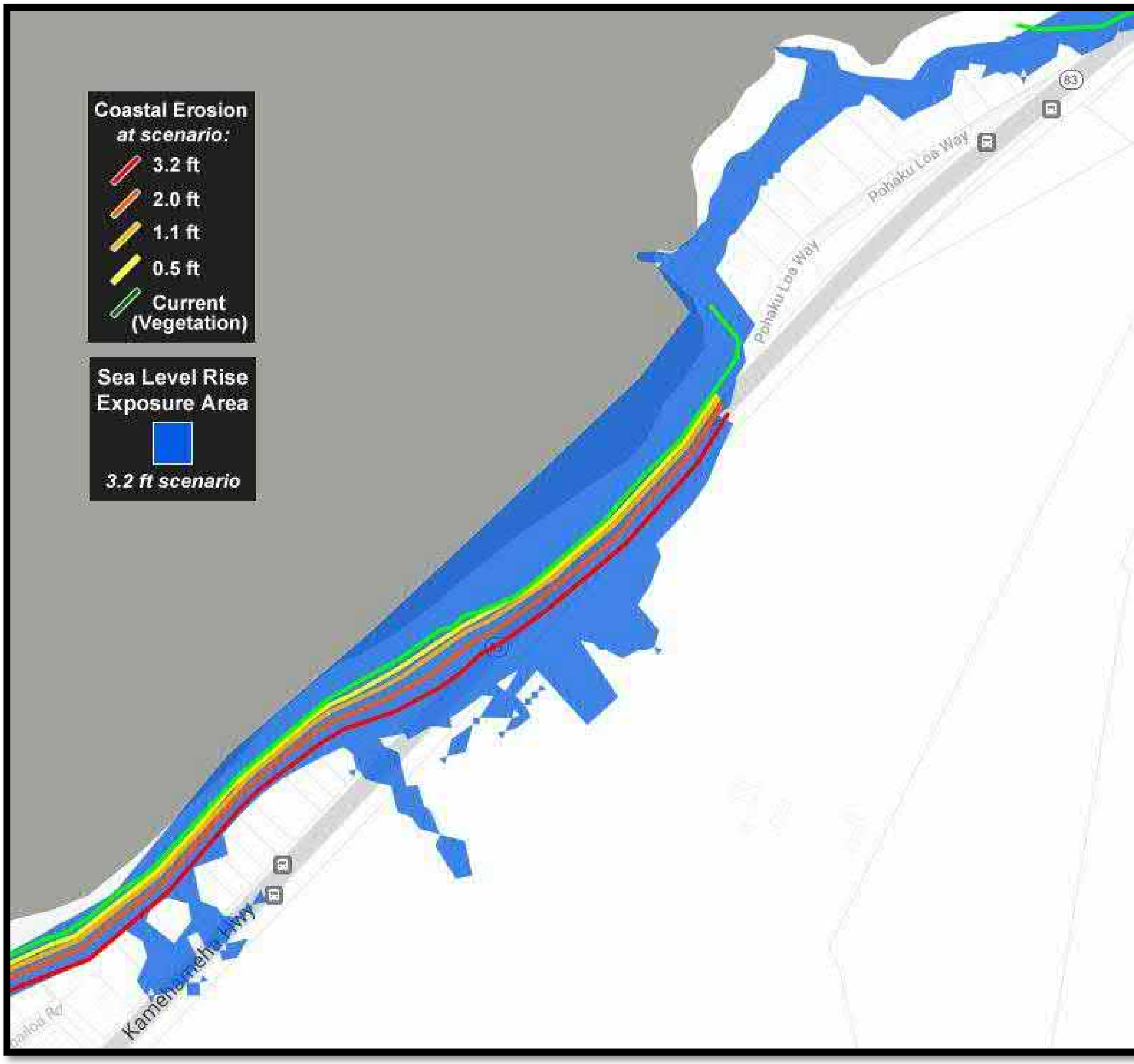


Figure 1-3. Sea Level Rise Exposure Area and Shoreline Coastal Erosion Scenarios

1.5.3 Relieve Congestion

Relieving vehicle congestion in the project area is another secondary project purpose. Traffic delays experienced along Kamehameha Highway are caused by the pedestrian-vehicle conflicts associated with beach access. Traffic demand is not being processed as pedestrians cross or slow traffic by walking alongside the road at Laniakea Beach, as described in Section 1.5.1. Weekend and weekday delays are typically 30 minutes, with vehicles stacked up beyond the Joseph P. Leong Highway intersection (Haleiwa Bypass) and beyond the Kamehameha Highway intersection with Pupukea Road on the Waimea Bay side of the project area. Once beyond the Laniakea Beach area, congestion decreases significantly. See Appendix B for the Traffic Evaluation.

The project is needed to reduce or remove conflicts between beach access and the Highway, which is a source for congestion along this stretch of Kamehameha Highway.

1.5.4 Provide Pedestrian and Bicycle Facilities

As indicated by the North Shore Sustainable Communities Plan (NSSCP, 2011), the community does not favor increasing the Highway's capacity to accommodate more cars but supports the promotion of alternative modes of transportation. Currently there are no pedestrian and bicycle facilities within the project limits. Pedestrians and cyclists utilize the roadway shoulders or are forced to the margins of the right-of-way and adjacent properties.

HDOT's master plan for bicycle facilities, Bike Plan Hawaii (HDOT, 2003a), provides a long-term strategy for the State's bicycle improvements. Bike Plan Hawaii identifies two bike facilities in the project area (see Figure 1-4 below):

- Project 55, a priority 1 (highest priority) project to extent the Ke Ala – Pupukea Path from Three Tables to roughly Kawailoa Drive (roughly 3.5 miles). A bike path is generally a 10-foot -wide paved path with at least a 5-foot separation from any roadway.
- Project 54, a priority 3 (lowest priority) project to make Kamehameha Highway a signed shared road from roughly Haleiwa Road to Pupukea Road (roughly 3.9 miles). A signed shared road generally consists of sufficiently wide paved shoulders or wider travel lanes with signs.

Multi-modal facilities provided by this project would need to have the potential for future regional connectivity.

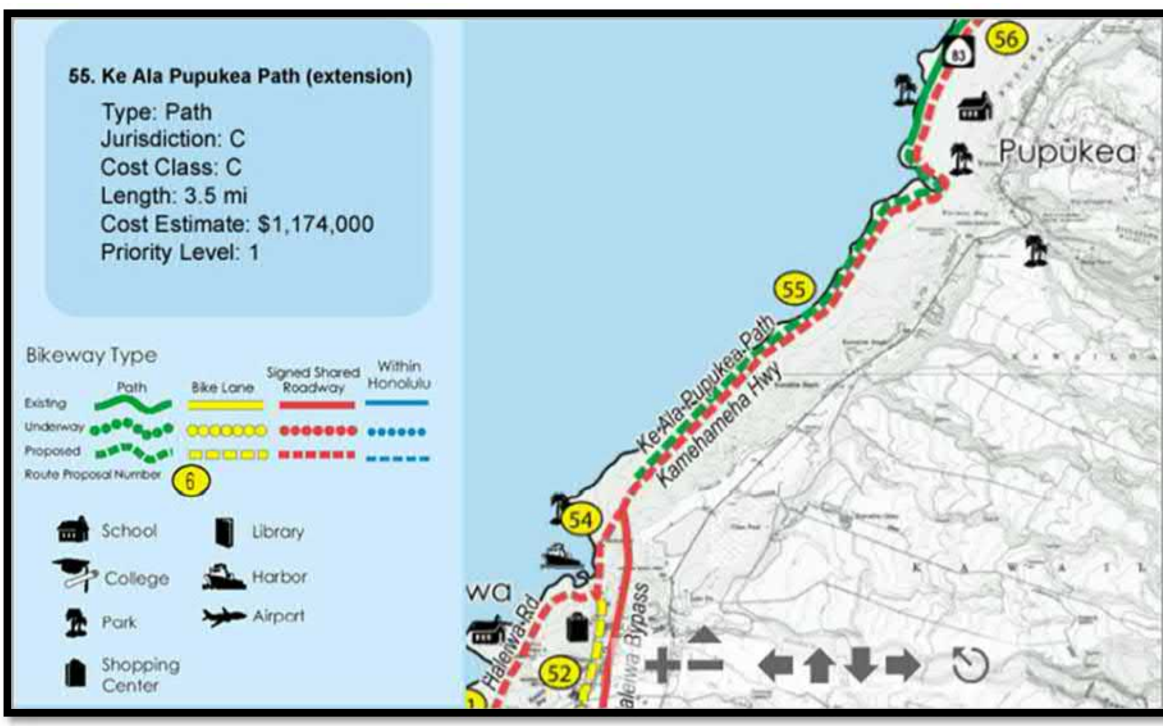


Figure 1-4. Existing and Proposed Bike Paths in Bike Plan Hawaii (2003)

2.0 PROPOSED PROJECT ALTERNATIVES

Four conditions are analyzed in this EA: The No Build, the No Build Settlement, Transportation System Management (TSM), and the Pedestrian Shift Alternatives.

The No Build and No Build Settlement Alternatives serve as two separate baselines for comparison against the TSM and the Pedestrian Shift Alternatives.

2.1 No Build Alternative

The No Build Alternative is the existing condition or "do nothing" approach. It would leave the project area as it is with no changes to the transportation infrastructure. As this EA was being finalized, the No Build Settlement Alternative (see Section 2.2) was actively being implemented. The No Build Settlement Alternative is required to stay in place for one year and there is no date or requirement for its removal. Therefore, both the No Build Settlement Alternative and the No Build Alternative are included as alternate baseline conditions.

The No Build Alternative assumes that projects listed on the Statewide Transportation Improvement Program (STIP) and included in the Oahu Regional Transportation Plan 2040 (2016) (ORTP) would be built by 2040, with the exception of the proposed project (Figure 2-1).

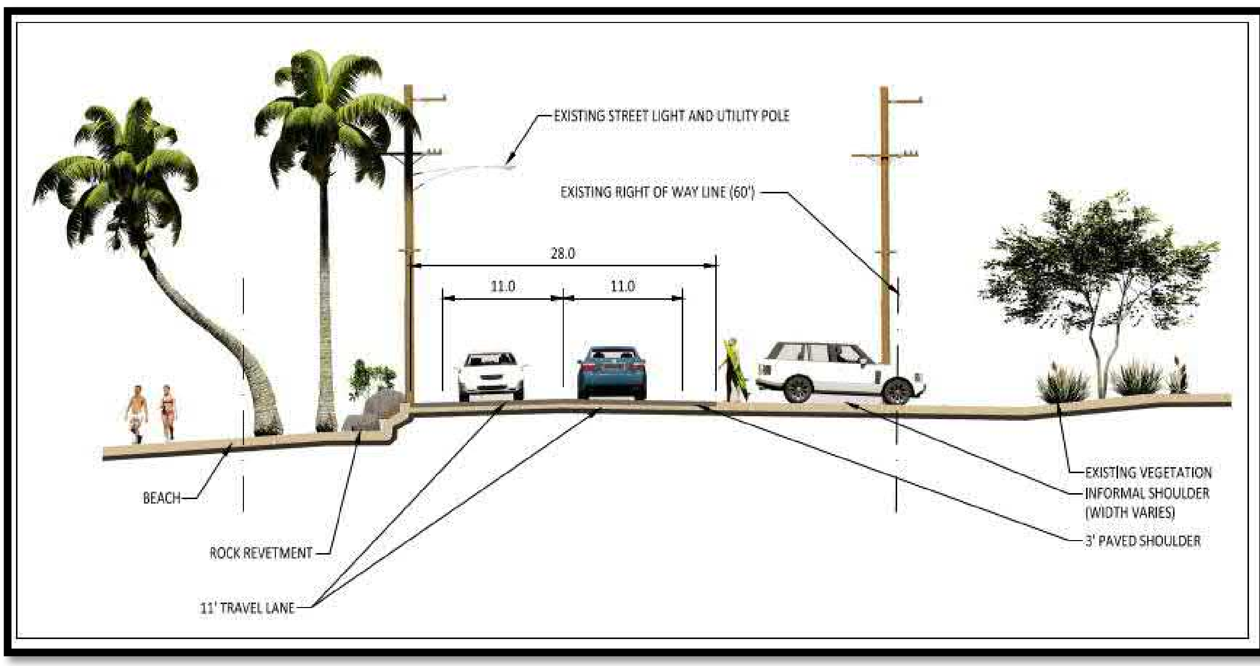


Figure 2-1. No Build Alternative / Existing Typical Section

There are no other projects listed on the STIP in the ORTP 2040 that are specific to the Project area. ORTP 2040 project number 10, titled "Kamehameha Highway, Safety Improvements, Haleiwa to Kahaluu" is indicated to include "Construct safety improvements along Kamehameha Highway from Haleiwa to Kahaluu. Improvements include turn lanes, guardrails, signage, crosswalks, etc. to improve safety. Widening of Kamehameha Highway will be only in areas where needed for storage/turn lanes safety improvements." Although turn lanes could be added in the project area under ORTP 2040 project number 10, this is unlikely because there are no major intersections within the project area.

With this Alternative, it is assumed that shoreline erosion mitigation would be undertaken on an as needed basis, as it is today. This typically involves (a) closing the highway during periods of high surf when the highway is overtopped by waves, (b) the removal of sand and debris from the highway surface following high wave events, and (c) periodic maintenance of the rocks protecting the highway embankment along the shoreline. These activities would be performed within the existing highway ROW to the degree practicable.

In the event the Highway was to suffer greater damage, more invasive emergency repair projects may be necessary. Such emergency projects have occurred elsewhere in Hawaii, including, for example, Kamehameha Highway repair at Kaaawa on Oahu and Honoapiilani Highway shoreline repairs on Maui, which both resulted in the installation of shoreline revetments. Some may find these emergency projects preferable to improvement projects due to their speed and perceived short-term improvements. However, such emergency projects have noteworthy shortcomings, including: (a) only the same facilities can be rebuilt, no enhancements can be made; (b) the repairs do not address the underlying cause of the emergency and the facility remains under threat of a repeat event; (c) adverse short-term impacts may occur, both to the travelling public and the natural environment; and (d) unintended adverse long-term impacts may also occur to the natural environment, such as beach loss when shoreline revetments are installed.

Other development in the project area would occur under the No Build Alternative. The scope of all public and private development in the project area between now and 2030 is unknown; however, some projects have been planned or proposed, including the following:

- Papailoa residential infill project, by Kamehameha Schools
- Kapaeloa residential infill project, by Kamehameha Schools
- Kuikuiloloa Ag Area project, by Kamehameha Schools

Kamehameha Schools / Bishop Estate is not actively pursuing any of these projects and will seek community input before any future development is considered.

At this time, the City DPR has no plans to implement the development of Laniakea and Kawailoa Beach Parks as described in Section 3.2.

2.2 No Build Settlement Alternative

As this EA was being finalized, the No Build Settlement Alternative was actively being implemented. It is included as an alternate baseline condition with the No Build Alternative. The No Build Settlement Alternative can be considered an interim measure because it may provide limited relief in addressing pedestrian safety and traffic congestion. Ultimately, it does not change the ability to implement the preferred alternative, which satisfies all the needs identified in Section 1.5 of this EA.

The No Build Settlement Alternative was constructed by the City DPR with input from HDOT. It involves allowing cars to park on the mauka side of the Highway on an unpaved parking area for better public access to Laniakea Beach and installing barricades and crosswalks so that visitors might cross the Highway in a safer, more orderly fashion.

Cars enter the parking area by making a right-turn from Kamehameha Highway on the Haleiwa side. Cars exit the parking area by making a right-turn onto Kamehameha Highway at the Waimea end. Cars travelling on Kamehameha Highway in the Haleiwa-bound direction are prohibited from making left-turns into the parking area. Additionally, cars exiting the parking area are prohibited from making a left turn towards Haleiwa.

To accomplish this, the City DPR moved a cattle fence on its property mauka of the Highway so that cars have room to maneuver and park. SMA Permit Minor No. 2020/SMA-38 and Minor Shoreline Structure Permit No. 2020/MSS-4 were issued by DPP on December 7, 2020 to allow fencing within the City properties TMK 6-1-005:024, 6-1-009:024, and 6-1-010:019.

An estimated 50-60 parking spaces are available in the unpaved open grassland. Large tour buses and vans that often shuttle tourists to Laniakea are prohibited from stopping there. The No Build Settlement Alternative was fully implemented in November 2021. The agreement calls for a one-year trial period.

Figure 2-2 provides a typical section and Figure 2-3 illustrates a plan view. Illustrations presented in this EA should be considered an artistic rendition to facilitate an understanding of the scenario and not considered as-built drawings. The simplicity of the Alternative allows for sufficient analysis to satisfy the intent of HRS Chapter 343.

Like the No Build Alternative, the No Build Settlement Alternative includes the assumption that HDOT will conduct shoreline erosion mitigation on an as needed basis, as it is described in the No Build Alternative. Other development in the project area by agencies or entities other than HDOT would continue under the No Build Settlement Alternative similar to the No Build Alternative.

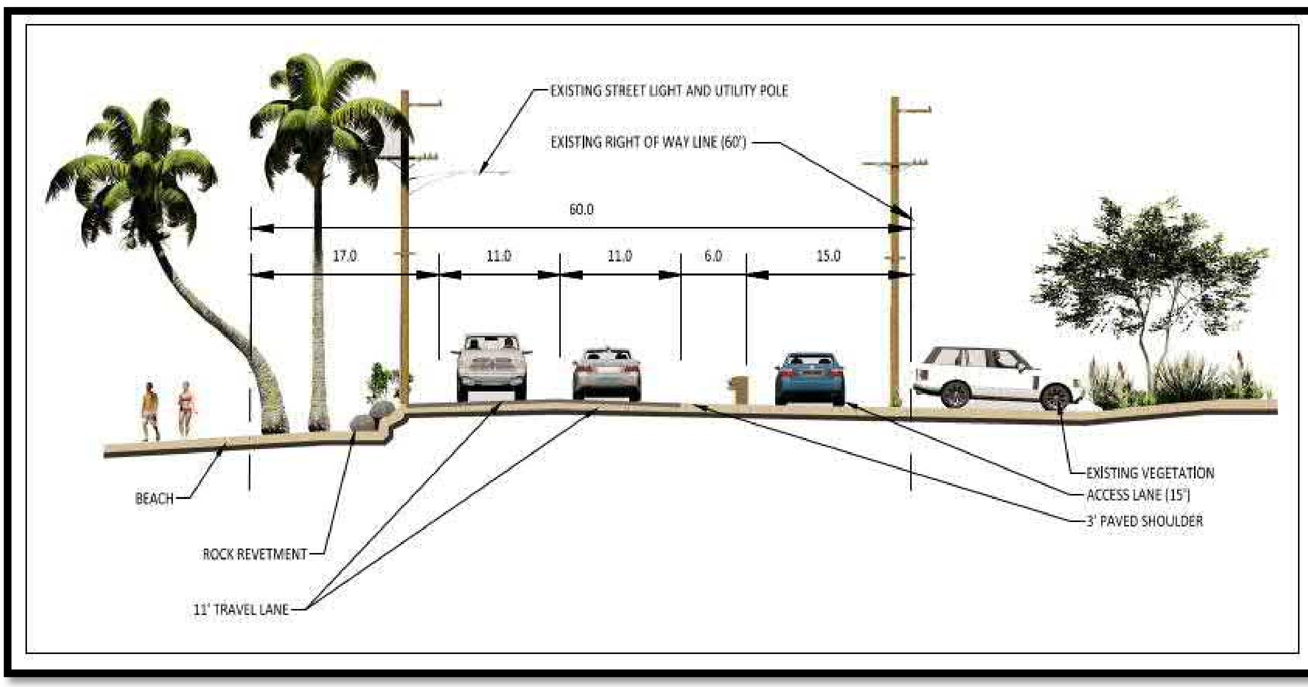


Figure 2-2. No Build Settlement Typical Section

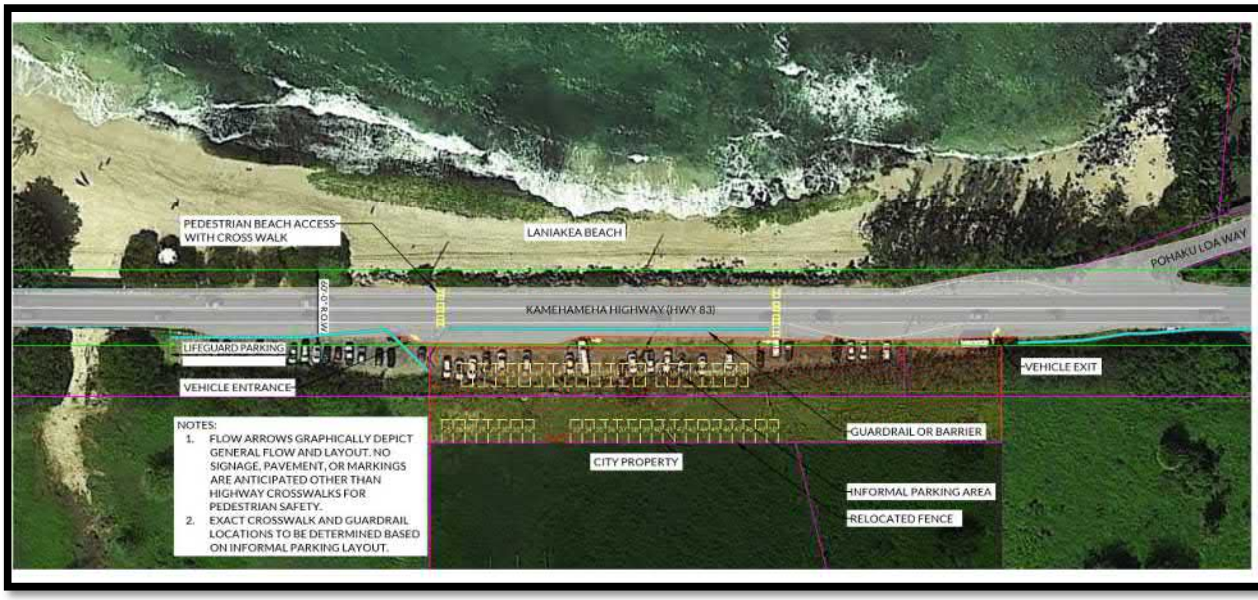


Figure 2-3. No Build Settlement Alternative Plan View

2.3 Transportation System Management (TSM) Alternative

The Transportation System Management Alternative (TSM) would entail blocking off the mauka side parking with a permanent guardrail. The guardrail would be in a similar location as the concrete barriers that were installed in 2013. See Figure 2-4 below. Parking would be unavailable on the mauka side of the road, and no crosswalks would be established.

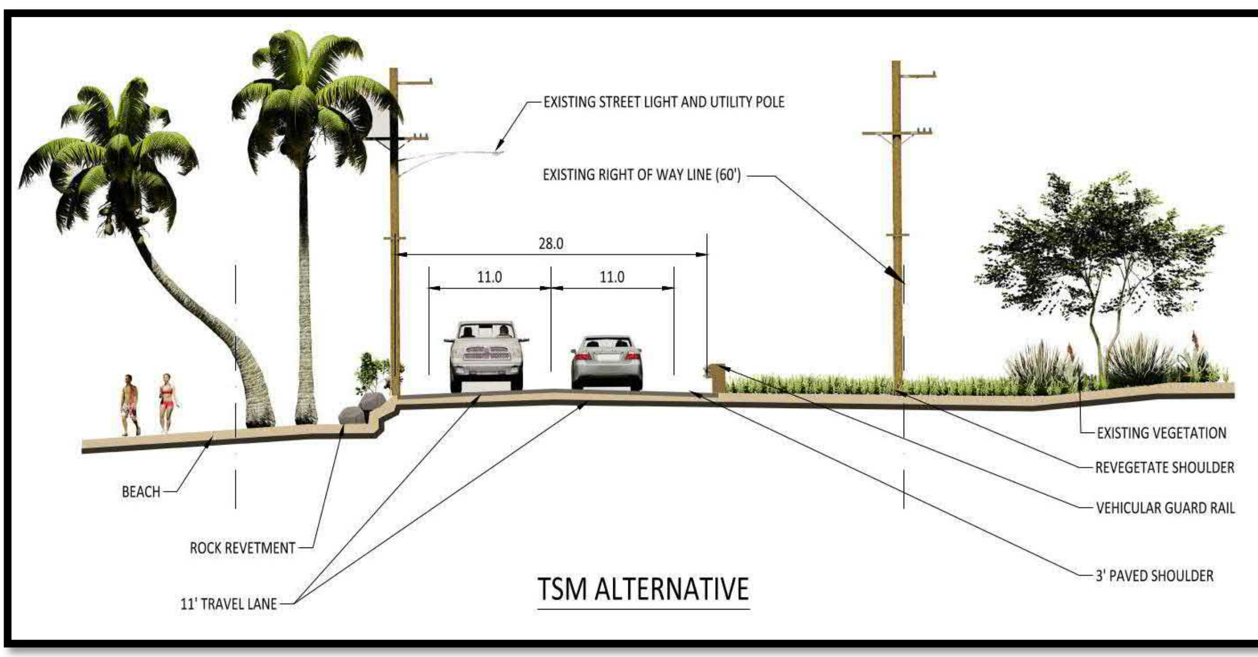


Figure 2-4. TSM Project Alternative Typical Section

In addition, the TSM Alternative includes shoreline erosion mitigation on an as needed basis as it is described in the No Build Alternative. Other development in the project area by agencies or entities other than HDOT would continue under the TSM Alternative.

Figure 2-5. TSM Project Alternative Plan View

2.4 Pedestrian Shift Alternative

The Pedestrian Shift Alternative is the preferred alternative and is referred to in this document as the proposed project. It generally consists of realigning Kamehameha Highway mauka up to 80 feet from its current location from the Haleiwa side of Lauhulu Stream bridge for roughly 1,100 feet. A typical section of the realigned highway is provided in Figure 2-6 and a plan view is shown in Figure 2-7. Components and details of this Alternative include:

- A highway right-of-way that is generally 120-feet wide with two 12-foot wide through lanes (one in each direction) and a 10-foot wide median refuge lane for part of the realigned distance;
- A normal asphalt road structure with provisions on the makai edge of the highway, a buried concrete cut-off wall, to reduce the potential of soil erosion from under the roadway where needed;
- Vehicular guardrails to prevent parking on the mauka side of the shifted highway. Placement of guardrails on the makai side of the shifted highway will be evaluated during final design to allow for streamlining of vehicles;
- Existing cross streets and driveways will be modified to allow access to the realigned Kamehameha Highway with a vehicle control gate at Pohaku Loa Way;
- Streetlights will be installed on the mauka side of the highway;
- Drainage improvements;
- A new bridge at Lauhulu Stream on the mauka side of the existing Lauhulu Stream Bridge; and

- Re-purposing the highway by converting the mauka lane of the existing Kamehameha Highway to a 16-foot wide shared use path for bicycles and pedestrians. The makai lane will be partially removed and naturalized.

This Alternative is based on the previously developed “Minor” Alternative without a large coastal revetment and the “Quinlan” Alternative without parking and tight curves (Section 2.5.3). Because the road is shifted, there will be no open area for parking on the mauka side and the temptation to park and cross the road to access the beach will be removed. However, the makai side of the realigned Highway may accommodate parking with an estimated capacity of 90 cars in the 60-foot-wide by 400-foot-long space if the area were eventually paved and striped with parking stalls. With informal or non-designated parking, the number of cars anticipated to use the area would be similar to the No Build Settlement condition.

HDOT intends to retain ownership of both the existing Kamehameha Highway right-of-way, as well as the realigned area. A maintenance plan will be developed for the naturalized areas.

Public access to City DPR’s parking area will be available during construction as coordinated around the Contractor’s work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible throughout the duration of construction.

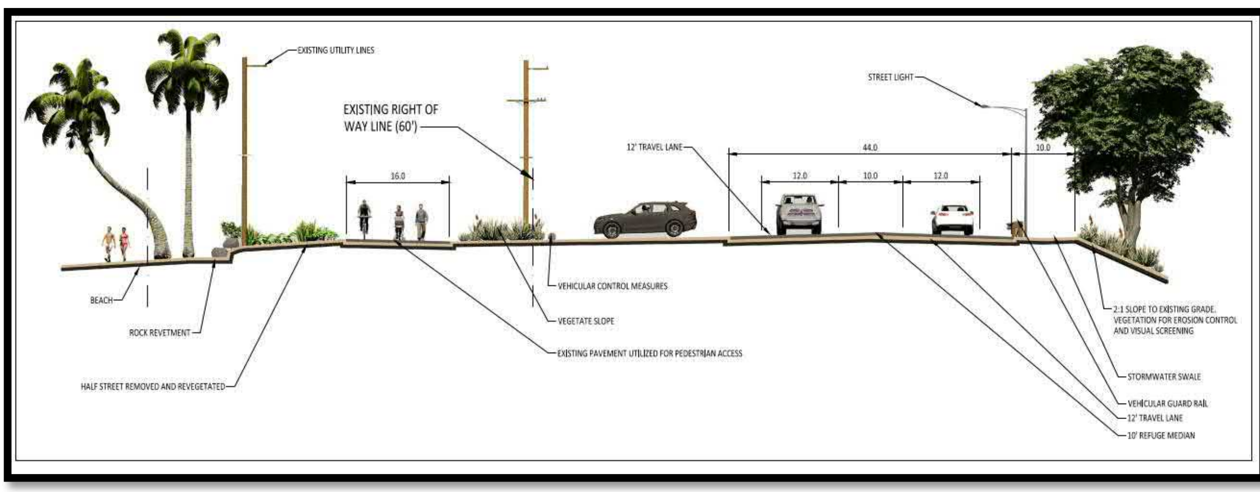


Figure 2-6. Pedestrian Shift Alternative Alignment Typical Section

Figure 2-7. Pedestrian Shift Alternative Plan View

2.5 Other Alternatives Considered but Eliminated

Eleven (11) realignment alternatives were considered in addition to the Pedestrian Shift Alternative. Many of these alternatives are variations of a principal or distinct alignment. Principal alignments that are described in greater detail in subsequent sections are shown in ***bold italics***. Some of these principal alternatives are shown in Figure 2-8.

Realignment alternatives that were considered include:

- Alternative 1: Use Cane Haul Road
- Alternative 2: Use Cane Haul Road with tighter corners with more super elevation – this option became the ***Most Realignment Alternative***;
- Alternative 3: Move existing Kamehameha Highway 250’ mauka and connect to Frontage Road (allows for extension further in the Waimea direction);
- Alternative 4: Move existing Kamehameha Highway 250’ mauka but use the existing Chun’s Reef Bridge;
- Alternative 5: ***Minor Realignment*** (slighter shift mauka than previous alternatives with revetment fronting Laniakea Beach);
- Alternative 6: ***Moderate Realignment*** (similar to Alternatives 3 and 4 but different Waimea terminus);
- Alternative 7: New Realignment (alignment running parallel between Moderate and Most);
- Alternative 8: ***Waimea Extension*** (allows for Moderate, Most, or New Alignment Alternatives to meet up with the existing Kamehameha Highway at a point closer to Waimea);
- Alternative 9: ***Quinlan Realignment*** (Quinlan’s proposed relocation of Kamehameha Highway to occur mauka of the future Laniakea Beach Support Park.);
- Alternative 10: Modified ***Quinlan Realignment*** (adjusts the Quinlan Realignment to meet design standards for roadway geometry, resulting in an alignment similar to Alternatives 3 and 4 with a different Waimea terminus);
- Alternative 11: Modified ***Most Realignment*** (refines Alternative 2 based on input from Kamehameha Schools to shift the realignment curve as far Makai as possible to avoid cultural sites previously unidentified).

In addition to these eleven alternatives for realignment, three (3) connector route alternatives were developed.

Any alternative for consideration had to be designed to comply with the following standards to the extent possible and applicable:

- Americans with Disabilities Act (ADA)
- American Association of State Highway Transportation Officials’ (AASHTO’s) <u>A Policy on Geometric Design of Highways and Streets</u>
- AASHTO’s <u>Guide for the Development of Bicycle Facilities</u>

- AASHTO's LRFD [Load and Resistance Factor Design] Bridge Design Specifications
- AASHTO's Roadside Design Guide
- FHWA's Manual on Uniform Traffic Control Devices (MUTCD)
- HDOT's Design Criteria for Bridges and Structures
- HDOT's Design Criteria for Highway Drainage
- HDOT's Hawaii Statewide Uniform Design Manual for Streets and Highways
- HDOT's Stormwater Permanent Best Management Practices Manual

Each alternative was evaluated on its ability to meet the project purpose and need (See Section 1.5), meet engineering standards, and for their potential to cause significant negative impacts on the natural and human environment. These alternatives were removed from consideration at various times during the review process and are discussed below.

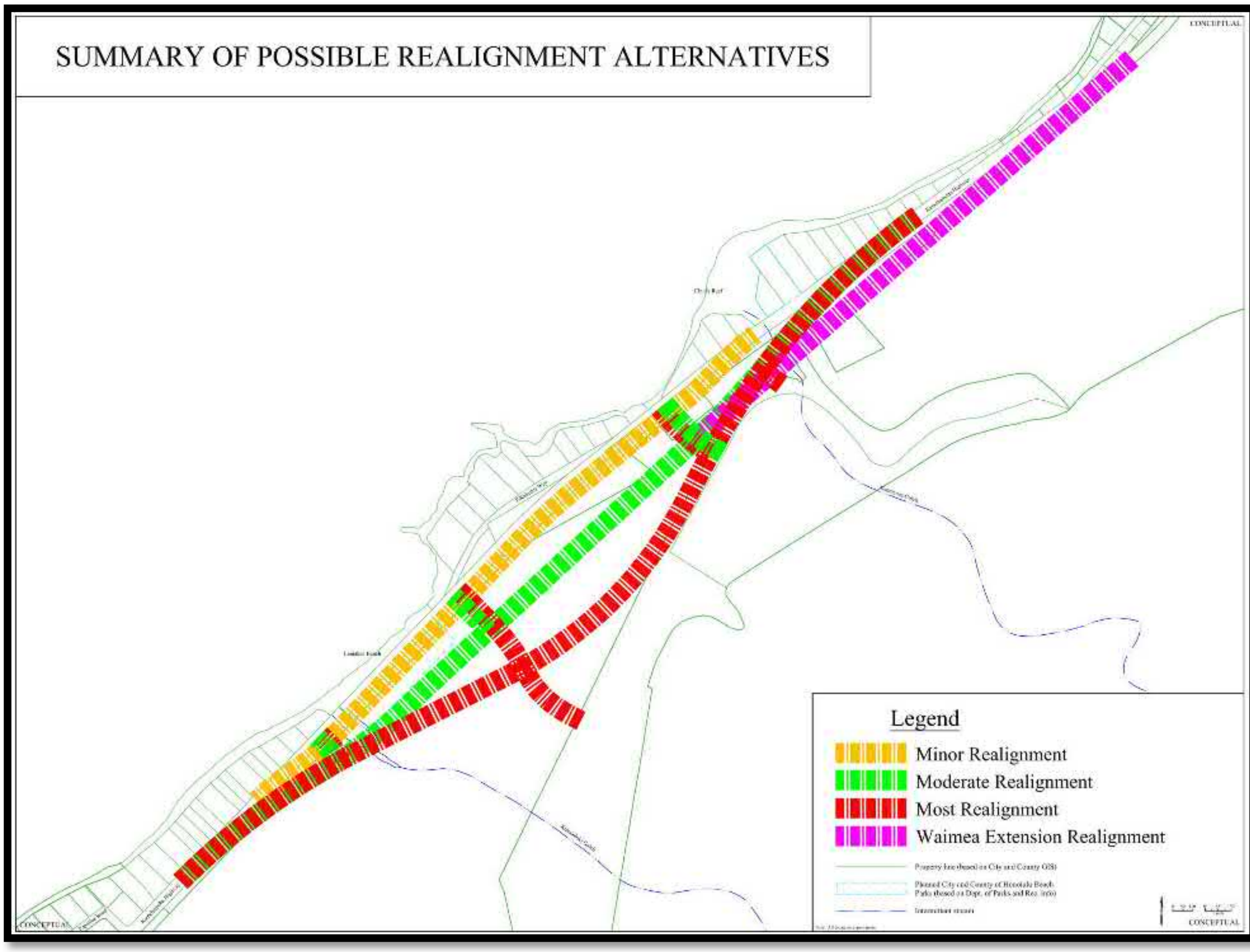


Figure 2-8. Other Principal Alignments Considered

Alternatives that did not involve realignment, such as building a pedestrian bridge or signalizing the crosswalks, were also considered. See Section 2.5.7 for a discussion of non-realignment alternatives.

2.5.1 Most Realignment Alternative

A well-studied and strongly considered alternative is known as the "Most Realignment" Alternative. It is similar to realignments previously discussed by the DLNR's Office of Conservation of Coastal Lands (Section 1.4).

The "Most Realignment" generally consists of realigning Kamehameha Highway mauka as far as feasible from a location on the Haleiwa side of the Lauhulu Stream bridge to the Waimea side of Ashley Road, a distance of roughly 0.8 mile. A typical section of the realigned highway is provided in Figure 2-9 and a plan view is shown in Figure 2-10. The realigned highway would cross the relatively low-sloped coastal plain and run along the base of the relatively steeper "pali" where a former cane haul road exists. By utilizing the existing cane haul road, the "Most Realignment" would be less likely to encounter undiscovered archaeological sites.

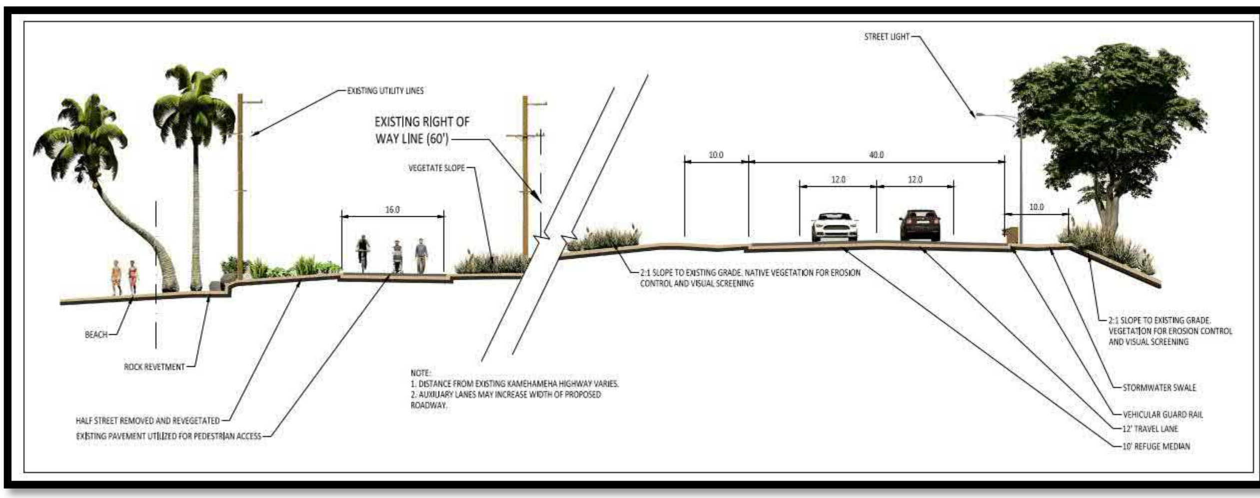


Figure 2-9. "Most Realignment" Typical Section

Figure 2-10. “Most Realignment” Alternative Plan View

The components of this Alternative included:

- Guardrails and fencing on both sides of Kamehameha Highway.
- Existing cross streets and driveways would be modified to allow access to the shifted Kamehameha Highway.
- Streetlights would be installed on the mauka side of the highway every 120 feet.
- Two new bridges. One at Lauhulu Stream (on the Haleiwa side of Laniakea Beach; also referred to as Lauhulu Stream/Kukaiohiki Gulch) and one at Kawailoa Stream (near Chun’s Reef).
- A 16-foot wide shared use path on one lane of the existing Kamehameha Highway for bicycles and pedestrians. The other lane would be partially removed and naturalized.
- A new plantation access road to provide access to properties and the City DPR’s future beach support.

This alignment was developed after evaluating many other inland alternatives. It was the most studied inland alternative because its impacts on cultural and historic resources were not well known until the project had advanced through many of the steps of environmental review process (see Section 3.3).

This Alternative was removed from consideration because of significant impacts on cultural and historical resources, cost, schedule, and effects on Kamehameha Schools' property.

As described in Section 3.4, Kamehameha Schools, as the property owner, and the Polynesian Voyaging Society steward a cultural site named Kahokuwelowelo Heiau located mauka of the project area for observations and training youth in traditional navigation and culture. This important site was deemed too close to the Most Realignment to avoid light, noise, and other unacceptable impacts from this alternative. Modest changes in the alignment, road geometry, and lighting on the Most Realignment were deemed ineffective in preserving the setting of this historical and cultural resource. In addition, the proposed highway alignment would bifurcate the cultural landscape, diminishing the historic and cultural context of the area.

Kamehameha Schools, besides being guardians of the area's cultural heritage, was also concerned with the highway's incursion into their property. They have had numerous occurrences of trespassing, incidents involving cattle, and breeches of their security. The Most Realignment would have created an orphan property between the old Kamehameha Highway and the new highway. The orphan area would likely be used to walk between the old and new highways and for illegal camping. The area contains numerous important historic and cultural properties that would be threatened or destroyed by these illegal activities.

A conceptual project schedule for this Alternative, showing that it would take about six (6) years to construct the realigned highway, was also unacceptable to HDOT.

After the pedestrian accident in 2019, HDOT's concern for pedestrian safety motivated the State to find a new funding source that could be used for the project. The Pedestrian Shift Alternative could be constructed with State funds from rental car surcharges rather than the federal funds for protecting the highway from erosion. This would enable a shorter environmental review process timeframe and allow for an expedited design and construction timeframe.

2.5.2 Minor Realignment Alternative

The "Minor" Realignment Alternative generally consists of realigning Kamehameha Highway mauka roughly 60 feet from its current location from the Haleiwa side of Lauhulu Stream bridge to the Haleiwa side of Kawailoa and placing a revetment on the makai side of the realigned highway. The alignment is somewhat similar to the Pedestrian Shift, but the elevation of the highway would also be raised roughly 6 to 10 feet vertically. This would be achieved using an earthen embankment and revetment which would be located near the existing highway's location and consist of large boulders or other suitable material.

This Alternative was rejected for its impact on the shoreline and coastal processes. As the sea encroaches on the beach, the revetment would have acted as a seawall, removing the beach and destroying sea turtle habitat.

2.5.3 Quinlan Realignment Alternative

The "Quinlan" Alternative (Figure 2-11) was presented to the Task Force on September 25, 2013 by Bill Quinlan. The same basic design was published in the Star Advertiser on July 14, 2015 by concerned North Shore residents. The alignment would move Kamehameha Highway inland directly in front of Laniakea beach. The geometry of the proposed highway has curves that would be too tight for the speed limit. In this vicinity, Kamehameha has a 45 mile-per-hour (mph) design speed and is signed for 35 mph. To accommodate such tight turns, a 20 mph design speed would have been required and the turns would have been signed for 10 mph. When the curves are 'smoothed out' the alignment essentially becomes the Pedestrian Shift Alternative, the project proposed in this EA. The Pedestrian Shift can be built following geometric design parameters and standards.

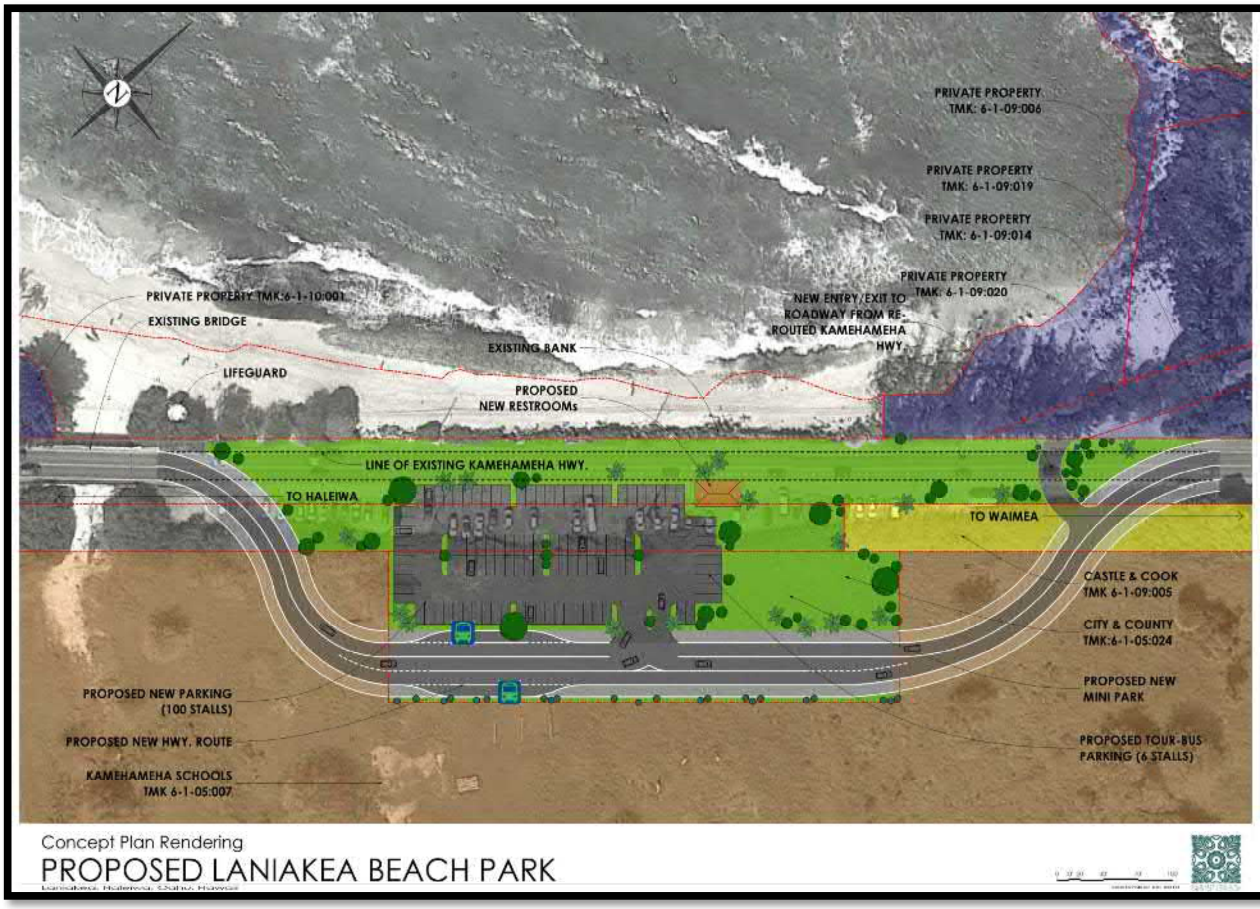


Figure 2-11. Quinlan Realignment Alternative **(note that TMK 6-1-05:007 as shown on the figure is not owned by Kamehameha Schools. The property should be correctly identified as TMK 6-1-005:026)**

2.5.4 Moderate Realignment Alternatives

Many other alignments like the "Moderate" Realignment Alternative (shown in green on Figure 2-8) were also considered between the Minor and Most realignments. These alignments had greater impacts on the archeological sites that were identified during early pedestrian surveys for the project and had a greater possibility of uncovering additional, as of yet, unidentified sites during construction.

2.5.5 Waimea Extension of Realignment

Also considered was a plan to continue realigning Kamehameha Highway inland for another approximately half mile toward Waimea as part of the Moderate or Most realignments. The extension would allow a longer straight road but would have affected Kawailoa Ranch's riding trails and Tin Roof Ranch's frontage, as well as eliminate several driveways on Kamehameha Highway. This extension was eliminated because the primary purpose of the project is to address safety.

2.5.6 Pedestrian Shift Alternative Configuration Options

The following configuration options were considered for the Pedestrian Shift Alternative based on suggestions during the pre-EA scoping comments. Some of these options are still under consideration and are marked with an asterisk (*).

- Once realigned, using the existing Kamehameha Highway for access to a parking area. The suggestion was to use Pohaku Loa Way to connect back onto the highway, thus preventing cars from backing out of stalls onto the highway. This could not be considered because Pohaku Loa Way is a private street. In addition, any alternative that leaves Kamehameha Highway as a frontage road was rejected because HDOT cannot retain two parallel/redundant routes.

- Another suggestion was to use the entire City DPR park land as temporary parking or to consider Kamehameha Schools property for parking while the Pedestrian Shift is constructed. This mitigation would not be possible because it would require pedestrians and the general public to pass through active construction work zones.

- A suggestion was made to decrease lane width to slow traffic down if the Pedestrian Shift Alternative is constructed. Reducing the lanes to 11 feet will be considered as the project design progresses. *

- The suggestion to stripe the 10-foot median of the realigned highway for a turn lane will be further evaluated during final design. Current plans include a left-turn lane that would be striped for access to Pohaku Loa Way for residents. This median lane becomes striped as a storage lane area where cars may wait or queue without impeding traffic.

  During final design, HDOT will evaluate whether installing guardrail with openings on the makai side of the realigned highway is needed for circulation, this may have a bearing on how the lanes are striped. *

- Suggestions were made not to place a guardrail on the mauka side of the existing highway during construction of the Pedestrian Shift Alternative because this configuration of the Pedestrian Shift Alternative would limit coastal access until the new parking area was available.

  A guardrail along the existing highway during construction would be needed for the safety of highway operations, pedestrians, and construction workers. Temporary parking and construction in the same area would cause for extremely unsafe conditions between the public and the construction work, therefore temporary parking during construction could not be committed to. Additionally, the reduction of these unsafe conditions would assist in a timely construction completion.

- In conjunction with the Pedestrian Shift Alternative, the suggestion was made to naturalize the entire existing Kamehameha Highway instead of leaving a 14-foot-wide portion of the old highway in place and naturalizing only half. Bikes are rarely seen on Kamehameha Highway as it is a dangerous road for biking so there would be no regional connectivity. In addition, the asphalt half of the old highway could be used for unpermitted commercial purposes such as surf schools or lunch wagons. In addition, vegetation would help with the erosion control and make the area more scenic. Planting trees could block the ocean view and drivers would not be as distracted. Vegetation also prevents cars from parking in places that block visibility.

Re-purposing the existing Kamehameha Highway as a shared use path allows for the historic Lauhulu Bridge to remain in place with some function or context, while initiating a link for regional future multi-modal connectivity consistent with community and regional plans. It is a secondary purpose and need for the projected as described in Section 1.5.4. Measures such as bollards or recycled telephone poles are proposed to protect the path for non-motorized, maintenance, and emergency vehicle use only.

2.5.7 Non-Realignment or Crossing Alternatives

Erecting a pedestrian bridge or crosswalks were also options that were discussed at various times during the planning process. However, it is shown that pedestrians prefer to limit walking distance and will often take usual shortcuts to save even a few steps and seconds of time (Texas Transportation Institute, 2000). This study showed that virtually no one will use a pedestrian overpass if it takes 25% longer to cross compared to crossing at grade.

While the No Build Settlement Alternative includes crosswalks, HDOT usually does not provide signalized crosswalks where no sidewalks exist. In addition, there is a question of how much pedestrians would use a crosswalk. Pedestrians are likely to cross the highway when they see an opening, rather than waiting at a crosswalk. In addition, the pedestrians would still be stopping traffic, which has been a cause for congestion.

2.6 Project Cost and Schedule

Cost estimates for the Pedestrian Shift Alternative were generated based on conceptual engineering. Construction costs are estimated at $12,000,000 without including the costs to obtain rights-of-way. The project would be constructed with State funds only.

The project schedule is as follows:

- Completion of Environmental Review: December 2021
- Obtain SMA Use permit: July 2022
- Complete Design: January 2023
- Accept Bids to Construct: June 2023
- Award Construction Contract: December 2023
- End Construction: June 2025

2.7 Permits and Approvals

Table 2-1 lists approvals and permits that may be required prior to the construction of the proposed project. Applications for most of these permits cannot be made until the HRS Chapter 343 environmental review process is complete.

Table 2-1. Permits and Approvals

Agency	Permit or Approval	Status
Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD)	HRS Chapter 6E-8 Review	Coordination on-going. See Section 3.4.
DLNR, Land Division	Shoreline Certification	The Shoreline was certified on July 30, 2020. DOT is in coordination with the City Department of Planning and Permitting (DPP). DPP Rules allow this certification to remain valid for up to two years (expiration would then be July 30. 2022).
DLNR, Office of Conservation and Coastal Lands	Conservation District Use Permit	Portions of the project are within the Conservation District, based on Shoreline Certification July 30, 2020. Because all project elements makai of the shoreline are within the existing roadway right-of-way, the State Highway exemption codified in HRS 264-6(2) applies. Exceptions or instances where the requirement for a Conservation District design review or approval may be needed is under evaluation.
City and County of Honolulu, Department of Planning and Permitting	Special Management Area Use Permit and Shoreline Setback Variance	To be obtained once HRS 343 is complete.
City and County of Honolulu, Department of Planning and Permitting	Subdivision Application	To be initiated during final design.
Department of the Army (DA); (U.S. Army Corps of Engineers, Regulatory Branch)	CWA Section 404, Department of the Army Permit	New bridge abutments would be outside the stream channel. A certified wetland delineator surveyed the project area, and a jurisdictional determination has been prepared that indicate no wetlands will be impacted by the project. Coordination of these findings with the U.S. Army Corps of Engineers is ongoing. See Section 4.2.3.
Department of Health (HDOH), Clean Water Branch (CWB)	CWA Section 401 WQC	Required only if Section 404 permit is required.
DLNR, Commission on Water Resource Management (CWRM)	Stream Channel Alteration Permit (SCAP)	Not required. Bridge designed to avoid altering stream channel.
HDOH, CWB	National Pollutant Discharge Elimination System (NPDES) Permit for storm water discharges relating to construction activities	To be obtained during final design.
HDOH, Indoor Air and Radiological Branch	Noise Permit	To be obtained during final design.

Agency	Permit or Approval	Status
HDOH, Indoor Air and Radiological Branch	Noise Variance	To be obtained during final design if off-hours (i.e., night/weekend) construction is needed.

3.0 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION

This chapter describes the existing environmental conditions of the project site, potential long-term impacts of each project alternative, and the proposed mitigation measures to avoid, minimize, or mitigate those potential effects. The relative impact that will likely remain after mitigation is also described. Each section within this chapter is dedicated to analyzing a specific environmental or social discipline. Short-term potential construction phase impacts are discussed in a single section, Section 3.16.

The information about existing conditions, potential impacts, and potential mitigation measures presented in this chapter has been developed through (a) the review and use of existing information related to the project areas (see references section); (b) studies conducted specifically for this project (see appendices); (c) coordination with regulatory agencies; and (d) consultation with stakeholders.

3.1 Physical Geography and Coastal Processes

3.1.1 Existing Condition

Geographic Setting

The project is located on the edge of the northwest flank of the Koolau Mountains. Prominent physical features in the vicinity of the project site are the shoreline, which transitions from a relatively wide sandy beach in the southwest of the project area, fronting the surf spot known as Laniakea's, then running northeast to a rugged basaltic rocky headland which fronts the surf spots known as Hultin's and Jocko's. The intersection between the sandy beach and the rocky point forms a relatively sheltered cove, where sea turtles are known to congregate in large numbers, drawing large crowds of tourists and visitors who come to see the protected marine animals. A small stream variously referred to as Lanaikea Stream/Lauhulu Stream/Kukaiohiki Gulch, cuts a modest natural drainage channel from mauka to makai, running under the small bridge at the southwest end of Laniakea Beach. The terrain slopes generally upward to the Koolau mountains from the Highway until it reaches a steep-sided escarpment, the base of which is approximately 800 feet from the Highway, beginning at roughly 60 feet above mean sea level (MSL). The makai area is heavily developed with private homes along the shoreline and Highway and scattered with structures and farmland mauka of the Highway. Appendix D, a Coastal Engineering Assessment for the Kamehameha Highway Pedestrian Safety Realignment at Laniakea Beach prepared by Sea Engineering, Inc., provides a detailed description of the geographic setting.

The geology between the volcanic basalt mountains and the coast is Holocene alluvium with sandy beach deposits interbedded with the alluvium. Rock formations on the beach include basalt outcrops, reef rock (coralline limestone), and beach rock (cemented beach sand). The soils mauka of the beach sand at Laniakea Beach have been classified by the Natural Resources Conservation Services (USDA- NRCS, 1972) as Waialua Silty Clay, a phase of the Waialua Series of moderately well-drained soils on alluvial fans derived from weathered basalt and present on smooth coastal plains. Oahu is in the Uniform Building Code seismic zone 2A for earthquakes.

Coastal Erosion

Shoreline erosion for many Hawaii coastlines is caused by hurricanes/storm surge, waves, extreme tides, and occasionally tsunami. With additional erosional pressures likely due to climate change and sea level rise, it is prudent to consider the area at risk. As described in Appendix D, the Coastal Engineering Assessment, Laniakea Beach is dynamic, showing large variations in sand distributions, but the long-term shoreline position appears stable.

The University of Hawaii Coastal Geology Group (UHCGG, 2010) conducted a shoreline erosion study for Oahu by analyzing the position of the beach low water mark on a series of historical aerial photographs. The UHCGG transect study shows areas of long-term beach toe recession on the order of 0.5 to 1.0 foot per year, and similar areas of accretion on the order of up to 0.5 foot per year (Figure 3-1).

Figure 3-1. Historical aerial photograph analysis by UHCGG

Although shoreline erosion is difficult to quantify on the North Shore because of the inherently dynamic beaches, recent erosion episodes and indicators, including preventive measures on Laniakea Beach, have shown the vulnerability that exists. With additional erosional pressures likely due to climate change and sea level rise, the project area is at risk. If historic trends continue as illustrated in Figure 3-1, Kamehameha Highway could be eroded away in the near future.

Sea Level Rise

Sea level rise has the potential to impact beaches and shorelines in Hawaii. Impacts may include beach narrowing and beach loss, loss of land due to erosion, and infrastructure damage due to inundation and flooding. The impacts from anomalous sea level events (e.g., king tides, mesoscale eddies, storm surge) are also likely to increase. A 2015 study found that, due to increasing sea level rise, average shoreline recession (erosion) in Hawaii is expected to be nearly twice the historical extrapolation by 2050, and nearly 2.5 times the historical extrapolation by 2100 (Anderson et al., 2015).

The State of Hawaii recently published the Hawaii Sea Level Rise Vulnerability and Adaptation Report (Hawaii Climate Change Mitigation and Adaptation Commission (HCCMAC), 2017), which discusses the anticipated impacts of projected future sea level rise on coastal hazards, and the potential physical, economic, social, environmental, and cultural impacts of sea level rise in Hawaii. The State of Hawaii conducted numerical modeling to estimate the potential impacts that a 3.2-foot rise in sea level would have on coastal hazards including passive flooding, annual high wave flooding, and coastal erosion. Figure 3-2 shows the annual high wave flooding exposure area in the vicinity of the project area with 3.2 feet of sea level rise.

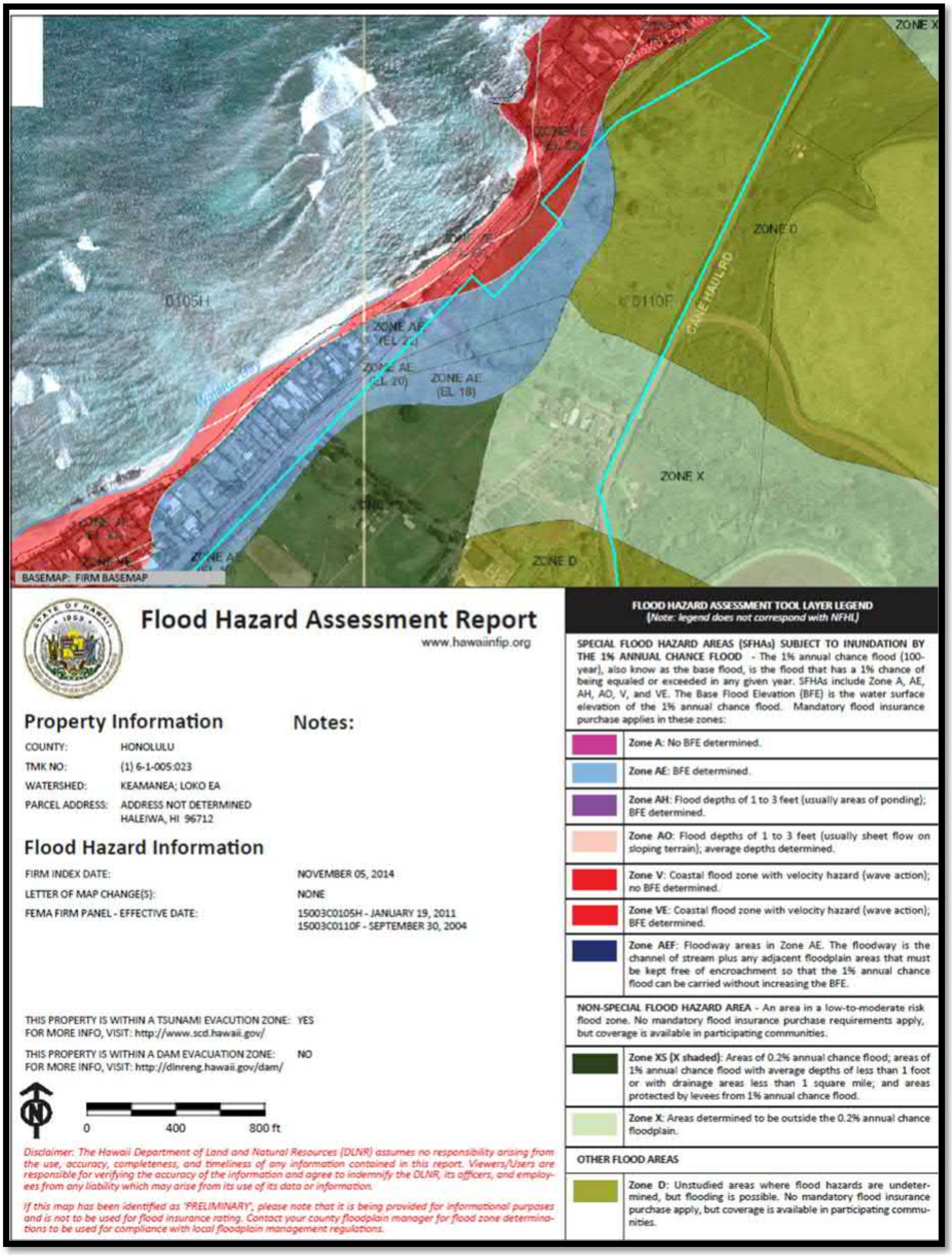
The Statewide Coastal Highway Program Report (SCHPR) is a report authored by University of Hawaii (UH) researchers (primarily from the Department of Civil and Environmental Engineering) for the State of Hawaii Department of Transportation. The report was released in August 2019 (Francis et al, 2019). The report includes the definition of an index system, referred to as the Coastal Road Erosion Susceptibility Index (CRESI) to rank coastal roadway systems by their susceptibility to erosion and structural collapse. The CRESI system ranks the project area as having a high susceptibility to coastal erosion. In addition, the CRESI study rates roads that when damaged by coastal hazards, the resulting losses can be substantial and unduly large. The SCHPR report’s adaptation recommendations for the project stretch are to monitor the site.

Floodplains and Flood Hazards

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), maintains floodplain and flood hazard maps for use in determining a reference height that allows property insurance companies to assess flood risk, known as the Base Flood Elevation. On the North Shore of Oahu, Hawaii, the 1% annual flood risk is considered by FEMA to be a result of tsunami wave inundation, and not from storm surge or rainfall accumulation.

The existing Kamehameha Highway in the project area is mostly in the VE zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves (including tsunami runup) and Zone AE (combined zones also in the 100-year flood limits). The current roadway is sometimes (regularly or annually) closed during high surf and flooding because it is rendered too hazardous to travel (NSSCP, 2011). A small portion of the existing highway mauka of Pohaku Loa Way is in Zone D where flood hazards are undetermined, but possible. The FIRM maps indicate that homes on the makai side of Kamehameha Highway in the project area are in flood hazard zones indicating high risks of flooding (Figure 3-3).

Figure 3-2. Annual High Wave Flooding at Laniakea Beach under a 3.2-foot Sea Level Rise Scenario



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 6-1-005:023
WATERSHED:	KEAMANEA; LOKO EA
PARCEL ADDRESS:	ADDRESS NOT DETERMINED HALEIWA, HI 96712

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL - EFFECTIVE DATE:	15003C0105H - JANUARY 19, 2011 15003C0110F - SEPTEMBER 30, 2004

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: YES
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

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

0 400 800 ft

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

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

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

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

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

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

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

OTHER FLOOD AREAS

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

Figure 3-3. Flood Hazard Assessment Report

Tsunami Hazards

Multiple government agencies attempt to describe and illustrate the hazard created by tsunami to protect the community. A tsunami is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean. They are commonly caused by large magnitude earthquakes (typically magnitude 7.0 or greater). Tsunami often travel outwards in a series of waves which occupy the entire water column, even at abyssal depths. Tsunami waves typically have small wave heights in deep water but can have wavelengths of hundreds of miles and travel at speeds up to 500 miles per hour. A tsunami can travel from one side of the Pacific to the other in less than a day. The speed decreases rapidly as the water shoals. The waves increase greatly in height as they shoal, and tsunami runup can push far inland at high speed. Receding waters may also have considerable speed, and the recession often causes as much damage as the original wave front itself.

Most tsunami in Hawaii originate from the tectonically active areas located around the Pacific Rim (e.g., Alaska, Japan, and Chile). Waves created by earthquakes in these areas take hours to reach Hawaii, and the network of sensors that is part of the Pacific Tsunami Warning System can provide Hawaii with several hours of advanced warning prior to the arrival of tsunami waves generated from these locations. Less commonly, tsunami originate from seismic activity in the Hawaiian Islands, and there is less warning for these locally generated events.

Historical tsunami runup in Haleiwa has been recorded as far back as 1878. Table 3-1 is a list of recorded tsunami runup data for the Haleiwa area.

Table 3-1. Historic Tsunami Runup for Haleiwa

Year	Runup (feet)	Source Area
1878	9	Aleutian Islands
1923	12	Kamchatka
1946	11	Eastern Aleutian Islands
1652	17	Kamchatka
1957	17	Central Aleutian Islands
1964	15	Gulf of Alaska
1994	2	Kuril Islands

Sea Engineering Inc. (SEI) applied a FEMA-recognized and accepted methodology to calculate tsunami runup elevations along the Laniakea project site for existing ground conditions, where runup is defined by the United States Geological Survey (USGS) as, "…a measurement of the height of the water onshore observed above a reference sea level"—in this case, MSL. Existing calculations completed by FEMA are based on the same method; however, cross shore transects were spaced far apart (hundreds of meters) along the shoreline. The FIRMs represent the inundation contours interpolated between these far-spaced calculated transects, as determined by floodplain engineers. By comparison, SEI used tightly spaced transects along the shoreline to provide significantly higher resolution for the inundation results. As expected, since the FIRMs used essentially the same method as the SEI study to determine for the hazard zones, the Base Flood Elevation contour values were comparable to the calculated tsunami wave surface elevation values from this analysis. However, because SEI used more closely spaced transects, the calculated tsunami wave surface elevation values from this analysis are much more precise and can provide greater resolution and insight into localized flooding.

Tsunami Evacuation Zones

The State has determined evacuation zones to inform the public about evacuating the area when a tsunami is predicted. Based on the Tsunami evacuation zone maps prepared by the City's Department of Emergency Management, the project area is within the tsunami evacuation zone (Figure 3-4).

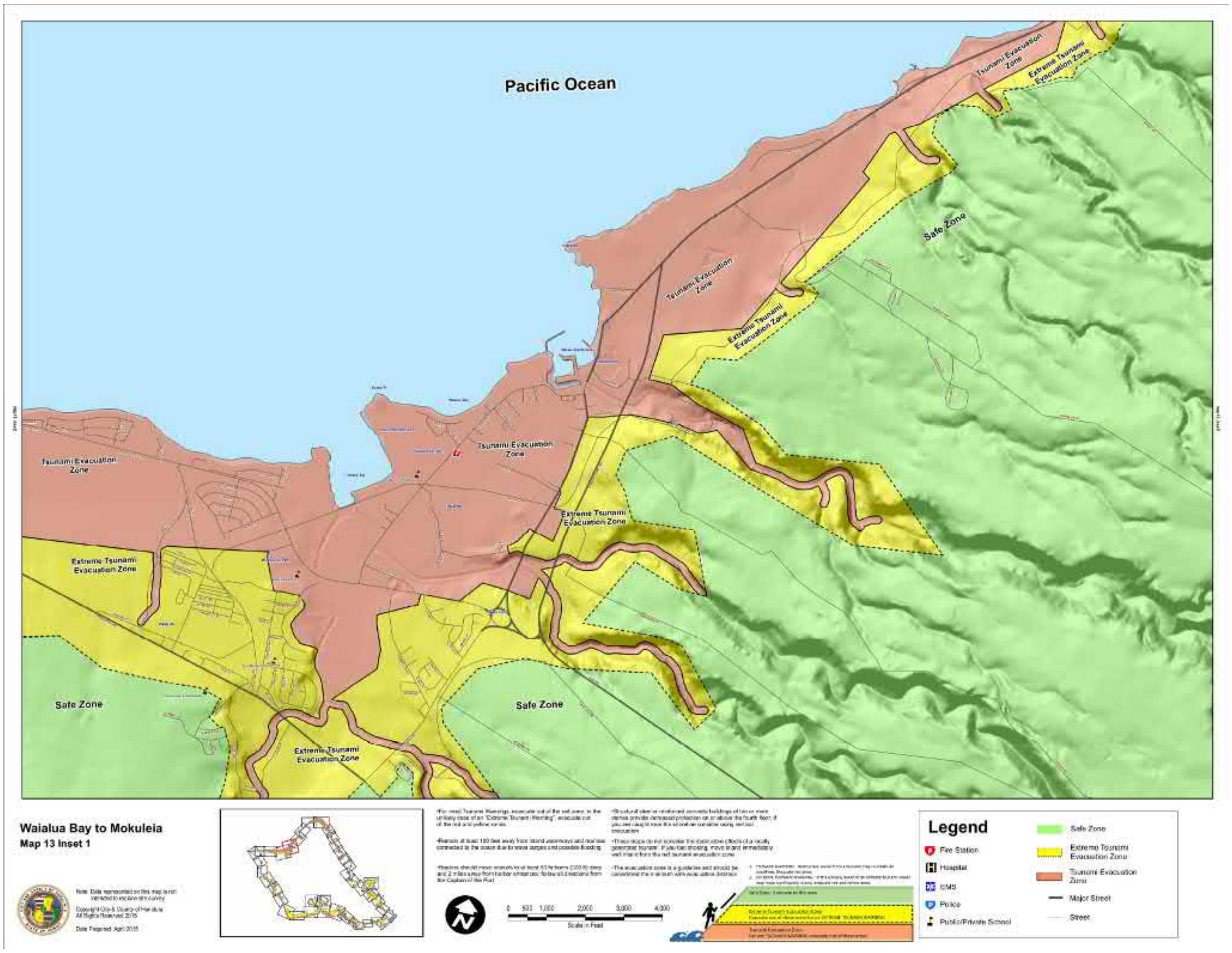


Figure 3-4. City and County of Honolulu Tsunami Evacuation Zones

3.1.2 Potential Impacts

No Build Alternative

Coastal Erosion

Under the No Build Alternative, Kamehameha Highway could be eroded away in the near future, and this section of roadway would remain susceptible to periodic closures during high wave and storm events. It is anticipated that HDOT would continue to address the undermining of the Highway through emergency maintenance repairs, so these closures would be somewhat temporary. Depending on the severity of the damage or extent of undermining, the road could be out of service anywhere from just a few hours to 9-12 months. Its service would become less and less reliable. Loss of a single road such as Kamehameha Highway in the project area can disrupt traffic flow patterns over a large area, block emergency access, and material delivery.

Sea Level Rise

Figure 3-2 shows the annual high wave flooding inundation that would take place with 3.2 feet of sea level rise in the project area. The results show that the existing Highway could be overtopped and inundated periodically with greater severity and extent than experienced currently for the benchmark year (year 2100).

Not shown in the figure is that much of Kamehameha Highway within the project area would already be inundated by the 0.5-foot sea level rise, a benchmark that is projected for year 2030 (HCCMAC, 2017 and 2021).

Similar to the effects of coastal erosion, is anticipated that HDOT would continue to address the Highway flooding through emergency maintenance repairs, so closures would be somewhat temporary, assuming the passive flooding model. Under more extreme scenarios of flooding, the road could be rendered out of service until remediation is done. Loss of Kamehameha Highway in the project area would cause severe disruptions to the community's access to goods and services along the North Shore, including emergency access, and material delivery.

Flood and Tsunami Hazards

Kamehameha Highway would remain in the tsunami evacuation area prepared by the City's Department of Emergency Management.

No Build Settlement Alternative

Coastal Erosion

Under the No Build Settlement Alternative, similar to the No Build, Kamehameha Highway would become less and less reliable. Loss of a single road such as Kamehameha Highway, even temporary, in the project area can disrupt traffic flow patterns over a large area, block emergency access, and material delivery. Because Kamehameha Highway would provide access to a City parking area in this scenario, the area used for parking would be inaccessible, flooded, and rendered out of service until remediation is done.

Sea Level Rise

Under the No Build Settlement Alternative, similar to the No Build, Kamehameha Highway would become less and less reliable. Under more extreme scenarios of flooding, the road and access to the City parking area would be flooded and rendered out of service until remediation is done. Loss of Kamehameha Highway in the project area would cause severe disruptions to the community's access to goods and services along the North Shore, including emergency access, and material delivery.

Flood and Tsunami Hazards

Kamehameha Highway would remain in the tsunami evacuation area prepared by the City's Department of Emergency Management.

TSM Alternative

Coastal Erosion

The TSM Alternative would not meet the project's stated purpose and need to improve the Highway's reliability for service, as it would not address Kamehameha Highway's vulnerability to coastal erosion (See Section 1.5.2).

Sea Level Rise

The TSM Alternative would not meet the project's stated purpose and need to improve the Highway's reliability for service (See Section 1.5.2).

Flood and Tsunami Hazards

Under the TSM Alternative, the existing flooding issues and evacuation zones would remain unchanged. The guard rail on the mauka side of the Highway would not effectively block flooding hazards or tsunami runup.

Kamehameha Highway would remain in the tsunami evacuation area prepared by the City's Department of Emergency Management.

Pedestrian Shift Alternative

Coastal Erosion

The proposed project would protect Kamehameha Highway from the impacts of erosion by shifting the road approximately 80 feet inland. In addition, as described in Section 2.4, the proposed highway consists of normal asphalt road structure with a buried concrete cut-off wall on the makai edge as a provision to reduce the future potential undermining of the roadway.

Sea Level Rise

The proposed project would protect Kamehameha Highway from the impacts of sea level rise by shifting the road approximately 80 feet inland. Inland relocation minimizes the extent of Kamehameha Highway's projected vulnerability to flooding caused by a 3.2-foot sea level increase (year 2100). Under the current models, the proposed realigned Highway would remain outside the sea level exposure area at the 2.0-foot sea level rise benchmark (year 2075) (HCCMAC, 2017 and 2021).

As sea level rise surpasses the 2.0-foot sea level rise benchmark and approaches the 3.2-foot sea level rise (year 2100), the realigned Highway would begin to experience inundation at the lower-lying areas near Lauhulu Stream Bridge. Based on this understanding, the proposed realignment would serve as a mid-term mitigation, providing an additional 45 years of reliable service.

As described in Section 2.4, the proposed highway consists of normal asphalt road structure with a buried concrete cut-off wall on the makai edge, which would protect the road from being undermined or washed out during severe flood events.

Flood and Tsunami Hazards

Kamehameha Highway would be realigned with a similar elevation as the existing roadway. Grading and filling would be required to accomplish this. According to the locally specific tsunami modeling conducted for this project, under the Pedestrian Shift Alternative, the new road would continue to be in the flood zones VE, AE, and D. Homes on the makai side of Kamehameha Highway in the project area would remain in the flood hazard zones indicating high risks of flooding, as they currently are. Modeling results also showed that the water surface elevation during a flood would potentially change due to the proposed project, mostly in the vicinity of Lauhulu Stream. As a result, the Pedestrian Shift Alternative could ‘trap’ the tsunami in a limited area predominantly in front of the beach due to the barrier effect of the elevated road decks, potentially causing a localized increase (compared to existing) of tsunami water surface elevation levels adjacent to or over the proposed new roadway. It can be seen in Figure 3-5 that a visible area of wave surface elevation increase—by approximately 1 foot—appears over the new road deck on the northeast side of the bridge over Lauhulu Stream, along with an even shallower area of increase (less than 1 foot) located approximately 500 feet further down the new road alignment in the Waimea direction. The greatest increase of up to 1.4 feet would be adjacent to the bridge. This increase is countered by a slight decrease in wave surface elevation across the extent of the runup mauka of the new road alignment (shown as light blue on Figure 3-5). Inland inundation distance is unchanged at all other locations. In considering these changes, it is important to note that SEI used closely spaced transects to provide a greater resolution or detailed view of localized flooding. Whereas FIRM maps use transects that are hundreds of meters apart to interpolate inundation contours, the contours developed in the SEI model were tightly spaced. Thus, the level of change detected, when viewed from a flood zone or FIRM map perspective, are not sufficient to change the flood zone or Base Flood Elevations.

The area most impacted by the tsunami inundation would be Kamehameha Schools’ property near the Lauhulu Stream, which is part of the Kawailoa Ranch. The area near the stream is a low-lying area used for grazing cattle, and is subject to periodic flooding, likely from mauka rainfall and ocean runup. Remnants of the City’s property that occur mauka of the realigned highway and Kawailoa Ranch’s riding trails would experience a shallow increase. No habitable structures would be affected.

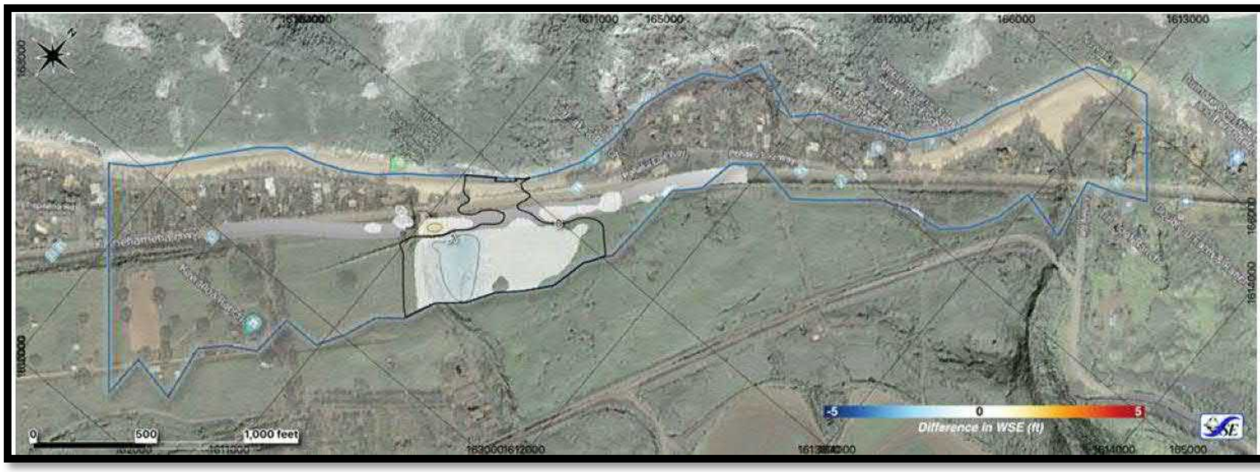


Figure 3-5. Illustration of the Difference Between the Existing Tsunami Wave Surface Elevation and Modeled Change in Wave Surface Elevation Caused by the Proposed Project (Wave Surface Elevation Contours in Feet)

There would be no impact on the tsunami evacuation zone map prepared by the City's Department of Emergency Management. Both the existing highway and the proposed project are within the tsunami evacuation zone (Figure 3-4).

3.1.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

Under the TSM Alternative, no Avoidance, Minimization, and Mitigation Measures are suggested. Seawalls, scour protection, beach sand maintenance and other temporary measures could be considered to protect Kamehameha Highway but are not part of this proposed project.

Pedestrian Shift Alternative

For tsunami hazards and floodplain development, modeling shows that the proposed road would be in the flood zones VE, AE, and D and would continue to be exposed to the threat of flooding caused by tsunami. Homes on the makai side of Kamehameha Highway would be unaffected by the proposed project and would remain in the flood hazard zones indicating high risks of flooding. Although modeling shows an area impacted by increased inundation, the affected area is in the cattle grazing areas on the Waimea side of Lauhulu Stream Bridge, the empty remnant City, and riding trails. Once the tsunami has passed, similar to other flood events currently experienced, the waters would recede, allowing grazing and use of the trails to resume. The increase in inundation would not affect any structures, so no Avoidance, Minimization, and Mitigation Measures are proposed. The potential hazard for the highway facility would not be eliminated but has been minimized by moving the road inland.

Changes to flood zones or to established Base Flood Elevations are not anticipated, therefore a Conditional Letter of Map Revision would not be required.

3.2 Land Use

3.2.1 Existing Condition

Land use in the project area has been static for the last few decades. Makai of Kamehameha Highway, privately-owned parcels with residential uses are present on either side of Laniakea Beach. In the Second Amended Stipulated Judgment filed on May 14, 2000 in Civil No. 99-2561-07 (the "Condemnation Order"), the City condemned a portion of Laniakea Beach identified as TMK No. 6-1-010:-17 owned by Kamehameha Schools (KS). The conveyance has not been completed yet and it is assumed that the City still intends for this portion of Laniakea Beach to be conveyed to City pursuant to the Condemnation Order. Land use mauka of the Highway is primarily owned by the City and County of Honolulu's Department of Parks and Recreation (City DPR) and KS.

Initially owned by Kamehameha Schools, the property directly mauka of Kamehameha Highway was procured by the City DPR to develop the "Laniakea Beach Support Park" across from Laniakea Beach. The park was planned to generally consist of a parking area, comfort station, and landscaping. Although an EA has been completed for the beach park project (City, 2005a), the City has indicated that they do not intend to move forward with its development.

The remainder of land mauka of Kamehameha Highway is primarily owned by Kamehameha Schools and is used for ranching, agriculture, and other cultural practices. Kawailoa Ranch operates nearest to the Highway with horse boarding, riding trails, and cattle grazing.

In terms of future land use trends, Kamehameha Schools' (KS) "Moku O Waialua North Shore Plan, Paalaa to Kapaeloa" plan (2010) outlines potential projects on their land holdings (roughly 26,200 acres) in the region (See Figure 3-6).

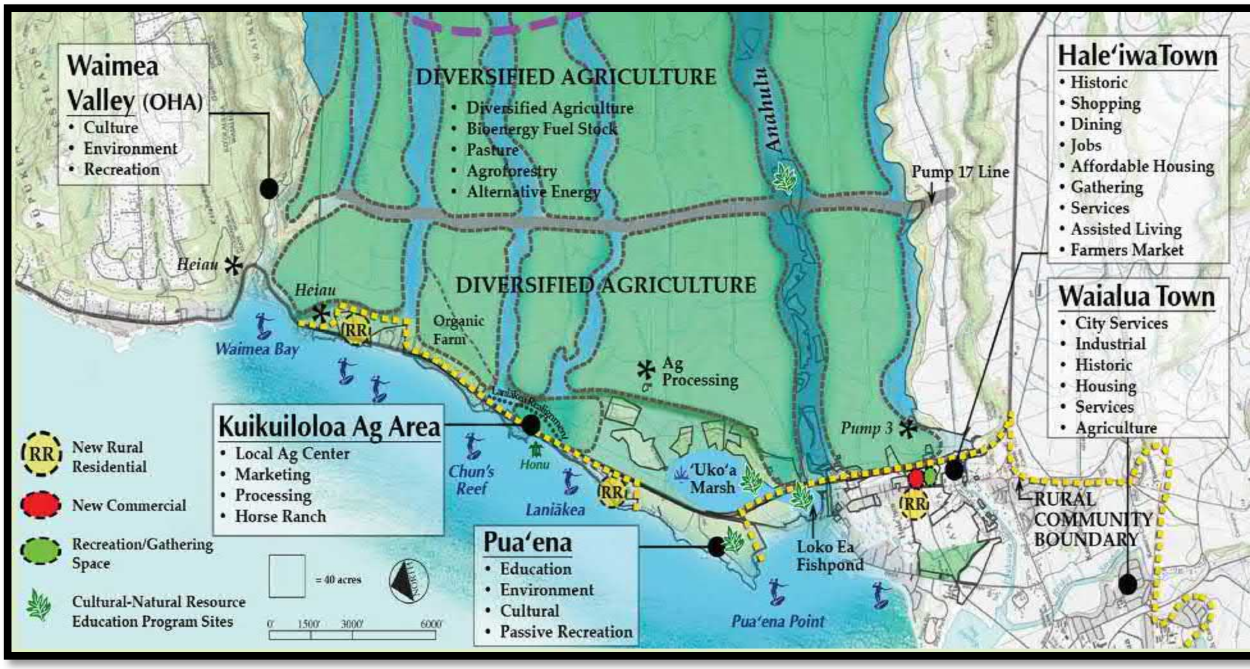


Figure 3-6. Map from Kamehameha Schools' Moku O Waialua North Shore Plan, Paalaaa to Kapaeloa

Intended to be consistent with the City's North Shore Sustainable Communities Plan, it includes the following potential future land uses in the project area:

- New infill residential housing areas in Papailoa and Kapaeloa. As presented in the plan, these projects will "develop approximately 40-50 and 70-80 market-priced house lots for custom home development, at lot sizes consistent with the surrounding residential subdivisions. Based on the plan map these two residential developments are not within the project area but would occur near the end of the project. KS is not actively pursuing these residential projects.
- Kuikuiloloa Agricultural Area is indicated on a plan map in the project area but is not described in detail in the plan nor is KS actively pursuing this project. As described in the plan, activities planned for this area include a "local ag center, marketing, processing, and horse ranch." The plan indicates "For the agricultural lands below the bluff, an agricultural water allocation has been obtained from the Honolulu Board of Water Supply and lessees will be transitioning to this new and reliable potable water source. Water and other infrastructure improvement to the Kuikuiloloa Ranch area will secure long term leases with existing and new tenants. The BWS water will be utilized for the Punanue Organic Farm that will increase diversified agriculture acreage and KS' commitment to sustainability."
- Diversified Agriculture would take place further mauka and include "diversified agriculture, bioenergy fuel stock, pasture, agroforestry, and alternative energy." A windfarm alternative energy project has already been developed in the mauka area.

Although the scale of the map does not allow for details concerning the exact alignment for Kamehameha Highway, the road's "Laniakea Realignment" is identified by the land use plan with the Kuikuiloloa Agricultural Area makai of the realignment. The plan suggests that Kamehameha Schools had initially anticipated an alignment further mauka. However, since the plan was published in 2010, the Polynesian Voyaging Society's Malama Honua Worldwide Voyage from 2013 to 2019, has reactivated the site as a kipuka for culturally based learning and place to celebrate Hawaii's native cultural heritage (August 16, 2019 letter from Kamehameha Schools). Accordingly, long term plans for the properties have shifted towards restoring cultural resources that occur within the area such that the mauka alignment is no longer a reflection of Kamehameha Schools' vision.

3.2.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, no land use impacts would occur.

No Build Settlement Alternative

Under the No Build Settlement Alternative, land use would be similar to the No Build as people would continue to park vehicles on the City DPR's property.

TSM Alternative

Under the TSM Alternative, no land use impacts would occur.

Pedestrian Shift Alternative

The Pedestrian Shift Alternative will require ROW acquisition as estimated in Table 3-2 and shown in Figure 3-7. Although coordination is on-going, negotiation on these acquisitions have not yet been finalized with the parcel owners; therefore, the exact acreages are unknown. The current estimate of total acquisition area is approximately three (3) acres.

Table 3-2. Summary of Potential ROW Acquisition

TMK	Area (acres)	Owner	Use	Pedestrian Shift Alternative Acquisition (estimated acres)
6-1-005:026	144	KSBE	Ranch/pasture	0.4
6-1-005:026	144	KSBE	Ranch/pasture	0.2
6-1-005:024	2.084	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.8
6-1-009:004	2.028	North Shore Taco, Inc.	Undeveloped, portion former OR&L ROW	0.15
6-1-009:021	0.707	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.07
6-1-009:022	0.389	KSBE	Undeveloped, former OR&L ROW	0.4
6-1-010:019	0.346	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.3
6-1-010:020	1.44	KSBE	Ranch/pasture; former OR&L ROW	0.5
Total				3 acres

Figure 3-7. Pedestrian Shift Alternative Alignment Map and Parcel Ownership

The Pedestrian Shift Alternative has been designed to avoid and minimize impacts to the City DPR's undeveloped park parcels to the degree possible. However, this Alternative impacts the Laniakea Beach Support Park to the extent that may require redesign of the facilities described in the EA (City, 2005a).

Compliance with eminent domain rules and regulations require fair compensation for the land acquired. The full amount of right-of-way to be acquired will be based on property owner negotiations.

Right-of-way acquisition would result in partial displacement of Kawailoa Ranch's pastureland located Haleiwa of Lauhulu Stream Bridge. Additionally, about 500 feet of a riding trail near Pohaku Loa Way would be affected. The City DPR's acquisition of the Kamehameha Schools property has already disrupted portions of the trail. These land use impacts are not anticipated to be so severe that they would cause the ranch to become inoperable. No land use would be totally displaced.

3.2.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

As noted in Section 3.2.2., none of the land use activities occurring on the affected parcels would be fully displaced. However, coordination with the landowners and tenants of affected parcels will be conducted during the project's design to avoid, minimize, and mitigate any unforeseen impacts to land use operations or activities. Any access, infrastructure, and/or improvements that are impacted will be relocated and/or replaced by DOT.

Any real property acquisitions or entitlements will be procured in accordance with federal, State and local regulations.

3.3 Historic and Archaeological Resources

3.3.1 Regulatory Requirements

HRS Chapter 6E-8 (HRS 6E-8), requires State agencies to take into account the effect their projects have on historic properties. Hawaii State statutes define "historic property" as any building, structure, object, district, area, or site, including heiau and underwater sites that is over 50 years old. Only those resources that are considered "significant" are protected by HRS 6E-8.

For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a. Be associated with events that have made an important contribution to the broad patterns of our history;

b. Be associated with the lives of persons important in our past;

c. Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d. Have yielded, or is likely to yield, information important for research on prehistory or history;

e. Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

Pursuant to HRS 6E-8, HDOT can render one of the following two possible findings for SHPD review and concurrence:

- No historic properties affected; or
- Effect, with proposed mitigation commitments.

"No historic properties affected" means that either there are no significant historic properties present, or there are significant historic properties present but the undertaking would have no effect upon them of any kind (HAR 13-275-7).

"Effect, with proposed mitigation commitments" means that the project will affect one or more significant historic properties, and the effects will be potentially harmful. However, the agency has proposed mitigation commitments involving one or more forms of mitigation to reasonably and acceptably mitigate the harmful effects.

3.3.2 Existing Condition

An archaeological inventory survey (Rechtman and Lauko 2020) conducted for the current proposed project identified two historic properties, one of which is also a cultural resource – a modified bedrock outcrop that may have been part of the ceremonial cultural landscape that also includes Kahokuwelowelo and Iliilikea heiau along with other related sites (See Section 3.4).

The recorded historic properties in the project area have been assessed for their significance based on criteria in HAR 13-275-6.

SIHP Site L-Bridge

The Lauhulu Stream Bridge (also known as Laniakea Stream or Kukaiohiki Gulch) (Site L-bridge) was previously evaluated as significant under Criterion c (MKE and Fung 2013:4-123) "for its association with early developments in concrete bridge construction in Hawaii." Citing it as "a is a good example of a 1930's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design." The current study found the bridge to be in the same condition as it was when it was earlier evaluated, with no diminished integrity; thus, the Lauhulu Stream Bridge continues to be evaluated as significant under Criterion c as a representative example of 1930s engineering and design in the context of roadway construction in Hawaii.

SIHP Site T-1

Site T-1 is a modified bedrock outcrop interpreted to be a possible ceremonial site. Given this functional interpretation, the site is assessed as significant under Criterion d as a potential source of information relative to pre-contact ceremonial activities within a cultural landscape where several other functionally similar sites have been identified, and under Criterion e for the cultural value that Hawaiian communities assign to such sites. Site T-1 lies within a parcel owned by Kamehameha Schools. While identified to be partially within the current study corridor, this site falls outside of the proposed development footprint.

3.3.3 Potential Impacts

No Build Alternative

Under the No Build Alternative, no historic properties would be affected.

No Build Settlement Alternative

Under the No Build Settlement Alternative, no historic properties would be affected.

TSM Alternative

Under the TSM Alternative, no historic properties would be affected.

Pedestrian Shift Alternative

Lauhulu Stream Bridge (also referred to as the Laniakea Stream Bridge) will not be physically impacted by the proposed roadway realignment project. A new bridge will be constructed inland along the proposed alignment. The historic bridge will remain in place for pedestrian use; thus, the recommended treatment is preservation in the form of avoidance and protection (conservation).

While Site T-1 is identified to be partially within the current study corridor, this site falls outside of the proposed development footprint, and once roadway construction is complete the realigned Kamehameha Highway will be no closer to Site T-1 than it is currently. Additionally, the area of Site T-1 will not be acquired by the HDOT, but rather will remain under the ownership and control of Kamehameha Schools. Thus, beyond making sure the site is protected during construction activities, any long-term treatment of the site is not within the purview of the HDOT. This finding has been shared with Kamehameha Schools, including the treatment of Site T-1 as ultimately their kuleana (right, responsibility).

3.3.4 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

Given the design of the proposed roadway realignment project, both sites identified within the study corridor will be physically avoided during construction. The Lauhulu Stream Bridge will be converted to pedestrian use, and Site T-1 will remain undisturbed on land owned by Kamehameha Schools. See Section 3.16.7 for protective measures to be employed during construction.

With respect to the Lauhulu Stream Bridge, both the change in use and the alterations of the immediate surrounding environment would be considered an effect as identified in HAR §13-275-7(b), thus the HRS Chapter 6E-8 determination of effect for the proposed project is "effect with proposed mitigation." In accordance with HAR §13-275-8(a)(1)(A), the proposed mitigation is preservation in the form of avoidance and protection (conservation).

Also, given the presence of Jaucus sand deposits within the current study corridor, as an additional precautionary mitigation, archaeological monitoring has been agreed upon between the HDOT and the SHPD. An archaeological monitoring plan will be prepared in accordance with HAR §13-279-4 and submitted to the SHPD for review and acceptance prior to initiating any ground-disturbing activity. If iwi kupuna are discovered during construction, all work shall be halted, the SHPD shall be contacted, and treatment of the site shall be conducted in accordance with HAR §13-300.

3.4 Cultural Resources

Gathering input from community members with genealogical ties and long-standing residency or relationships to the study area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural records of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts (OEQC 1997), the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area.

In order to prepare a Cultural Impact Assessment (CIA) Report in support of the project, ASM Affiliates identified the following 13 individuals and organizations as possessing knowledge related to the project area vicinity or other aspects related to the proposed highway realignment project:

Jan Becket*	Blake McElheney
John DeSoto*	Kathleen Pahinui
Malia Evans	Benton Kealii Pang
KAHEA – The Hawaiian Alliance	The Office of Hawaiian Affairs (OHA)
Shad Kane	Robert "Bobby" Robinson*
Bob Leinau*	Wailua Hawaiian Civic Club
Mike Lyons	

Of these 13 individuals/organizations contacted via email, USPS letter, and/or phone, four (4) individuals accepted the interview request. They are noted above with an asterisk (*).

OEQC Guidelines for Assessing Cultural Impacts – Section III regarding ethnographic and oral history interview procedures, suggests that the inclusion of "any constraints or limitations which might have affected the quality of the information as obtained" (OEQC 1997). In December 2019, the World Health Organization (WHO) detected an unknown pneumonia in China and later declared a Public Health Emergency of International Concern the following month. The newly discovered global coronavirus, later called COVID-19, eventually impacted Hawaii. From March 26 through May 6, 2020, the State of Hawaii began a mandatory Stay-At-Home order and encouraged social distancing practices to prevent the spread of COVID-19. Although the Stay-At-Home order was lifted, the residents of Hawaii remain strongly encouraged to maintain social distancing practices and avoid large gatherings. In lieu of some in-person interviews, ASM Affiliates opted to hold telephone and video-conferencing conversations as alternative methods to the consultation process. The first interviews with Bobby Robinson, John DeSoto, and Jan Becket were conducted before the Stay-At-Home mandate, thus, ASM was able to physically meet with these individuals. Subsequent interviews with all four individuals were conducted in July and August and were thus conducted via phone.

It should be noted that some individuals and organizations prefer to meet in-person to share certain items and knowledge, particularly those pieces that are of particular importance to them and their ohana. This could consist of, but not be limited to: personal photos, archaeological sites, trails, gathering areas, etc. Due to COVID-19, that was not possible. The quality of information exchanged during the consultation for this project has been useful in identifying potential cultural impacts; however, not being able to meet in-person, which is the preferred method of consultation for a CIA, may have affected the quality of the information obtained, although this is not readily apparent.

As part of the interview process and with the consent of the interviewees, the interviews were audio recorded for note taking purposes only. Upon completion of the interview, an interview summary was prepared, which was emailed to the interviewees for review. Interviewees were asked to review the draft summary and make any necessary edits. With the approval of the interviewees, the finalized version of the summaries was compiled in a CIA report. The CIA report is not included with this EA in order to protect significant cultural sites by not disclosing their exact locations. The CIA report findings are summarized below.

3.4.1 Existing Condition

The Kawailoa plain, the location of the project area, has had a good amount of archaeological and cultural studies with findings spanning from pre-contact to early and late Historic eras. The current project area has been subject to two previous archaeological studies (Hammatt and Shideler 2012; Tulchin et al. 2012) and one recent study (Rechtman and Lauko 2020) (See Section 3.3.). Work has also been conducted mauka within the Kawailoa Ranch property that is owned by Kamehameha Schools, a native Hawaiian trust organization founded by Bernice Pauahi Bishop. Several archaeological/cultural sites have been identified in the vicinity of the current project area through both prior archaeological studies and consultation with Jan Becket, Robert "Bobby" Robinson, and John DeSoto.

The majority of archaeological and cultural studies conducted in Kawailoa focus on two areas: the western-end of the ahupuaa near Loko ea, Ukoa, and the Anahulu River, and to the north of the project area closer to Waimea Bay and valley where heiau such as Kupopolo, Ke Ahu o Hapuu, and Puu o Mahuka stand. Both ends of the ahupuaa have yielded a great deal of pre-contact findings indicating habitation and ceremonial/religious functions, respectively. Historic findings on both ends stem from the plantation era and military activities.

Prior cultural studies conducted within and in the vicinity of the current project area identified cultural concern for encountering burials in the sandy portions of the current project area. While no such sites were encountered during the subsurface testing that was conducted as part of the Rechtman and Lauko (2020) study, the area southward of Lauhulu Stream was identified to contain Jaucas sand. It is within such deposits that Halealoha Ayau, of the now dissolved Hui Malama I Na Kupuna O Hawaii Nei, has indicated iwi kupuna could be found. Mr. Robinson has suggested archaeological and cultural monitoring for all excavation activities.

While the background research and consultation process did not identify any ongoing traditional cultural practices within the current project area, several such practices do occur in the vicinity of the project area, including surfing, limu picking, subsistence fishing (including with a pole and throw net) and diving. Associated traditional aina cultural practices outside of the project area include heiau practices related to solstice/equinox and weather observations, huakai (trips) to archaeological/cultural sites, invasive vegetation removal and site maintenance, observation and education of native birds for navigation purposes, and the restoration and propagation of native plants.

Interviewees Bob Leinau and Kamaki Worthington were particularly concerned about Kahokuwelowelo Heiau and suggested a perimeter be drawn to preserve the area around it. Mr.

Worthington expressed concern with the concept of geotagging via social media, which could possibly bring unwanted visitors to the site. Although situated mauka, outside of the project area, Kahokuwelowelo Heiau is considered to be part of a larger cultural landscape that extends through the current project area to the shore. Past interviewees have suggested that the Cane Haul Road cut into Kahokuwelowelo destroying a large portion of the heiau which could extend further makai. Kamehameha Schools is the primary steward for Kahokuwelowelo Heiau and has been maintaining it for nearly 10 years. Kamehameha Schools has developed educational programming at the site with the University of Hawaii at Manoa (UH Manoa) as well as at the Kamehameha School Kapalama Campus, and has hosted numerous community meetings to develop restoration strategies in partnership with the community. Kamehameha Schools has worked with I Nui Ke Aho, a non-profit organization who cares for and conducts ceremonies at Kahokuwelowelo and KUPU to restore native plants at the site. The organization's leadership and collaboration has played an important role in continuing cultural practices and establishing a protective perimeter around Kahokuwelowelo Heiau.

Environmental concerns shared include sea level rise that erodes Laniakea Beach, which has also been associated with public safety, and the possible impact to the water table due to ground disturbance from the proposed project. The latter statement stems from knowledge of subterranean springs that flow from mauka to makai. It is recommended that special attention be paid during construction activities to limit impacts to the water table that could potentially affect the shoreline flow of fresh water and the growth of limu and the spawning of fish.

The proposed project will require HDOT to acquire land held since 1884 by the B. P. Bishop Trust Estate, a Native Hawaiian Organization whose mission it is to "…fulfill Pauahi's desire to create educational opportunities in perpetuity to improve the capability and well-being of people of Hawaiian ancestry" (Kamehameha Schools 2020). As such, any reduction to this estate – now Kamehameha Schools – directly impacts the trust and the organization's capacity to steward their land in accordance with Pauahi's will. Likewise, eliminating any portion of the estate's land impacts its resources and the trust's native Hawaiian beneficiaries.

3.4.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, no cultural properties would be affected.

No Build Settlement Alternative

Under the No Build Settlement Alternative, no cultural properties would be affected.

TSM Alternative

Under the TSM Alternative, no cultural properties would be affected.

Pedestrian Shift Alternative

As noted in Section 3.4.1, while no cultural resources were identified within the project area (with the exception of the T-1 described in Section 3.3), concerns for kupuna iwi, property acquisition, and the environment were raised.

3.4.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

HDOT has agreed to conduct archaeological monitoring. An archaeological monitoring plan will be prepared in accordance with HAR §13-279-4 and submitted to the SHPD for review and acceptance prior to initiating any ground-disturbing activity. If iwi kupuna are discovered during construction, all work shall be halted, the SHPD shall be contacted, and treatment of the site shall be conducted in accordance with HAR §13-300.

To minimize property acquisition, the current footprint of the proposed development area was significantly reduced as a result of consultation with the current Kamehameha Schools' lessee and community members. HDOT will continue to coordinate with Kamehameha Schools and affected lessees as design progresses.

3.5 Biological Resources

3.5.1 Existing Condition

A field survey was conducted by LeGrande Biological Surveys, Inc. and Pacific Rim Conservation in October 2019, August 2020, and March 2021. The Terrestrial, Vegetation, and Wildlife Survey is included in Appendix E.

Much of the project area is dominated by an overgrown forest of invasive tree species with a weedy understory. The species are consistent throughout this vegetation type with the dominant tree species including, koa haole (*Leucaena leucocephala*), autograph (*Clusia rosea*), monkeypod (*Samanea saman*), kiawe (*Prosopis pallida*), Chinese banyan (*Ficus macrocarpa*), Java plum (*Syzgium cumini*), and Christmas berry (*Schinus terebinthifolius*). Some mauka areas along the alignment are utilized for ungulate (horse and cow) pastures. These areas are dominated by grassy pastures for foraging or sections of bare dirt and trees scattered in or around the edges of the pastures.

Plant and wildlife habitats along the proposed alignment have been highly modified by human activities, including the intentional and accidental introduction of alien species. Indian mongooses (*Herpestes a. aurpunctatu*s) and feral cats (*Felis catus*) are common throughout the project area. Although not observed during the survey, there are also likely to be numerous rats (*Rattus exulans hawaiiensis,* and *Rattus norvegicus*) and mice (*Mus domesticus*).

Most of the bird species observed within the subject property are introduced. Indigenous bird species include the migratory shorebirds, the Pacific Golden Plover (*Pluvialis fulva*), and the Ruddy Turnstone (*Arenaria interpres*). Other common birds in the area are cattle egrets (*Bubulcus ibis*), doves (*Geopelia striata*), Japanese white eye (*Zosterops japonicas*), mynas (*Acridotheres tritis*), and bulbuls (*Pycnonotus jocosus*).

The endemic Hawaiian short-eared owl or *pueo* (*Asio flammeus sandwichensis*) was not observed nor is it known to occur in the area. It is listed as endangered by the State of Hawaii on the island of Oahu. *Pueo* occupy a variety of habitats and are most common in open habitats including grasslands and shrublands, often in urban areas. It is a ground nesting species, and thus sensitive to land clearing activities.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*), which is listed as endangered by the U.S. Fish and Wildlife Service and the State of Hawaii, is known to occur nearby and could forage or roost in the project area. Hawaiian hoary bats roosts during the day in native and alien trees and other woody vegetation. During the bat breeding season (June through September), young bats may be left unattended in nursery trees while the adults are out foraging.

Although the project area does not provide suitable habitat for seabirds that are listed as threatened or endangered for protection under Section 7 of the Endangered Species Act, they may fly over the project area. Seabirds include the Wedge-tailed shearwater (*Puffinus pacificus*), also known as Uau Kani, the endangered Hawaiian Petrel (*Pterodrama sandwichesis*) and the threatened Newell's Shearwater (*Puffinus auricularis newelli*). The Wedge-tailed Shearwater is known to nest in the makai portion of the proposed Kawailoa Beach Park (City, 2005b).

No endangered water birds were observed during the field survey, and no wetland habitat was found that would be suitable for water birds.

Much of the coastline along the project area is dominated either by Laniakea Beach or by residential houses and yards planted with ornamental landscaping. A basalt rock headland divides the coastline and provides a sheltered cove used by Hawaiian Green Sea Turtles (*Chelonia mydas*) as a grazing area. The cove has become known as "Turtle Beach" and is a popular destination for tourists to observe the endangered species closely. The Hawaiian Green Sea Turtle or Honu is known to frequent the shoreline near Laniakea Beach and neighboring coastal strands, foraging on near shore reefs and resting on the sandy beaches. When Hawaii Tourism Authority funded Malama Na Honu, it became the official turtle viewing spot. The Hawksbill Sea Turtle (*Eretmochelys imbricate*) may also occur in the vicinity of the project site. Artificial lighting is an issue for sea turtles.

Hawaiian Monk Seals (*Monachus schauinslandi*) are also known to frequent the shoreline. The Hawaiian monk seal, is an endangered species of earless seal in the family *Phocidae* that is endemic to the Hawaiian Islands. They are primarily marine animals but haul out on land to rest and give birth.

The National Wetland Inventory (NWI) (2020) has mapped wetlands within the Lauhulu Stream (also referred to as Laniakea Stream/Kukaiohiki Gulch) vicinity of the proposed realignment (see Section 3.6). The stream channel itself is intermittent and appears to have water flow only during heavy rain events. Additionally, an area to the west of the stream is mapped as an estuarine and marine wetland by the NWI, but no evidence of standing water was observed to the west of the intermittent stream during the site survey. No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during the site survey.

3.5.2 Potential Impacts

No Build Alternative

The No Build Alternative would not result in any new impacts to biological resources. Landscaping, which includes trimming grass and trimming trees as necessary to maintain safe highway operation, would continue to be maintained as it is now.

Tourists would continue to access the beach to observe and photograph the green sea turtles. The existing parking area on the mauka side of the road would remain barren ground that is susceptible to erosion.

No Build Settlement Alternative

The No Build Settlement Alternative would not result in any new impacts to biological resources. Landscaping, which includes trimming grass and trimming trees as necessary to maintain safe highway operation, would continue to be maintained as it is now.

The existing parking area on the mauka side of the road would remain barren ground that is susceptible to erosion. Vehicles parking in the area would contribute to the erosion and lack of vegetation.

TSM Alternative

The TSM Alternative would not result in any new impacts to biological resources. Landscaping, which includes trimming grass and trimming trees as necessary to maintain safe highway operation, would continue to be maintained as it is now.

The current barren parking area on the mauka side of the road would regrow and be less susceptible to erosion.

Pedestrian Shift Alternative

The proposed roadway realignment is not likely to have any detrimental effects on the plant and wildlife resources of the area. Plant and wildlife habitats along the proposed alignment have already been highly modified by human activities. Much of the plant and bird species observed within the subject property are introduced. The proposed project would allow the plants on the mauka side of the Highway to regrow as cars would no longer be parking in the area. On the makai side of the project area, one lane of the existing Kamehameha Highway will be removed and landscaped, which will promote long-term restoration of the beach ecosystem, resulting in beneficial impacts to wildlife.

The proposed roadway realignment is not likely to have an adverse effect on the avian resources of the area. None of the bird species observed in 2014, 2019, 2020 or 2021 at the proposed project are listed as endangered or threatened. The Pacific Golden Plover and Ruddy Turnstone are protected by the Migratory Bird Treaty Act, but they do not nest in Hawaii and are adaptable in their habitat use during the winter months, foraging and resting in a variety of open habitats, including pastures, grassy fields, lawns, beaches, and shorelines.

3.5.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

As shown in Figure 2-7, part of the existing pavement for Kamehameha Highway will be removed and naturalized. Landscaping plans will be developed during final design. Areas that are disturbed during construction will be restored.

Street lights will be on poles every 120 feet and will be designed to employ flat lens fixtures are designed to reduce glare and shield light from migrating birds and sea turtles. These lights will replace existing lights and they will be further from the shoreline and therefore even less likely to disturb turtles.

As discussed in Section 3.16 on construction impacts, nighttime construction lighting will be limited when possible to protect seabirds, hoary bats, and sea turtles.

3.6 Surface Water Resources

3.6.1 Existing Condition

Laniakea Beach is well known for sea turtles and surf spots. Puu Nenue is a broad basalt headland that borders the north end of Laniakea Beach, and Puu Kolea is a broad sand point at the south end. The offshore area is known for high quality surf, with numerous well-known surf breaks including Jocko’s, Hultin’s, Laniakea’s, and Himalaya’s (Figure 3-8).

Figure 3-8. Laniakea Beach Surf Spots

Lauhulu Stream (also referred to as Laniakea Stream or Kukaiohiki Gulch) is an intermittent stream running through the project area roughly east to west: Lauhulu Stream empties at Laniakea Beach and the streambed is fairly shallow throughout the project area. The bridge overpass near the beach is mainly bare sand (Figure 3-9). The upper reaches of the stream are generally dry unless there are heavy rains and then the stream flows rapidly to the beach. There is periodically standing water on the mauka side of the Highway in the streambed after a storm.

Figure 3-9. Existing Bridge Over Lauhulu Stream (Also Referred to as Laniakea Stream or Kukaiohiki Gulch)

The National Wetland Inventory (NWI) (2020) has mapped wetlands within the Lauhulu Stream vicinity of the proposed realignment (Figure 3-10). The stream channel itself is intermittent and appears to have water flow only during heavy rain events. Additionally, an area to the west of the stream is mapped as an estuarine and marine wetland by the NWI, but no evidence of standing water was observed to the west of the intermittent stream during site surveys in March 2021 (Appendix E and Section 4.2.2). No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during site surveys and no wetland soils were present. Preliminary investigations and a wetland delineation conducted in accordance with the *U.S. Army Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and the Pacific Islands (version 2.0)* indicate that there are no wetlands present within the project footprint or study area. A jurisdictional determination has been prepared (Appendix L) and coordination with the U.S. Army Corps of Engineers is ongoing.

While Laniakea Beach is on the DOH's 303d list of impaired waterways, no specific parameters are listed. Laniakea Stream/Kukaiohiki Gulch/ Lauhulu Stream are not on the 303d list.

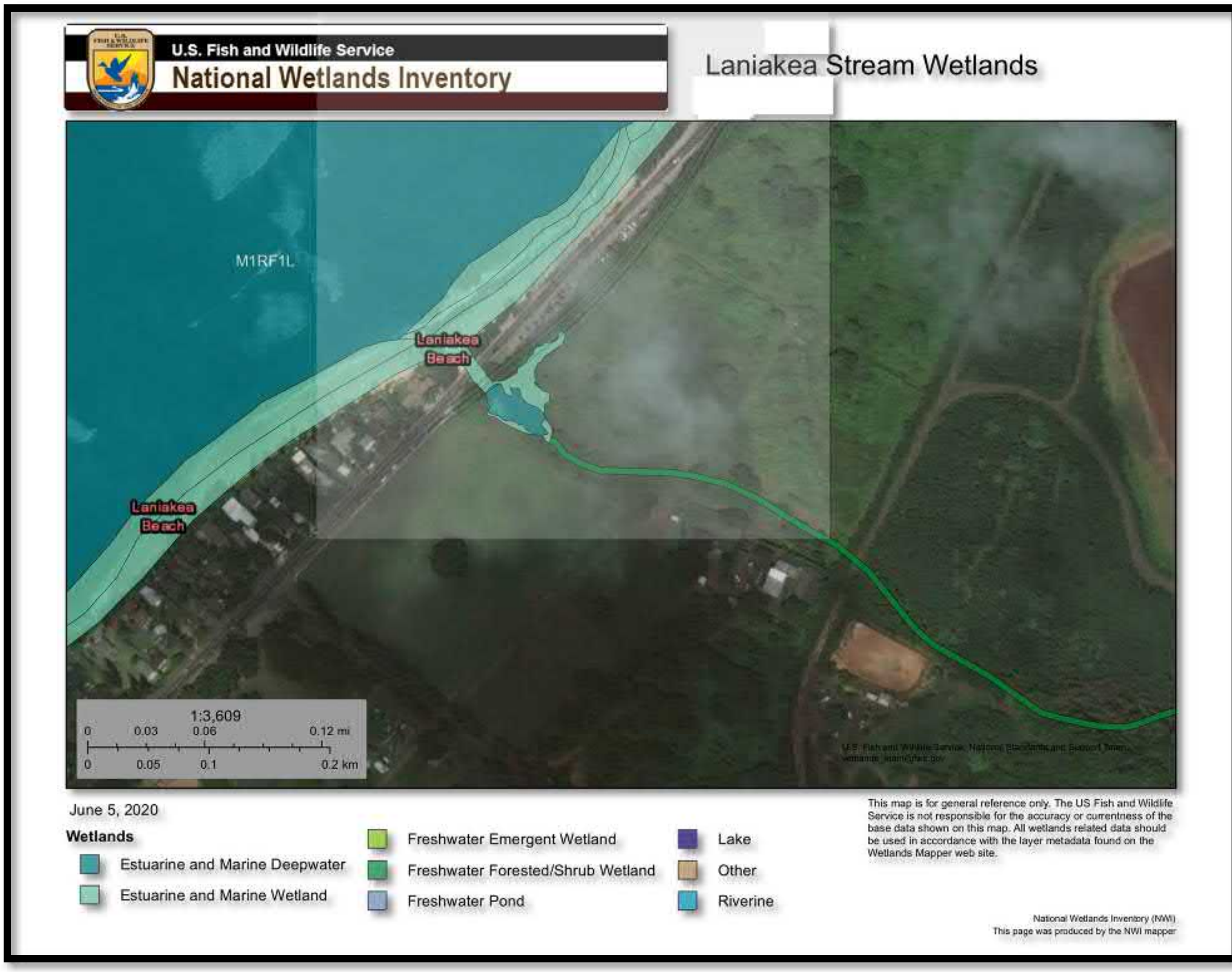


Figure 3-10. National Wetlands Inventory – Lauhulu Stream Wetlands

3.6.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, no new impacts to water resources would occur.

No Build Settlement Alternative

Under the No Build Settlement Alternative, no new impacts to water resources would occur.

TSM Alternative

Under the TSM Alternative, no new impacts to water resources would occur. The current barren parking area on the mauka side of the road would regrow and be less susceptible to erosion.

Pedestrian Shift Alternative

For the proposed project, one new bridge over Lauhulu Stream will be required. The new crossing is located close to the existing bridge on Kamehameha Highway. The old bridge is 64 feet long and has a center pier (refer to Figure 3-9). The proposed bridge will be 100 feet long and have no central pier. The new bridge is at an angle to the old bridge because the new highway is curving inland. At their closest point, the two bridges will be approximately 15 feet apart, railing to railing, although this may change slightly during final design.

The new bridge span is short enough as to not require abutments or other structures in the stream beds or any potential adjacent wetlands. Permits related to structures in streams by the Army Corps of Engineers (USACE) and Section 404 of the Clean Water Act will not be required.

The new bridge over Lauhulu Stream will maintain the existing roadway vertical profile. The proposed bridge is sized to have greater flow conveyance capacity than the existing bridge (Appendix F).

Preliminary investigations and a wetland delineation (Appendix L) indicate that there are no wetlands present within the project footprint or study area. Coordination with the U.S. Army Corps of Engineers is ongoing.

With the construction of the new road, more stormwater will be generated from the impervious road surface. However, the amount of exiting impervious surface would be lower when one lane of the current Kamehameha Highway is removed.

3.6.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

Coordination with the USACE is being conducted in accordance with Section 404 of the Clean Water Act. The design for the new bridge will not require any permanent structural components be placed in the stream. HDOT will require, in the bid documents, that all contractors clearly illustrate how they would achieve the work without placing materials in the stream in their proposal. Keeping piers and abutments out of the stream and requiring the contractor to keep all their equipment and materials out of the stream will eliminate the need for a Section 404 Department of the Army (DA) permit.

By sizing the proposed bridge to have greater flow conveyance capacity than the existing bridge, no new flooding will be caused by the new bridge. Conveyance capacity for both bridges may require excavating the sand deposits downstream. A maintenance plan will be developed to ensure sand is cleared after storm surges.

The project will also implement the permanent Best Management Practice (BMP) of vegetated swales along the mauka side of the existing road to carry stormwater and to allow infiltration as seen on the cross section shown in Figure 2-6 (See also Appendix G).

3.7 Parks and Recreational Resources

3.7.1 Existing Condition

The project area is popular and highly visited due to the scenic beauty of the region, natural resources attractions, beaches, and surf. Within the project area is Laniakea Beach, well noted for the sea turtles that feed nearby and come to rest on the sand. As described in Section 3.6.1, Chun's Reef and multiple surf spots also lie within the project area and attracts surfers. Access to Laniakea Beach is very important for locals and tourists alike and is central to HRS Chapter 205, Coastal Zone Management (See Section 3.17).

Two potential beach parks were studied by the City's DPR: the "Laniakea Beach Support Park" near Laniakea Beach and "Kawailoa Beach Park" near Chun's Reef). Figure 3-11 shows the parcels acquired by the City's DPR for potential beach park development. However, the City's DPR has advised HDOT in a meeting on October 11, 2019 that it does not plan to move forward with either park development at this time.

Figure 3-11. Proposed City and County of Honolulu Parks

3.7.2 Potential Impacts

No Build Alternative

The No Build Alternative would not impact current recreational uses in the area or the City DPR's planned parks. Nothing related to parks and recreational resources would change. Residents and tourists would continue to cross the Highway to access Laniakea Beach.

No Build Settlement Alternative

The No Build Settlement Alternative provides sanctioned parking for Laniakea Beach. Given the existing usage of the same parking area on the mauka side of the Highway, visitation to these recreational sites is anticipated to remain largely the same. There may be a slight increase in visitation, by both tourists and locals alike, as parking access and pedestrian safety is enhanced with barriers and crosswalks.

TSM Alternative

The TSM Alternative would not impact the City DPR's ability to implement the parks in the future.

Pedestrian Shift Alternative

For the Pedestrian Shift Alternative, recreational access will continue at Laniakea Beach with the provision of access to parking on the makai side of the Highway. The walk to the beach from the parking area will be safer and easier, especially for families and those with disabilities.

The Pedestrian Shift Alternative was designed recognizing the City DPR's potential future park use. This Alternative will not preclude the City DPR from developing a formal parking area or beach support amenities.

As discussed in Section 3.16.4, Laniakea Beach will remain open and accessible to the public throughout the duration of construction. Public access to City DPR's parking area will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months.

3.7.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

Shifting the Kamehameha Highway mauka will support ready access to Laniakea Beach and its recreational resources by removing the conflicts between the Highway and those wishing to access the beach. As noted in the previous section, parking for access to Laniakea Beach may be temporarily limited for up to 24 months while the improvements are constructed.

3.8 Visual and Aesthetic Resources

3.8.1 Regulatory Requirements

The project will not use federal funding and will not be required to complete FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015). However, these guidelines, referred to as the "FHWA guidelines," are a broadly accepted approach to analyzing visual impacts, particularly for transportation projects. The FHWA guidelines use changes in visual character and viewer group sensitivity to assess changes in visual quality. The Visual Impact Assessment prepared for this project is provided in Appendix H. Results of the study are summarized in the remainder of this section.

3.8.2 Existing Condition

Areas of ranch land on the coastal plain on the mauka side of the Highway, particularly in the vicinity of the proposed project, offer open views south and east of the Highway toward the bluffs and are characterized by pasture, fencing, and areas of common coastal vegetation (Figure 3-12). Land cover, such as human-made structures, exist but are dispersed and generally not visible from the Highway.

Figure 3-12. Typical Existing Mauka Side View from Kamehameha Highway in the Project Area

Periodic scenic beach and open ocean views are available on the makai side of the Highway, including views at Laniakea Beach, which lies within the project limits (Figure 3-13). A portion of Kamehameha Highway in the project area gives drivers their first glimpse of the ocean as they approach the North Shore. The ocean is very close to the Highway and the view is stunningly beautiful. The view of Laniakea Beach, with its turtles, surf, and sand, draws in both residents and visitors alike.

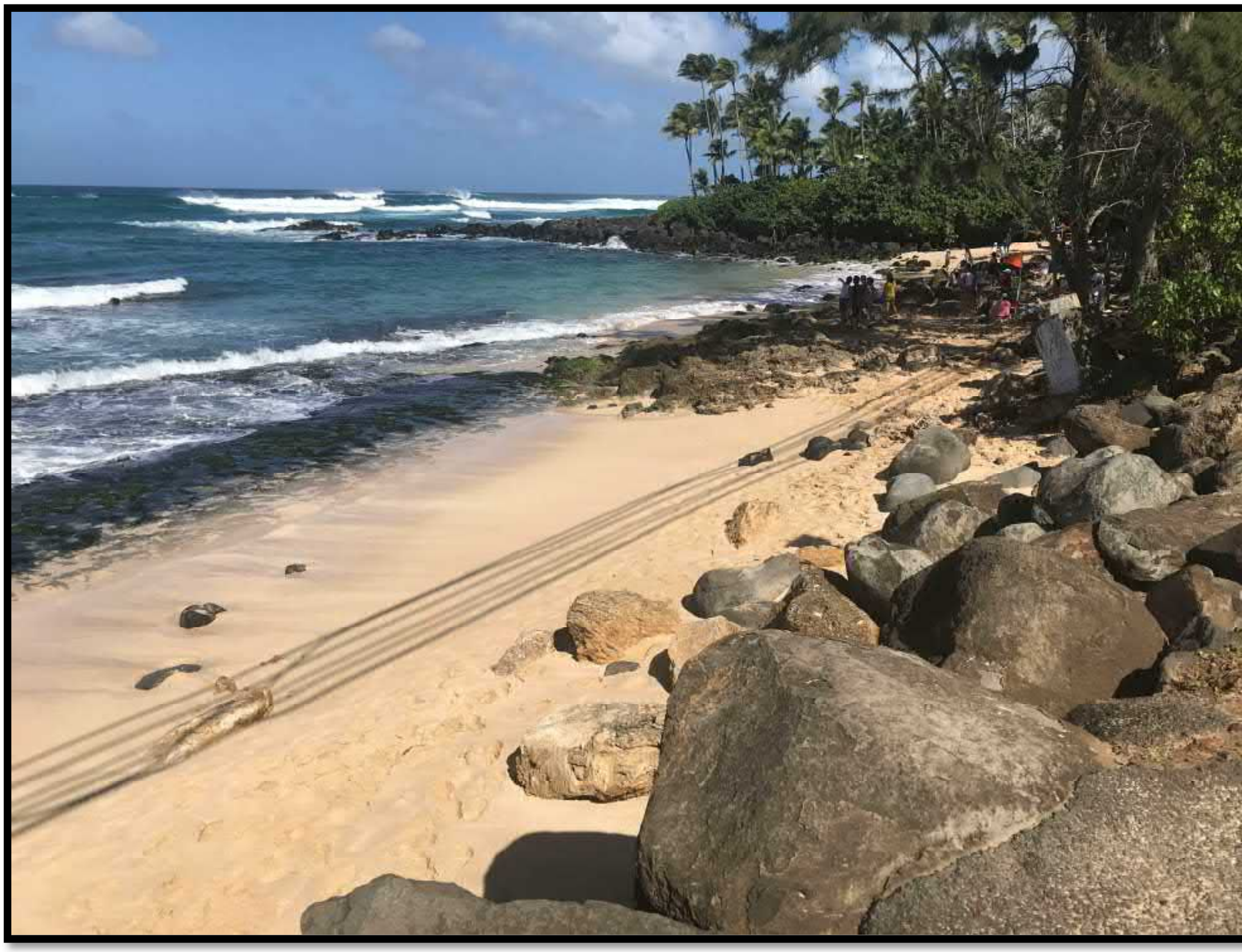


Figure 3-13. Typical Existing Makai Side View from Kamehameha Highway in the Project Area

Generally, however, the makai side of the Highway is characterized by human-made features and existing vegetation. Human-made features consist of one or two-story residential building structures with open and opaque fencing and gates of varying materials. These structures are typified by wood/vinyl siding, stucco, natural stone veneers, concrete, metal, glass, and bright colors.

Indoor and outdoor electrical lighting is commonly visible from the highway corridor. Overhead utility lines are common within the highway corridor and can be on both the makai and the mauka sides of the Highway. Figure 3-13 shows the shadow of utility lines on the beach itself.

A culturally sensitive site lies north and east of the project site along Kamehameha Highway. It is located on bluffs above the Highway and overlooks Laniakea Beach. It has views extending both north and south into the middle and background distance zones; however, most views of the Highway and human-made residential and commercial structures from the site are obscured by vegetation and the gently rolling terrain.

3.8.3 Potential Impacts

No Build Alternative

Under the No Build Alternative, there will be no changed proposed to the roadway and no impact to the scenic resources in the project area.

No Build Settlement Alternative

Under the No Build Settlement Alternative, barriers are placed mauka of the Highway. Additionally, the currently disturbed areas behind the proposed guardrail remain barren of vegetation in areas where cars drive and park.

Viewer exposure and awareness will not change, and visual conditions for highway travelers, pedestrians, bicyclists, and neighbors are the same as the No Build. The view from the No Build Settlement Alternative will continue to be available for those on the roadway and tempt drivers to slow down to enjoy seeing Laniakea Beach. However, as crosswalks will funnel pedestrians to cross at specific areas, drivers will not be as distracted by pedestrians crossing the Highway haphazardly.

TSM Alternative

Under the TSM Alternative, no change is proposed to the form or material of the roadway, and guardrail is a common material within the Kamehameha Highway corridor. Additionally, the currently disturbed areas behind the proposed guardrail would regrow vegetation in areas where cars used to park making the mauka roadside more attractive.

Viewer exposure and awareness will not change, and visual conditions for highway travelers, pedestrians, bicyclists, and neighbors would remain the same. The view from the TSM Alternative would continue to be available for those on the roadway and tempt drivers to slow down to enjoy seeing Laniakea Beach.

Pedestrian Shift Alternative

All new roadway and auxiliary features are common visual elements within the existing Kamehameha Highway corridor and will be compatible with the existing visual environment.

Moving the Highway 80 feet to the mauka side of the Highway will displace some of the vegetation at the edge of the existing ranchland; however, this vegetation is not in a natural condition. The makai half of the existing roadway will be demolished and rock and vegetation, and slope stabilization measures will be placed to prevent soil and beach erosion and add natural visual elements between the beach and proposed roadway. Revegetation and replanting efforts on both sides of the proposed roadway will provide erosion control and visual screening for neighbors, including viewers from the mauka cultural site.

No residential structures, fencing, or other human-made elements will be impacted. Driveways to the existing residences on the Haleiwa side of the stream will be extended to the proposed highway pavement. The makai side of the existing Kamehameha Highway pavement will be naturalized, which may provide visual screening and buffering for the residential viewers. The resulting changes would provide beneficial effects to the natural environment for most viewers.

The mauka side of the existing road and the existing bridge will remain as separate pedestrian and bicycle facilities. This will allow these travelers to shift focus and attention from roadways and vehicular conflicts to the scenic natural features. Pedestrians and cyclists will have an excellent view from the repurposed highway.

While most visual elements associated with the realigned road are existing in the highway corridor, the size and scale of widened road, refuge median, guardrails, and other ancillary elements may impose slight effects to motorists and residential neighbors; however, the human and project environments will be orderly and coherent for neighbors and travelers.

Views from the Pedestrian Shift Alternative may still tempt drivers to slow down to enjoy the stunning sight of Laniakea Beach. The informal parking on the makai side will block some of the coastal view from the Highway. However, with installation of barriers on the mauka side to prevent parking, pedestrians will not be crossing the Highway and distracting drivers.

Views of the project from the mauka cultural site will be obscured by existing vegetation. Landforms and existing vegetation will likely obscure all views of the project site for pedestrian travelers to the cultural site. Relocated utility poles and streetlights may be visible above the tops of existing trees and shrubs. Light spill from streetlights may be visible from the cultural site in nighttime conditions; however, these are existing visual elements and new lights will be full cutoff or shielded to reduce glare during nighttime hours.

3.8.4 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No mitigation is proposed for the TSM Alternative, because there would be little to no change to the form or material of the roadway, little to no impacts to the scenic resources in the project area, and viewer exposure, awareness, and visual conditions would not change.

Pedestrian Shift Alternative

As described above, additional landscaping will be determined during final design along the sides of the realigned highway to mitigate potential changes to visual conditions. Light spill from streetlights may be visible from the cultural site in nighttime conditions; however, these are existing visual elements and new lights could be shielded to reduce glare during nighttime hours.

3.9 Roadways and Traffic

Details regarding Kamehameha Highway traffic conditions and the analyses performed to support the analysis of the alternatives are provided in the Traffic Evaluation included in Appendix B. This section summarizes that report.

3.9.1 Existing Condition

Within the study area, Kamehameha Highway is a two-lane, principal arterial. Despite being classified as such, the roadway's mobility can be compromised by beach-related vehicle and pedestrian traffic, most notably at Laniakea Beach. In addition, residential direct driveway access is provided on one or both sides of Kamehameha Highway for most of the area between Haleiwa and Waimea. The posted speed limit in the vicinity of Laniakea Beach is 35 miles per hour. There are two bus stops in the project area. Parking spaces are designated for lifeguards.

Traffic congestion is an issue at Laniakea Beach, as the beach is a popular tourist attraction. Long delays are regularly reported by residents. The popularity of the site for both turtle watching and surfing is such that the movement of vehicles in and out of parking, and the number of pedestrians crossing the road in an uncontrolled manner, causes the traffic to slow considerably. There are approximately 50-60 informal parking places on the mauka side of the road. Motorists park on the mauka side of Kamehameha Highway and cross the Highway to observe sea turtles. Vehicular turning movements to and from the Kamehameha Highway combined with the frequent shuttles and the random pedestrian crossing further complicate traffic operation and safety on this segment of Kamehameha Highway. Vehicles are commonly blocked all the way to Haleiwa town.

As described in the Traffic Evaluation (Appendix B), pedestrian and vehicle data were collected several times over multiple years to analyze the impacts of both the previous barrier and to evaluate the proposed project.

3.9.2 Potential Impacts

No Build Alternative

Safety would not be improved as parking on the mauka side of the Highway would continue and people would continue to cross the Highway randomly to go to Laniakea Beach. Kamehameha Highway would continue to be congested and major slowdowns would occur as they do now.

No Build Settlement Alternative

From a traffic operations perspective, Kamehameha Highway through traffic would be able to pass through the area with fewer vehicular and pedestrian conflicts, improving mobility along the corridor. When the concrete barriers were previously installed in a similar fashion as the barriers under the No Build Settlement Alternative, travel times were improved by 10-15 minutes in the Waimea-bound direction on Saturday afternoons. The crosswalks that are part of the No Build Settlement Alternative may help with safety if pedestrians use them.

While the installation of barriers at Laniakea Beach appears to be effective as a short-term or interim solution, improving Kamehameha Highway traffic flow through the area is not the only objective of the project.

TSM Alternative

As demonstrated by the concrete barriers previously placed and then removed from the mauka side of Kamehameha Highway, through traffic would be able to pass through the area with fewer vehicular and pedestrian conflicts, improving mobility along the corridor. When the barriers were previously installed, travel times were improved by 10-15 minutes in the Waimea-bound direction on Saturday afternoons.

Pedestrian Shift Alternative

The Pedestrian Shift Alternative will improve traffic congestion. Once constructed, cars will park on the makai side of the road to access the beach. Under the Pedestrian Shift Alternative there will still be space to accommodate approximately 50-60 passenger cars in an open, dirt lot. Adequate parking spaces will be designated for lifeguards. The Pedestrian Shift Alternative will provide a median storage lane to allow vehicles to queue while waiting for gaps in Haleiwa-bound traffic and to act as a refuge lane for exiting traffic. The bus stops will be relocated as needed and brought into compliance with Americans with Disabilities Act Accessibility Guidelines. Retaining the bus stops will help reduce individual vehicles parking when they visit the beach and reduce congestion on the Highway.

3.9.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

The proposed project is itself a mitigation measure for the dangerous pedestrian conditions and current traffic congestion in the area. Because the traffic impacts are anticipated to be beneficial in nature, no mitigation is proposed.

3.10 Pedestrian Safety

3.10.1 Existing Condition

Pedestrians cross Kamehameha Highway after parking on the mauka side of the road. The area where people park is a favorite along Kamehameha Highway as the beach and coastal waters are very close to the Highway and are easily accessible to the public within a few short footsteps. The open parking area has been used in excess of fifty years by a variety of beach users, turtle viewers, surfers, kayak paddlers, stand-up paddle (SUP) boarders, and swimmers. It is utilized as a much-needed parking area and recreational equipment unloading area for these users and is integral to their coastal access.

The Traffic Evaluation (Appendix B) documents as many as 338 pedestrians crossing the road during a single hour on a Saturday afternoon. The pedestrians are often focused on the scenery and are rushing to see the turtles on the beach. Many of the cars on the road belong to other tourists who are distracted by the view of the beach. Based on the discussion at Task Force meetings, most of the local motorists are polite and let the tourists cross the road. However, as the area gets congested and the tourists dart between the cars, it is likely an accident could occur. In August 2019 a child crossing the Highway was hit by a car, and HDOT changed the focus of the project being proposed at Laniakea.

3.10.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, no changes to safety conditions would occur. People would continue to park on the mauka side of the road and randomly cross through the traffic

No Build Settlement Alternative

Under the No Build Settlement Alternative, changes to safety conditions would occur. People would continue to park on the mauka side of the road, but they could cross traffic at two crosswalks. Cars would have one entrance into the parking area and one exit. Accidents, like the one in August 2019 where a child was hit by a car, may continue, but will likely be reduced due to the installation of crosswalks.

TSM Alternative

Parking would be eliminated on the mauka side of the Highway greatly reducing the number of pedestrians crossing the Highway. This Alternative would limit people from reaching the beach easily and may move the pedestrians to other parts of the Highway if they can find additional parking. As with the concrete barriers installed in December 2013 which blocked off parking on the mauka side of the road, the TSM Alternative could create a hazardous situation where pedestrian beachgoers are forced to walk along the narrow highway shoulder for long distances pushing strollers, rolling wheelchairs, and carrying beach chairs, umbrellas coolers, surfboards, kayaks, and SUP and windsurfing boards and equipment. This could increase the danger to pedestrians and stretch that danger out over a longer distance.

Pedestrian Shift Alternative

The Pedestrian Shift Alternative will allow cars to park makai site of Kamehameha Highway so that pedestrians will not have to cross it to get to the beach. A refuge lane between the travel lanes will allow vehicles to wait safely before turning. Drivers may still become distracted by the ocean view with the Pedestrian Shift Alternative, but pedestrians will no longer be vulnerable.

Vehicles may still attempt to bypass bottlenecks, but the storage lane will minimize this circumstance, and vehicles will have more space to maneuver.

3.10.3 Avoidance, Minimization, and Mitigation Measures

When compared against The No Build and The No Build Settlement, the TSM and Pedestrian Shift Alternatives mitigate the safety concerns for pedestrians to different extents.

Under the TSM Alternative, people would be prevented from parking on the mauka side of the Highway which would eliminate or reduce pedestrian crossings within the TSM limits. While the No Build Alternative would allow for random crossings, the No Build Settlement would funnel pedestrians across at crosswalks. Despite the streamlined access anticipated under the No Build Settlement, accidents may still happen, especially if the crosswalks are ignored by pedestrians. For these reasons, the TSM Alternative provides slightly safer conditions for pedestrians than the No Build but is not likely considered an improvement for pedestrian safety when viewed against the No Build Settlement Alternative.

The Pedestrian Shift Alternative moves the parking to the other side of the Highway, eliminating the pedestrians running across the road to get to the beach. Because the traffic impacts are anticipated to be beneficial in nature, no mitigation is proposed for the TSM and Pedestrian Shift Alternatives.

3.11 Public Facilities and Services

3.11.1 Existing Condition

Homes in the project area are served by water, electricity, sewers and telephone/cable lines. Electricity and telephone/cable lines are on poles that also provide highway lighting, and Spectrum has their aerial CATV system attached to both Hawaiian Telcom and Hawaiian Electric Company (HECO) poles.

The City & County of Honolulu's Ocean Safety Division maintains one lifeguard tower at Laniakea Beach and supports the immediate and surrounding area with mobile response teams (using trucks, jet skis, and all-terrain vehicles). Parking places are designated for the lifeguards. There is a consistent threat to public safety because of surfing, swimming, paddling, and fishing accidents, as well as vehicle/pedestrian accidents. The nearest ambulance is at the Waialua Fire Station roughly three (3) miles away, so lifeguards are frequently the first of first responders on scene at any incident near the site of the proposed project. Traffic congestion can hinder the passage of emergency vehicles to the scene. Cars parked on the shoulder prevent cars traveling in the roadway from pulling off to let emergency vehicles pass.

3.11.2 Potential Impacts

No Build Alternative

No changes to utilities serving the area will be made.

Traffic congestion will continue to hinder the passage of emergency vehicles and cars parked on the shoulder will prevent cars traveling in the roadway from pulling off to let the emergency vehicles pass. Additionally, the Highway will remain vulnerable to periodic high surf events.

No Build Settlement Alternative

No changes to utilities serving the area will be made.

The No Build Settlement Alternative is anticipated to experience less congestion than the No Build Alternative. Improved traffic flow during peak hours assumed under this condition will allow vehicles to move over to more effectively accommodate passage of emergency vehicles. However, the issue of cars not having much room to pull over to let emergency vehicles pass will remain due to the mauka guardrail used to control parking. Like the No Build, the Highway will remain vulnerable to periodic high surf events.

TSM Alternative

No changes to utilities serving the area will be made.

As demonstrated by the concrete barriers previously installed by HDOT to prevent parking, the TSM Alternative would reduce congestion (See Section 3.9). Improved traffic flow during peak hours as a result of implementing the proposed project would allow vehicles to move over to more effectively accommodate passage of emergency vehicles. Cars are still likely to park along the makai side.

Because the TSM Alternative would improve traffic flow, it is anticipated to improve emergency response times over the No Build Condition and No Build Settlement.

Pedestrian Shift Alternative

Water meters, utility poles and sewer manholes will remain accessible for maintenance along the currently existing highway. New poles for lighting will be installed every 120 feet along the new highway alignment.

Overall, the Pedestrian Shift Alternative will reduce congestion and allow easier passage of emergency vehicles. Improved traffic flow during peak hours as a result of implementing the proposed project will allow vehicles to move over to more effectively accommodate passage of emergency vehicles than in the No Build, No Build Settlement, and TSM Alternatives. Furthermore, moving the Highway inland will keep it open during high surf, which is not addressed by the TSM Alternative.

3.11.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No avoidance, minimization, or mitigation measures to public facilities and services would be needed for this Alternative. However, it should be reiterated that this Alternative does not address the roadway's reliability.

Pedestrian Alternative

The Pedestrian Shift Alternative involves creating access controls at Pohaku Loa Way to prevent the private road from being used as overflow parking for beach access, as well as to discourage inadvertent motorized uses of the shared-use path. HDOT will coordinate with the City and County of Honolulu Police, Fire, and Emergency Medical Services to ensure that any access concerns are fully addressed.

3.12 Noise

FHWA has established the Noise Abatement Criteria (NAC), for different exterior and interior land use activities which have been adopted by the State of Hawaii as its standard. The NAC do not constitute legally enforceable noise standards but represent a yardstick for evaluating the effect of project noise on the surrounding community.

Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels. "Approach" means 1 dBA or less than the NAC, and "substantially exceed the existing noise levels" means an increase of at least 15 dBA. If the NAC are approached or exceeded, or if there is a substantial increase above the existing noise level, noise abatement measures must be considered.

Changes in traffic noise are assessed using human perceptions of sound level changes. Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, but a change of 10 dBA is perceived as a doubling (or halving for a decrease) of noise levels.

A traffic noise study was performed for this project and documented in the Noise Impact Assessment in Appendix J. This section summarizes the study methods and findings.

3.12.1 Existing Condition

Existing and future noise sensitive land uses and activities adjacent to the Kamehameha Highway Pedestrian Safety Project and nearby major roadways were identified from site inspections and existing land use mapping. Land uses closest to the project area include residences, ranching and agricultural land, and undeveloped land.

The ambient noise environment in the vicinity of the Kamehameha Highway Pedestrian Safety Project is comprised of several noise sources including vehicular traffic traveling on the Highway itself. Other noise sources that are typically audible in the area include landscaping, wildlife, and neighborhood pets. Atmospheric conditions also influence noise levels in the area with variable ocean tides and wind patterns.

At the time of this report, no complaints from the community are on file at HDOT relating to traffic noise along this area of Kamehameha Highway or about experiencing louder nighttime traffic noise levels than during daytime hours. Site observations indicated that short-term measurement periods provided sufficient traffic noise levels with free-flow traffic conditions for noise model validation to support prediction of worst-hour, or loudest hour, traffic noise levels.

To determine the existing worst-hour traffic noise levels, traffic data was used for Existing Year 2015 developed in the traffic analysis for the Kamehameha Highway Realignment (WSP USA, 2020). Input variables to noise modeling and analysis include traffic volumes, speeds, and vehicle fleet mix (auto, medium truck, and heavy truck percentages).

3.12.2 Noise Measurement Sites

Short-term (15 to 30 minutes) and long-term (24 hours) measurements were taken at six locations along the project study area to describe the existing noise environment. Field measurements offer a baseline for establishing existing ambient noise levels in the area and are used for estimating future noise levels by adding ambient levels to other noise levels generated by the proposed project.

3.12.3 Potential Impacts

No Build Alternative

Predicted 2030 worst-hour traffic noise levels without the proposed project would range from 45 dBA to 67 dBA with an increase of 1 to 2 dBA at each modeled site over existing noise levels due to increased traffic volumes along the existing alignment in the year 2030. These levels would approach or exceed the NAC at 15 modeled sites located adjacent to and makai of Kamehameha Highway representing 13 residences, Laniakea Beach and Chun's Reef. Figure 3-14 shows the modeled noise-sensitive receptor sites. Locations where the levels would exceed or approach the NAC are shown in red.

No Build Settlement Alternative

Future noise levels under the No Build Settlement Alternative are the same as the No Build Alternative due to the traffic and roadway lane configurations being consistent between the two alternatives. Predicted 2030 worst-hour traffic noise levels with the guardrail would increase due to increased traffic volumes along the existing alignment in the year 2030, and worst-hour future-year traffic noise levels would approach or exceed the NAC at the same 14 modeled sites shown on Figure 3-14.

TSM Alternative

Future noise levels under the TSM Alternative are the same as the No Build Alternative and No Build Settlement Alternative due to the traffic and lane configurations being consistent between the three alternatives. Predicted 2030 worst-hour traffic noise levels with the guardrail would increase due to increased traffic volumes along the existing alignment in the year 2030, and worst-hour future-year traffic noise levels would approach or exceed the NAC at the same 14 modeled sites (See Figure 3-14).

Pedestrian Shift Alternative

Predicted 2030 worst-hour traffic noise levels associated with the Pedestrian Shift Alternative ranges from 45 dBA to 67 dBA with a decrease of 8 dBA to an increase of 2 dBA compared to existing noise levels. A decrease in noise levels compared to the No Build Alternative is predicted at some modeled sites, where the alignment shifts the furthest away from nearby residences. Increased noise levels of up to 2 dBA may result from increased traffic volumes and the Pedestrian Shift nearer to the modeled sites in the year 2030. Worst-hour future-year traffic noise levels with the Pedestrian Shift Alternative approach or exceed the NAC at five (5) residences and Chun's Reef located adjacent to and makai of Kamehameha Highway near Ashley Road (See Figure 3-15).

3.12.4 Avoidance, Minimization, and Mitigation Measures

Noise abatement measures must be considered as part of the project if traffic noise impacts are identified and must be provided where it is feasible and reasonable to do so. Impacts occur at sites where traffic noise levels approach or exceed the NAC of Leq(h) 67 dBA, or substantially exceed

Figure 3-14. No Build Alternative Traffic Noise Impacts

Figure 3-15. Pedestrian Shift Alternative Traffic Noise Impacts

(by 15 dBA or more) the ambient noise levels. HDOT's Highway Noise Policy and Abatement Guidelines are used to determine whether noise abatement measures can be implemented, depending on whether these measures are feasible, reasonable, and desired.

The No Build Alternative and No Build Settlement Alternative have 14 sites (12 residences and 2 beach park areas) that would approach or exceed the NAC. These alternatives are used as the baseline to compare future traffic noise levels, therefore noise abatement was not modeled for these alternatives.

TSM Alternative

In the event that HDOT decides to proceed with this Alternative instead of the Pedestrian Shift, a noise abatement evaluation would be conducted to determine whether noise mitigation is feasible in accordance with the HDOT Noise Analysis and Abatement Policy.

Pedestrian Shift Alternative

When compared to the No Build Alternative and No Build Settlement Alternative, the Pedestrian Shift Alternative noise impact model has five (5) residences and Chun's Reef approach or exceed the NAC.

Although the Pedestrian Shift reduces the overall impact of the Highway on ambient noise environment by shifting the Highway away from noise sensitive receptors, the HDOT Noise Analysis and Abatement Policy requires that they be evaluated for noise abatement.

All sites predicted to experience impacts under the Pedestrian Shift Alternative were considered for noise abatement. Mitigation considerations include the feasibility of physically constructing noise mitigation (i.e., noise walls or barriers) to shield affected noise receptors from traffic noise in a way that would provide at least a 5-dBA traffic noise reduction. The evaluation concluded that noise barrier placement would not be feasible because access to private driveways and side streets that connect to Kamehameha Highway would have to be maintained and a barrier with such frequent openings could not provide a 5-dBA reduction. Therefore, no noise abatement, including noise barriers, are proposed for the Pedestrian Shift Alternative.

3.13 Hazardous Materials

3.13.1 Existing Condition

Hazardous materials are transported on Kamehameha Highway, as the only route circumnavigating the North Shore, including transportation by the military. The only businesses in the project area are ranch related; most of the properties are single family residential housing. According to HDOH database (https://eha-cloud.doh.hawaii.gov/connect/map) no hazardous materials were identified at properties in the project area along Kamehameha Highway, and no reported spills were identified in the project area. The Kawailoa Transfer Station is off Kawailoa Drive on the way to the project area from Haleiwa.

3.13.2 Potential Impacts

No Build Alternative

Under the No Build Alternative, no change in the quantity or type of hazardous materials being transported through the project area are anticipated.

No Build Settlement Alternative

Under the No Build Settlement Alternative, no change in the quantity or type of hazardous materials being transported through the project area are anticipated.

TSM Alternative

Under the TSM Alternative, no change in the quantity or type of hazardous materials being transported through the project area are anticipated.

Pedestrian Shift Alternative

Under the Pedestrian Shift Alternative, no change in the quantity or type of hazardous materials being transported through the project area are anticipated.

3.13.3 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, and mitigation measures are proposed for any of the alternatives, since no impacts are anticipated.

3.14 Air Quality

As required by the 1977 Clean Air Act (CAA), National Ambient Air Quality Standards (AAQS) were established by the U.S. Environmental Protection Agency (USEPA) for seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NOx), ozone (O_3), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), sulfur oxides (SOx), and lead. Current standards for ozone and $PM_{2.5}$ were established in September 1997. The State of Hawaii has also established its own standards for these pollutants.

CAA Section 107 requires the USEPA to publish a list of geographic areas that are not in compliance with the National AAQS, and these areas are called non-attainment areas. Areas that have insufficient data to make a determination are unclassified, and are treated as attainment areas until proven otherwise. The designation of an area is made on a pollutant-by-pollutant basis.

3.14.1 Existing Condition

The State of Hawaii is designated as an attainment area for CO, ozone (O3), PM_{10}, and $PM_{2.5}$. The Department of Health does not operate any stationary air monitoring sites on the North Shore of Oahu.

3.14.2 Potential Impacts

None of the alternatives is predicted to cause or exacerbate a violation of the State or National AAQS.

The pollutants relevant to evaluating the air quality impacts of a roadway project are those contained in motor vehicle emissions. Vehicles emit carbon monoxide (CO), volatile organic compounds (VOCs), the six-priority mobile source air toxics (MSAT), nitrogen oxide (NOx), and lead (lead levels have decreased substantially and will continue to do so due to the mandated elimination of lead in gasoline). Those pollutants can react in the atmosphere to generate PM_{10} and $PM_{2.5}$ on a regional basis. CO air pollution is generally considered to be a microscale problem that can be addressed locally to some extent. The other pollutants degrade air quality at a regional scale.

Regional air quality impacts related to VOC, the six priority MSAT, NOx, PM_{10}, and $PM_{2.5}$ are primarily dependent on changes in vehicle miles traveled (VMT), vehicle hours traveled (VHT), and vehicle mix (gasoline-fueled cars vs. diesel-fueled trucks and buses). None of these factors are predicted to change significantly among the alternatives. Therefore, the four alternatives would have similar impacts.

3.14.3 Avoidance, Minimization, and Mitigation Measures

No Avoidance, Minimization, and Mitigation Measures are proposed for any of the alternatives, because no violation of the State or National AAQS is anticipated. Implementing air quality mitigation measures for long-term traffic-related impacts are unnecessary and unwarranted because no significant variation of VMT, VHT, and vehicle mix is expected between the No Build Alternative/No Build Settlement Alternative, and the Build Alternatives (TSM and Pedestrian Shift). In addition, CO concentrations are expected to remain well within the National and State AAQS.

3.15 Social and Economic Conditions

3.15.1 Non-Discrimination Guidance

HDOT’s Title VI Plan (2019) is designed to fulfill its responsibilities under Title VI of the Civil Rights Act of 1964, as amended, Executive Order (EO) 12898 on Environmental Justice, US DOT Order 5610.2 on Environmental Justice, and other related non-discrimination regulations and directives. Because Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, or national origin, HDOT uses detailed race categories to attempt to treat people of different national origins equitably in its highway planning, programs, and activities.

EO 12898, called “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed by the President on February 11, 1994. It directs federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority or low-income populations. If minority or low-income populations are found in the project vicinity, good faith effort must be made to ensure that disproportionate and adverse impacts on low-income and minority populations are prevented, minimized, or mitigated. An example of good faith effort is additional public notification or outreach to these groups. While this is not a federal action, federal guidelines provide an appropriate standard as HDOT’s policies are designed to conform to the federal framework.

Pursuant to EO 12898, "low-income" is defined as households with incomes at or below the U.S. Department of Health and Human Services (DHHS) poverty guidelines. The 2019 poverty guidelines for the state of Hawaii is at or below $29,620 for a family/household of four.

The federal definition of "minority" includes the following groups:

- Black: a person having origins in any of the black racial groups of Africa.
- Hispanic: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- Asian: a person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent or the Pacific Islands.
- American Indian or Alaskan Native (AIAN): a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.
- Native Hawaiian or Other Pacific Islander (NHOPI): a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

HDOT's definition of a minority group is as follows:

> *Any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed HDOT program, policy or activity*.

HDOT's Title VI Plan states that income and demographic data is to be used to identify applicable populations; the methodology for data collection, maintenance, and analysis follows the Title VI Plan. The following discussion relies on 2010 census data, the most recent data available at this time.

3.15.2 Existing Condition

General Socio-Economic Conditions

The following discussion is based on selected U.S. Census data for the project area, summarized in Table 3-3 through Table 3-5. The statistics are based on the 2010 Census, as the 2020 Census is ongoing. It should be noted that the analysis is for a highway project, which impacts a far greater population than just those who live in the project area.

Population and Ethnicity

Table 3-3 exhibits demographic characteristics for the State of Hawaii, Honolulu County (Island of Oahu), and Kawailoa Census Tract (Census Tract 100). Data for each of these three populations are displayed for comparative purposes in order to characterize the demographic and socio-economic data of the area surrounding the project site.

The State of Hawaii is an unusual, but increasingly common case, where traditionally-defined "minority" populations make up most of the population. The largest ethnic group in Hawaii is Asian. This group makes up 38 percent of the overall State population. Those who classify themselves as "Two or More Races" make up 23.8 percent of the population in Hawaii.

The population of the Kawailoa Census Tract, which includes the project area, was 3,616 in 2017. As indicated in Table 3-3, the demographic characteristics of Kawailoa Census Tract residents are for the most part similar to that of the general population of Oahu and the State, except for a few variations. A higher portion of the population in the Kawailoa Census Tract is White and Black or African American than that of the State and island. The other difference is a smaller Asian and Native Hawaiian/Other Pacific islander population in comparison to the island and State.

Table 3-3. Demographic Characteristics

	Hawaii	Honolulu County	Kawailoa Census Tract
Population	1,406,299	980,080	3,616
Ethnicity			
White	25.1%	21.1%	59.8%
Black or African America	1.8%	2.4%	12.9%
American Indian / Alaska Native	0.2%	0.1%	0%
Asian	38%	42.9%	8.9%
Native Hawaiian / Other Pacific Islander	10%	9.3%	7.4%
Some Other Race	1%	1%	0.1%
Two or More Races	23.8%	23.2%	10.9%
Age			
Under 18 Old	21.6%	21.4%	21.5%
18 to 64 Years Old	61.6%	62.1%	71.9%
65 or More Years Old	16.8%	16.4%	6.6%

Source: U.S. Census Bureau (2017). *American Community Survey 5-year estimates.* Retrieved from *Census Reporter Profile page, Kawailoa Census Tract, Honolulu County, HI*

Table 3-4. Income and Employment Characteristics

	Hawaii	Honolulu County	Kawailoa Census Tract
Number of Households	455,502	311,451	1,248
Median Household Income by Household	$74,923	$80,078	$53,750
Civilian Labor Force Unemployed	3.0%	2.8%	4.1%
Persons Below Poverty Level	10.3%	9.1%	9.7%

Source: U.S. Census Bureau (2017). *American Community Survey 5-year estimates.* Retrieved from *Census Reporter Profile page for Kawailoa Census Tract, Honolulu County, HI*

Income and Employment

Table 3-4 shows the median household incomes and employment characteristics. Median household incomes in the Kawailoa Census Tract were lower than the median incomes for Oahu and the State. The same percentage of households in the Kawailoa Census Tract live on social security, and retirement, in comparison to Oahu overall, but a lower percentage of households receive public assistance. Table 3-4 also shows that unemployment in the project area's subdivision is similar to that of the State and island. The proportion of persons living below the poverty line in the Kawailoa Census Tract is also about the same as the State and island.

Housing

As shown in Table 3-5, in the Kawailoa Census Tract, only 21% of the homes are owner occupied, a much lower percentage than the State and the City. The homes are also about a third more expensive than others in the State and City.

Table 3-5. Housing Characteristics

	Hawaii	Honolulu County	Kawailoa Census Tracts
Number of Housing Units	535,543	346,374	1,469
Owner-Occupied Units	58.1%	55.6%	21.0%
Renter-Occupied Units	41.9%	44.4%	79.0%
Median Structure Value	$538,400	$602,700	$961,200

Source: U.S. Census Bureau (2017). *American Community Survey 5-year estimates.* Retrieved from *Census Reporter Profile page.*

3.15.3 Potential Impacts

In accordance with the federal definition of "minority" (See Section 3.15.1) which includes those of Asian and Native Hawaiian/Pacific Island ancestry, the proposed project improvements will not disproportionately affect minority populations. Census data also indicates that low-income populations also will not be disproportionately affected. Socio-economic trends illustrate a population where the many expensive homes are rented versus owner occupied. Impacts such as noise and air will not worsen as a result of any of the alternatives, and most will be temporary in relation to construction activities. Benefits will include a safer roadway, ease of mobility, and an overall enhancement in the quality of life. Resolving the traffic bottleneck will save driving time, enhance productivity, and decrease fuel consumption.

3.15.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, and mitigation measures are proposed for any of the alternatives.

3.16 Construction Impacts

In contrast, to the Pedestrian Shift Alternative, the TSM Alternative will have minimal construction impacts. Construction activities for the TSM Alternative would cause motorists on Kamehameha Highway to experience delay and inconvenience for a few days for installation of guardrail, and signage. There would also be some limited fugitive dust and noise impacts from construction activities. This Alternative is not addressed further in this section.

Most construction impacts are associated with the Pedestrian Shift Alternative; these impacts are the focus of the remainder of this section.

3.16.1 Maintenance of Traffic and Parking

The Pedestrian Shift Alternative may cause motorists traveling on Kamehameha Highway to experience some delay and inconvenience for approximately twenty-four months, the estimated duration of construction.

Laniakea Beach will remain open and accessible to the public throughout the duration of construction. Public access to City DPR's parking area will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. To minimize traffic and access problems on Kamehameha Highway and adjacent side streets (including the City DPR's parking area), construction phasing and traffic control plans will be developed and implemented. Bus stops will be temporarily relocated as required. Traffic control signage such as "No Parking" or "Right Turn Only" signs will be installed as needed. All necessary signs, lights, barricades, and other safety equipment for motorists and pedestrians will be installed and maintained by the contractor during the construction phase of the project.

Most proposed construction activities that directly affect Kamehameha Highway will be restricted to off-peak nighttime hours due to the traffic impacts that may occur if they were performed during daytime hours.

The public will be routinely informed of planned construction activities and lane closures throughout the construction period. Some construction work (i.e., shoulder activities such as placing signage) may take place at any time of the day (daytime and nighttime, 24-hours a day, 7 days a week), provided the activities require the closure of no more than one through lane for a short period of time.

3.16.2 Air Quality

Air quality impacts during roadway construction for Pedestrian Shift Alternative generally consist of fugitive dust and mobile source emissions from construction equipment.

Fugitive dust is airborne particulate matter, of usually large particle size, generated by construction vehicles operating around construction sites and from material blown from uncovered haul trucks, stockpiles, and exposed areas. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because its generation varies greatly depending upon the type of soil, the amount and type of dirt-disturbing activity, the moisture content of exposed soil, and wind speed.

Frequent watering controls fugitive dust at construction sites. In addition, wind screens may be used in areas near residences and commercial districts, as well as limiting the areas of disturbance at any given time. Landscaping will be re-established as early as possible. To prevent haul trucks from tracking dirt onto paved streets, tire washing, or road cleaning may be appropriate. State regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting wind-erodible materials.

Construction vehicles and equipment emit engine exhaust. The largest of this equipment is usually diesel-powered, which emit relatively high levels of NO_x in comparison to gasoline-powered equipment. However, standards for such pollutants are set on an annual basis and therefore not likely to be violated by short-term construction equipment emissions.

3.16.3 Noise

Construction for the Pedestrian Shift Alternative involves the use of heavy machinery that may cause temporary noise impacts to adjacent noise sensitive land uses. Table 3-6 presents a range of noise levels for various construction equipment anticipated to be used during construction of the proposed project. Equipment noise levels vary depending on the make and model of the equipment, the operation being performed, the condition of the equipment, and other variables. The noise levels listed are based on published measurements taken at a distance of 50 feet from the equipment.

Table 3-6. Construction Equipment Noise Levels

Equipment	Decibels	Equipment	Decibels
Standard Construction Equipment		Light Impact Equipment	
Truck	75 - 90	Jack Hammer	81 - 98
Saw	72 - 81	Jumping Jack	81 - 97
Light Tower	62 - 72		
Cold Planer	79 - 88		
Paving Machine	86 - 88	Heavy Impact Equipment	
Roller	63 - 70		
Striping Machine	75 - 86	Hoe Rams	95 - 106
Concrete Truck	75 - 88	Vibratory Sheet Pile Driver	90 - 100
Backhoe / Loader	72 - 83		
Compressor	74 - 87		
Generator	71 - 82		
Crane	75 - 87		

Since HDOH maintains community noise control standards (HAR Section 11-46) that apply to construction noise, these specifications will be followed. A noise permit will be obtained for construction activities performed during standard work hours (Monday through Friday 7:00 a.m. through 6:00 p.m. and Saturday 9:00 a.m. through 6:00 p.m.).

A noise variance will be obtained to allow construction activities to occur beyond standard work hours. As discussed in Section 3.16.1, construction may occur at night, weekend or holiday hours, beyond standard work hours due to the traffic impacts that would ensue, should the work be performed during normal work hours. As part of obtaining the noise variance, HDOT may hold a public meeting, send notices to residents within 500 feet of the project, and/or place an advertisement in the paper.

The noise variance application outlines mitigation measures that may be employed to lessen noise disturbances during night work, including such tasks as:

- The contractor sending an informational flyer to all addresses within 500 feet of the project area roughly two weeks prior to the start of construction. The flyer will include general project information and the name and phone number of a contractor representative to contact.
- Updating of HDOT's website with information regarding the time and location of night work as well as a name and phone number to contact with questions or complaints.
- Quiet work procedures will be employed to attenuate and control noise emissions emanating from the construction site, such as:

- Either ambient-sensing backup alarms or ground guides will be used for signaling when equipment backs up at night (8:00 p.m. to 6:00 a.m.).
- Construction activity constraints for night work, where applicable.
- The use of temporary noise barriers for both daytime and nighttime sensitive receptors, where feasible.
- The strategic placement of stationary equipment such as compressors and generators.
- All equipment will be maintained in good working order and with appropriate mufflers.
- A job-site inspector will be designated to whom immediate complaints can be forwarded for prompt response and who will have the general responsibility of monitoring quiet work procedures.
- Instructional meetings will be held with construction crews and truck drivers to discuss noise abatement procedures, including the use of engine brakes, loading and unloading cargo, shouting, use of signal callers, and other practices as required.
- The selected contractor will have a corrective action program in place that lays out steps and responsibilities to respond to complaints and correct deficiencies.
- Final noise mitigation measures will be specified in the noise variance granted by DOH.

3.16.4 Water Resources

This section discusses three types of water resources: water recreational resources, surface water quality, and drinking water.

Laniakea Beach is well known for basking sea turtles and surf spots. Laniakea Beach will remain open to the public. Access to the City DPR's parking area will be available during construction as coordinated around the Contractor's work areas. Accessing the beach during construction may require parking in other locations.

The other primary potential for construction-phase water resource impacts is associated with erosion and sedimentation associated with the project's earth disturbing activities. Preventing polluted run-off from impacting the nearshore waters is particularly important given the location of the Pedestrian Shift Alternative located adjacent to the nearshore reef. The project will not alter existing drainage patterns.

During construction, BMPs will be implemented to prevent debris and polluted run-off from stream or other natural waters. Storm water run-off and erosion during project construction and landscaping will be mitigated through the use of construction BMPs established and permitted before work begins. The project will obtain a Notice of General Permit Coverage (NGPC) from the HDOH as part of the National Pollutant Discharge Elimination System (NPDES) program. Generally accepted BMPs such as the following will be used:

- Work area isolation devices, such as diversion dams;
- Perimeter controls and sediment barriers, such as silt fences;
- Minimizing disturbance area;

- Excavated/Stockpiled material protection, including the covering of stockpiles;
- Storm drain inlet and catch basin protection devices will be installed; and
- Proper waste management will occur, including separation of recyclable material.

Interruptions to water service during driveway reconstructions or service line relocations, if needed, will be coordinated with the affected property owners and the Board of Water Supply (BWS). Construction drawings affecting BWS infrastructure, if any, will be submitted to BWS for approval.

3.16.5 Biological Resources

Construction lighting will be directed to the ground to the extent possible to help avoid confusing seabirds and sea turtles. During the shearwater nesting season, September 15 until December 15, construction activities will be limited to daylight hours whenever possible, and only lighting that is required for safety and security concerns will be allowed. Any necessary lights will be positioned low to the ground, be motion triggered, when possible, and shielded. On-site staff will be educated about seabird fallout that occurs when birds flying at night are attracted to artificially lighted areas resulting in disorientation and exhaustion.

The construction lighting plan will also take sea turtles resting, foraging, and their hatchlings into consideration. Shielded lighting to reduce direct and ambient lighting of beach habitats within and adjacent to the project site will be used. When possible, night work near the beach will be avoided between May 1and November 1, the sea turtle nesting and hatching season.

To minimize the potential for impacts to the Hawaiian hoary bat, woody vegetation taller than 15 feet (4.6 meters) will not be cleared during the annual the bat pupping season between June 1 and September 15.

To control the transfer of invasive plants and animals, HDOT will require the contractor to employ measures that include:

- Construction equipment cleaning prior to the equipment arrival at the site, and prior to its moving to an offsite location;
- Segregation of stockpiled and spoil materials. Excavated soils will be reused to the maximum extent practicable at the site from which it was removed; and
- Sediment and erosion control measures to ensure that stockpiled or spoil materials will not result in spread of invasive species from one area to another via storm water run-off.

3.16.6 Solid Waste Management and Hazardous Waste

Good housekeeping BMPs will be required of the contractor, such as ensuring that:

- All waste materials be collected and stored in securely lidded dumpsters that are emptied before becoming overly full and not buried on site;
- Materials stored on-site be stored in a neat, orderly manner in appropriate containers (i.e., per manufacturers recommendations);

- All on-site vehicles be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage;
- A spill cleanup kit be located on-site where petroleum products, paints, or other hazardous materials are stored; and
- All sanitary waste generated during the construction phase will be collected from portable units as required and directed to a HDOH-permitted treatment facility.

As stated in Section 3.13, hazardous materials contamination is not likely to be uncovered during construction. However, during construction, personnel should be alert for signs of potential petroleum contamination when soil is excavated. If contamination were identified during construction, the contractor will report it immediately to HDOT. Handling of hazardous materials and possible site remediation will be required in accordance with applicable State and federal laws, specifying the handling, treatment, and disposal of contaminated materials.

3.16.7 Historic and Archaeological Resources

For Site T-1, during construction, interim protective fencing be established around the potential ceremonial site and stay in place during the entire course of road construction activity. Once construction has been completed and the protective fencing removed, the long-term treatment of the site will remain the responsibility of the landowner (Kamehameha Schools).

Construction activities have the potential to encounter undocumented burial and archaeological sites. A qualified archaeological monitor will be present during ground-disturbing activities associated with development of the proposed roadway. A monitoring plan compliant with HAR §13-279 will be prepared prior to construction. If undocumented burial and archaeological sites are uncovered during construction, work will stop and the appropriate authorities, including SHPD and the police, will immediately be notified. The treatment of burials shall be conducted in accordance with HAR §13-300. Construction in the area of the find will resume upon approval of the appropriate authorities.

3.16.8 Relationship of Short-Term Uses and Long-Term Productivity

Construction of the proposed project may have short-term effects on the environment as described in this section. These effects end with the completion of construction.

The proposed Pedestrian Shift Alternative will provide long-term improvements to the transportation system as described in Section 1.4. The long-term safety and mobility benefit that are provided by the proposed alternative are greater than the short-term adverse effects on the human environment. Furthermore, the Pedestrian Shift Alternative does not exclude future options, narrow the range of beneficial uses of the environment, or pose long-term risks to health and safety.

3.17 Consistency with Government Plans, Policies, and Controls

This section discusses whether the proposed project is consistent with existing government plans, policies, and controls.

3.17.1 State of Hawaii Plans and Land Use Controls

Hawaii State Plan Transportation Functional Plan

The Hawaii State Plan (Transportation Functional Plan), 1991, consists of comprehensive goals, objectives, policies and priorities for all areas of government functions, including transportation. Since the Transportation Functional Plan is dated, many of the specific actions have already been completed. This project addresses congestion, one of the four issues considered most critical in the plan.

Hawaii 2050 Sustainability Plan

The Hawaii 2050 Sustainability Plan, July 2021 (Hawaii State Plan), prepared pursuant to HRS 226-65, serves as strategic action plan for climate and sustainability for the next ten years (2020-2030). Eight focus areas are listed:

1. Promote a Sustainable Economic Recovery through strategies that support local agriculture, green workforce development and education, and sustainable and regenerative tourism.

2. Reduce Greenhouse Emissions by continuing to monitor the State's emissions and reduce greenhouse gas emissions through strategies in the energy, transportation, agriculture and waste sectors.

3. Improve Climate Resilience by continuing to monitor and adapt to climate impacts and take actions to increase the resilience of the natural and built environments and their occupants.

4. Advance Sustainable Communities through strategies that improve land use and access to green space, advance sustainable practices in schools, and encourage sustainable buildings and infrastructure.

5. Advance Equity by ensuring equitable access to resources, addressing affordable housing and homelessness crises, and improving gender equity.

6. Institutional Sustainability Throughout Government by increasing the government's capacity through institutionalized collaboration to address sustainability and greening government operations.

7. Preserve the Natural Environment including a focus on clean water, marine resources and ecosystems, and natural resource protection.

8. Perpetuate Traditional Ecological Knowledge and Values as Hawaii collectively tackles these sustainability challenges.

While the majority can be considered applicable, the project is most consistent with focus area Number 3 (Improve Climate Resilience).

Hawaii State Land Use Controls

The State Land Use Commission (SLUC), under the authority granted in HRS Chapter 205, regulates land use through classification of State lands into four classifications: Urban, Agriculture, Conservation, and Rural. The intent of the land classification is to accommodate growth and development while retaining the natural and agricultural resources of the State. Each district has specific land use objectives and development constraints. The proposed project is in Agricultural zoned land.

Coastal Zone Management, Chapter 205A-2 of the Hawaii Revised Statutes

The TSM Alternative would involve placing guardrail within the roadway right-of-way. Because the right-of-way is seaward of the certified shoreline, the Special Management Area (SMA) Use Permit and Shoreline Setback would not be required (See Appendix C for a Map of the Certified Shoreline).

The Pedestrian Shift Alternative is the preferred alternative. This Alternative is development, as defined by HRS Chapter 205A-22, within the regulated Special Management Area and Shoreline Setback. Figure 3-16 shows the Pedestrian Shift Alternative relative to the certified shoreline. Therefore, consistency with the Coastal Zone Management (CZM) Program Policies and Objectives is applicable.

Figure 3-16. Pedestrian Shift Alternative and Certified Shoreline

The following brief discussion describes the Pedestrian Shift Alternative's consistency with policies and objectives of the CZM Program.

Recreational Resources. The Pedestrian Shift Alternative will remove unsafe conflicts between Highway operations and beach access by moving the existing Highway mauka of Laniakea Beach.

This Alternative will convert the existing Kamehameha Highway to a shared use path, establishing an initial link to future-planned non-motorized facilities along Kamehameha Highway, which promotes multimodal access to Laniakea Beach, and enhances recreational uses of the area. Remaining sections of the existing pavement will be reverted to coastal vegetation, expanding the recreational resource.

No existing recreational resources will be removed by this Alternative. Laniakea Beach will remain open and accessible to the public throughout the duration of construction. Access to the City DPR's beach support parking area will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the 24-month construction period.

Historic Resources. The AIS Report, which included pedestrian survey and subsurface testing was prepared. The Pedestrian Shift Alternative was developed to avoid impacts to significant historic and cultural resources. As described in Section 3.3, both sites identified within the study corridor will be physically avoided during construction. The Lauhulu Stream Bridge will be converted to pedestrian use, and Site T-1 will remain undisturbed on land owned by Kamehameha Schools.

Scenic and Open Space Resources. The Pedestrian Shift Alternative will not obstruct coastal or mountain views.

Coastal Ecosystems. The Pedestrian Shift Alternative will not only protect coastal ecosystems, it will benefit them by reducing and scaling back urban encroachment. Addition of permeable surfaces and permanent BMPs installed by the project will mitigate and minimize surface storm water run-off.

Economic Uses. The Hawaii and North Shore economy is driven by tourism. The traffic delays caused by pedestrians crossing the Highway (who are predominantly visitors) and Oahu residents who feel held captive by traffic delays, is a source of tension between economic use and residential quality of life. While there are larger contexts to this issue, the Pedestrian Shift Alternative will help to restore balance between these interests. Ultimately the Alternative allows coastal economic uses to occur without infringing on the local quality of life.

In addition, moving the Highway inland will improve the resilience and reliability of the transportation network. The movement of goods and services will continue unimpeded by the effects of shoreline erosion and sea level rise.

Coastal Hazards. The Pedestrian Shift Alternative will move Kamehameha Highway inland to mitigate its periodic closures due to wave inundation. Inland relocation will also defend the Highway from the effects of climate change and sea level rise. No changes to flood zone maps will be required as a result of the roadway's relocation.

Managing Development. The Pedestrian Shift Alternative has been developed through public participation. As discussed in Section 2.4 and Section 2.5, it is largely based on the Quinlan Realignment Alternative, which was strongly advocated by the community and presented in a task force advisory group assembled by HDOT. At the time, it did not meet the purpose and need when the primary project purpose was to address coastal highway erosion at both Laniakea Beach and Chun's Reef. When the project re-prioritized safety at Laniakea Beach, this Alternative became a viable option. HDOT met with residents at Pohaku Loa Way, residents on the Haleiwa side of Laniakea Beach, Kamehameha Schools, the City DPR, and local ranchers to develop the Pedestrian Shift Alternative design.

Public Participation. See Managing Development.

Beach Protection. As certified by the Board of Land and Natural Resources (See Appendix C), the existing Kamehameha Highway is seaward of the shoreline in the project area. The proposed

Pedestrian Shift Alternative will relocate the Highway such that it is inland from the certified shoreline. In doing so, the Alternative will accomplish the goals of minimizing the existing Kamehameha Highway's interference with natural shoreline processes.

Marine Resources. The Pedestrian Shift Alternative will not have an adverse impact on marine resources. Naturalizing part of Kamehameha Highway will benefit the coastal ecosystem by reducing the impervious surface near the coastline. Impervious surfaces contribute to storm water run-off potential, which acts as a vehicle for contributing both natural and manmade pollutants to marine waters.

3.17.2 City and County of Honolulu Plans and Controls

City and County of Honolulu General Plan

The General Plan Objectives and Policies (General Plan) for the City and County of Honolulu (City) is a requirement of the City Charter. The City first adopted the General Plan in 1977 and since that date, the General Plan has been amended several times, most recently in 2002. This project is consistent with the following objectives and policies in Section V. Transportation and Utilities:

- Objective A, Policy 5 "Improve roads in existing communities to reduce congestion and eliminate unsafe conditions."
- Objective D, Policy 1 "Give primary emphasis in the capital-improvement program to the maintenance and improvement of existing roads and utilities."

The General Plan divides up the island of Oahu into eight sections, each having their own development plans, which are intended to guide City land use approvals, infrastructure improvements and private sector investment decisions. This project is located on the North Shore, within an area designated as rural.

North Shore Sustainable Communities Plan

North Shore Sustainable Communities Plan (2011) focuses on the retention of the existing rural character, the provision and maintenance of adequate infrastructure and public facilities, the protection agricultural lands, development pressure, affordable housing and appropriate visitor accommodations. The proposed project is consistent with the policies of the NSSCP because the proposed project preserves adequate infrastructure for transportation and emergency access. It will keep Kamehameha Highway as a two-lane highway consistent with the region's rural character and rural lifestyle. The project will preserve the scenic view as seen from Kamehameha Highway.

Two of the guidelines for implementing the policies for the recreational resources in the NSSCP, 3.3.2.3 Beach Parks and Shoreline Areas and 4.4.1 Roadway Network, are germane to the project. In particular, as a transportation project which addresses an issue at a popular recreation site, the proposed project would "improve and expand public access to the shoreline……where justified by public demand, traditional use patterns, the quality of the recreational resources, emergency services response time, or to bypass natural barriers that impede public access to the shoreline." The need for the proposed project is specifically called out in the Roadway Network section – "resolution of the traffic congestion at Laniakea is a high priority for the community." The NSSCP specifically mentions “re-routing the segment of Kamehameha Highway that passes Laniakea Beach inland” but pairs it with a discussion of the City planned beach support facilities on the mauka side of the highway that the City has no current plans to implement. The NSSCP is currently under review for revisions and the General Plan is under revision at Council as Resolution No. 21-23.

Oahu Regional Transportation Plan

The Oahu Regional Transportation Plan 2040 (ORTP), dated April 2016, identifies the major land transportation improvements needed by the year 2040. The recommendations of the ORTP represent those projects needed to support anticipated growth and development on the Island of Oahu. The proposed project is consistent with the goals and objectives identified in the ORTP.

The ORTP includes System Preservation Projects 502 and 552 for protecting shoreline along Kamehameha Highway, which is a secondary purpose for the project. Twenty million dollars is designated from 2019 to 2029, and 30 million dollars is designated from 2030 to 2040.

Zoning

City and County of Honolulu zoning is required to be in conformance with Development Plan designations of the Department of Planning and Permitting (DPP) and Land Use Ordinance (LUO). The LUO provides a list of zoning districts and precincts and the permitted uses and structures for each district and precinct. The purpose of the LUO is to regulate land use to encourage orderly development in accordance with adopted land use policies, including the General Plan and the NSSCP, and to promote and protect the public health, safety and welfare.

The existing Kamehameha Highway right-of-way lies within the AG-1, Restricted Agricultural District. The proposed project will relocate the Highway further inland within this same zone. Current land uses adjacent to the Highway, R-5, Residential (makai) and AG-1, Restricted Agriculture, will remain consistent with their established zoned uses. No changes to land use are anticipated as a result of the proposed project.

Special Management Area and Shoreline Setback

HRS Chapter 205A, Chapter 25 of the City and County of Honolulu’s Revised Ordinances of Honolulu (ROH), and Chapter 23 of the ROH outline special controls, policies and guidelines for development within areas along the shoreline, which are designated as the SMA, and shoreline setback area. The location of the shoreline was certified by DLNR on July 30, 2020 and is included as Appendix C. Figure 3-16 illustrates which elements of the Pedestrian Shift Alternative are seaward of the certified shoreline, and those elements that are mauka of the certified shoreline. Project elements that are mauka of the certified shoreline are presumed to be development, according to the definition provided in Chapter 25 of the ROH. A SMA Major permit and shoreline setback variance will be required.

The following is a brief discussion of the project’s consistency with the SMA review guidelines (ROH Section 25-3.2):

(a) All development in the special management area shall be subject to reasonable terms and conditions set by the council to ensure that:

1) *Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles;*

   The project will remove unsafe conflicts between Highway operations and beach access by moving the existing Highway mauka of Laniakea Beach. Remaining sections of the existing Highway pavement will be reverted to coastal vegetation, expanding the recreational resource, and removing urban encroachment, including parked vehicles, further away from coastal resources.

2) *Adequate and properly located public recreation areas and wildlife preserves are reserved;*

   The project will resolve unsafe access issues created by the Highway's proximity to the shoreline and public recreation area.

3) *Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources; and*

   As a highway, the development is not a notable generator of solid or liquid waste for treatment. Moreover, because the project would relocate an existing highway, there will be no difference from the existing demands on special management area resources. See Section 3.16.6 for solid and hazardous waste management during construction.

4) *Alterations to existing landforms and vegetation; except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquake.*

   Section 3.1 describes the project's affect on the topography and flood risks. The project will protect the Highway from coastal erosion impacts, and minimizes the extent of flooding on Highway caused by 3.2-foot sea level rise.

   A detailed flood model was developed that indicates in the event of a tsunami, a localized increase in water surface elevation could occur in the pastureland adjacent to Lauhulu Stream, which is frequently inundated. No habitable structures would be affected. The detected changes would not be experienced at a scale that would require changes to flood or FIRM maps. The area will remain a tsunami evacuation zone, as well as a flood zone.

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

1) *The development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect and the elimination of planning options;*

The project will not have any substantial adverse environmental effect as described in Chapter 3 and Chapter 5. Neither will the project result in adverse secondary and cumulative impacts, as described in Section 3.18.

2) *The development is consistent with the objectives and policies set forth in ROH Section 25-3.1 and area guidelines contained in HRS Section 205A-26;*

The project is consistent with ROH Section 25-3.1 and HRS Section 205A-26, which are itemized in this section.

3) *The development is consistent with the county general plan, development plans and zoning. Such a finding of consistency does not preclude concurrent processing where a development plan amendment or zone change may also be required.*

The project is consistent with the City and County of Honolulu General Plan (2002), North Shore Sustainable Communities Plan (2011), Zoning, and Oahu Regional Transportation Plan 2040 (April 2016). The preceding subparts of this section describe the project's consistency with these plans.

(c) The council shall seek to minimize, where reasonable:

1) *Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon*;

The project will not dredge, fill or alter any bay, estuary, salt marsh, river mouth, slough or lagoon.

2) *Any development which would reduce the size of any beach or other area usable for public recreation*;

The project will not reduce the size of any beach or area usable for public recreation. On the contrary, as proposed, the project will expand the available coastal areas for public recreation by retreating the Highway from the shoreline.

3) *Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach;*

The project will relax the current limitations on access to Laniakea Beach by moving the existing Kamehameha Highway's operations inland.

4) *Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and*

Section 3.8 describes the project's anticipated impacts on scenic views. Given that Kamehameha Highway is the State highway nearest the coast, moving it inland will expand the line of sight from the highway. The project will not introduce new visual obstructions or elements that are incongruent with the existing environment between the realigned highway and the coast.

5) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

   The project will not adversely affect water quality, fisheries, fishing grounds, and wildlife habitats nor will it introduce a new structure into an area of open water free of visible structures. Although the project will require some acquisition of land used for ranching, the project has been designed to minimize this to the greatest extent feasible. As described in Section 3.2.2, the project will not result in a full displacement of the use.

See Section 3.17.1 for a discussion of the Pedestrian Shift Alternative's consistency with Chapter 205A Program policies and objectives.

3.18 Secondary and Cumulative Impacts

Secondary, or indirect, impacts are defined as "effects which are caused by the [proposed] action and are later in time or further removed in distance but are still reasonably foreseeable. Indirect effect may include growth-inducing effects and other effects related to changes in the pattern of land use, population density, or growth rate…"

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time." Cumulative impacts include the direct and indirect impacts of a project together with the reasonably foreseeable future actions of others.

3.18.1 Potential Secondary Impacts

No significant adverse secondary impacts are anticipated should the proposed project proceed.

Visitors will continue to explore the North Shore, and residents will continue to make their homes there, regardless of the proposed project. While realigning Kamehameha Highway will help improve congestion and prevent erosion, factors affecting development such as demand, property prices, and disposable income levels are likely to have a far greater effect on development or tourism. The proposed project will not constrain development. Proceeding with the project will have only a minor effect on overall development trends on the North Shore. Thus, the proposed project will not induce secondary land uses.

By creating safer access to the beach, more tourists may come, and add to the pressure placed on resting turtles and coastal resources, especially with an increase in vehicular traffic to the North Shore and increased commercial and self-guided tours of the well-publicized Green Sea turtle nesting area on the beach. There is no way to reasonably quantify this potential secondary impact, however, it is important to note that accessibility plays an extremely limited role in predicting the number of visitors to Laniakea Beach as the numbers of users has grown regardless of access restrictions. Because of this trend, any potential secondary impacts attributable to this project are not be detectable. Most importantly, federal regulations are in place to protect these marine species. Lastly, relocating the Highway inland and removing Highway pavement in favor of naturalization provides an opportunity for coastal ecosystems to rebound from human and development pressures.

3.18.2 Potential Cumulative Impacts

The Pedestrian Shift Alternative will not result in commitments to implement other projects or result in significant change to how the surrounding community would develop since State Land Use and Zoning controls are in place.

The Pedestrian Shift Alternative also will not directly result in cumulative effects on the environment. Kamehameha Highway is an existing piece of the transportation network, and its continued existence is vital for the community and island visitors.

3.19 Unresolved Issues

Unresolved issues include:

- The No Build Settlement Alternative was fully implemented in November 2021, as this Final EA was being produced. The No Build Settlement agreement has a one year commitment, but it is unknown whether the condition will revert back to the No Build or continue. For this reason, it is included as an alternate baseline condition with the No Build.
- Portions of the project are within the Conservation District, based on Shoreline Certification July 30, 2020. Because all project elements makai of the shoreline are within the existing roadway right-of-way, the State Highway exemption codified in HRS 264-6(2) is applicable, however there are circumstances where DLNR may retain jurisdiction. The requirement for a Conservation District design review or approval is under evaluation. The appropriate approval, if needed, will be obtained based on the outcome of this evaluation.
- Land acquisitions do not typically occur until after the environmental review has occurred. It is reasonable to assume that right-of-way negotiations with the City and County of Honolulu and Kamehameha Schools may result in larger parcel acquisitions than originally anticipated due to remnants that may remain. To reconcile this issue, land use impacts and impacts to the landowner are the focus of the impact assessment and not necessarily the amount of property acquired.
- Although the Archeological Inventory Survey (AIS) has been completed, coordination with SHPD has not yet been finalized (Section 3.3).

A certified wetland delineator surveyed the project area, and a jurisdictional determination has been prepared that indicate no wetlands will be impacted by the project. Coordination of these findings with the U.S. Army Corps of Engineers is ongoing (Section 3.6.2)

4.0 COMMENTS AND COORDINATION

This chapter summarizes the public and agency consultation and coordination activities specific to the pedestrian safety project that have been conducted to date.

4.1 Pre-Assessment and Early Consultation

Early consultation for the pedestrian safety project consisted of meetings with adjacent landowners, residents, and regulatory agencies to develop a community-accepted design. Once design concerns were addressed, scoping letters requesting input on the project were sent.

Scoping letters were sent to 284 recipients representing federal, State, and City agencies; organizations; government officials; landowners; and individual residents on January 26, 2021 and between February 2 and February 3, 2021. A list of recipients and copies of correspondences are provided in Appendix A-1.

Responses to scoping requests helped to inform preparation of the Draft EA.

4.2 Draft Environmental Assessment

The project's Draft EA was announced in the August 23, 2021 edition of The Environmental Notice, initiating the 30-day public comment period that concluded on September 22, 2021.

Twenty-four stakeholders or agencies submitted written comments on the Draft EA via e-mail or letters during the 30-day comment period. Four individuals or agencies submitted written comments after the deadline. Although State regulations specify that comments received after the Draft EA comment period need not be considered or responded to in the Final EA, HDOT elected to consider and include substantive comments received after the deadline (Hawaii Administrative Rules (HAR) §11-200.1-20).

One important reason for considering late comments is that the City and County of Honolulu's Ordinance No. 21-27 relating to revisions to the Special Management Area Use Permits (SMA) process was signed on August 25, 2021, two days after publication of the Draft EA. It requires that an applicant for an SMA present the proposed project to the applicable neighborhood board prior to its submittal. Additionally, the North Shore Neighborhood Board meeting schedule did not have a meeting that occurs within the Draft EA comment period. HDOT presented the project to the North Shore Neighborhood Board on September 23, 2021. Given the importance of the HRS 343 process in supporting the SMA application, as well as the Neighborhood Board's input, all comments received after the comment period were considered and addressed.

The following agencies and stakeholders provided comment on the Draft EA during the 30-day comment period:

State of Hawaii Agencies
Department of Land and Natural Resources, Engineering Division
Department of Land and Natural Resources, Land Division-Oahu District
Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Office of Planning and Sustainable Development

City and County of Honolulu Agencies
Board of Water Supply
Department of Design and Construction: Facilities Division
Department of Planning and Permitting
Honolulu Fire Department

Elected Officials
Councilmember Heidi Tsuneyoshi
Senator Gil Riviere

Individuals, Businesses, Organizations, and Community Groups
Beau Sheil
Bill Quinlan
Douglas Meller
Hawaiian Electric Company
Joanne Martin
Joe Wat
Kamehameha Schools
Laura Figueira
Patrick and Mahea Holtzman
Racquel Hill-Achiu
Sara Ackerman
Stanford Brown
William W. Saunders Jr.
William S. Richardson School of Law (*Professor Denise Antolini, Grant Barring, Joel Burgess, Charlotte Frank, Mark Cave, Meyer Cummins, Hiilei Casco, Palakiko Chandler, Kendrick S. Chang, Kenneth Go, Ying Gu, Debora Halbert, Joho Horton, Cale Honda, Jennifer Hee, Pa Ly, Tisha McKinney, Jake Ruby, Noah Hoshino, Kolby Kahahawai, Johnathen Kawakami, Loredana Craciun, Josiah K. Seawell, Gillian Kim, Shari Matsudo, Sarah Anne Mau, Evan Miyaki, Micah Miyasato, Elizabeth Songvilay, Abe Yi, Naima Te Maile, Farah Danial Mok, Chrisopher Pang, Claire Rossi de Leon, Diego Rivera, Kealapono Richardson, Siena Scharr, Kanani Smull, Malia Staab, Ionatana Tua, Olivia Wang, Kellie Wong, Alyssa Coushie, Christian Doles, Mona Heydarian*)

The following agencies and stakeholders provided comment on the Draft EA after the comment period ended on September 22, 2021:

State of Hawaii Agencies
State of Hawaii Department of Health, Clean Air Branch

City and County of Honolulu Agencies
Department of Parks and Recreation

Individuals, Businesses, Organizations and Community Groups
North Shore Neighborhood Board #27
Sandra Cashman

In accordance with HAR 11-200.1-20, each comment and its response is provided in Appendix A-2.

4.3 Regulatory Coordination

The project requires compliance with specific environmental laws and regulations. Coordination and consultation was conducted as described below.

4.3.1 Hawaii Revised Statutes Chapter 6E-8

As also described in Section 3.3, HRS Section 6E-8 is the State's law protecting historic resources and is applicable to this project because it is an agency-proposed action. HDOT met with the State Historic Preservation Division (SHPD) on June 18, 2020 to coordinate the subsurface testing strategy for the archaeological inventory survey (AIS). Based on this discussion, SHPD and HDOT have agreed to conduct archaeological monitoring for certain areas of the project, as described in Section 3.3 (see Appendix A-3).

An AIS has been prepared and is in the process of being submitted for SHPD's review.

4.3.2 Floodplain Coordination

HDOT met with the City and County of Honolulu's Floodplain Manager (City Floodplain Manager) and the Department of Land and Natural Resources' Engineering Division (DLNR-ENG) on November 14, 2019 to discuss regulatory requirements related to the floodplain (Appendix A-3). DLNR-ENG recommended that HDOT follow the guidelines that DLNR is developing concerning Flood Insurance Rate Maps (FIRM). Section 3.1 describes the project area's FIRM mapping and floodplain. To address floodplain impacts, Sea Engineering Inc. (SEI) modeled the changes that would occur to flooding for the proposed project (Laniakea Highway Relocation Inundation Analysis and Coastal Assessment, FEMA's FIRM Method Tsunami Runup Modeling, in Appendix I). The study showed little change in tsunami inundation caused by the proposed new alignment and no changes to the FIRM maps are proposed.

During the scoping phase for this current project, FEMA (February 17, 2021), wrote to address development in the floodplain. In addition to the study cited above, a hydraulic study and a drainage study (Appendix F and Appendix G) were performed to determine both the impact of the new bridge on flood elevations and required permanent BMPs.

4.3.3 Section 404 of the Clean Water Act

Section 404 of the Clean Water Act prohibits the discharge of dredged materials into the waters of the U.S., which include non-navigable streams, wetlands and mudflats, unless the U.S. Army Corps of Engineers (USACE) provides a permit. On March 27, 2021, USACE and HDOT visited the site to determine if any wetlands would be impacted by the proposed project. Although wetlands had been mapped in the area by the Fish and Wildlife Service Mapping Tool, these maps are very generalized, and no wetlands were identified. A formal wetland delineation conducted in accordance with the *U.S. Army Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and the Pacific Islands (version 2.0)* on November 11, 2021 indicated that there are no wetlands present within the project footprint or study area. The report for the jurisdictional determination (Appendix L) has been prepared and coordination with the U.S. Army Corps of Engineers is ongoing.

4.3.4 Shoreline and Coastal Area Coordination

The Office of Conservation and Coastal Land (OCCL), Office of State Planning (OSP) and the City and County of Honolulu's Department of Planning and Permitting (DPP) administer various aspects of the shoreline and coastal zone regulations. As variations of this project have been ongoing for many years, there have been several lines of consultation with OCCL, OSP, and the and Permitting (DPP). Meeting summaries and letters are in Appendix A-63.

- HDOT met with OCCL on June 8, 2011 as the project was being initiated.
- On May 23, 2017 the DPP responded to HDOT's request for information noting that both the "Minor" and 'Most' realignments were in the SMA, and the project would be considered development.
- On August 7, 2017, the OSP wrote HDOT with the requirements for CZM coordination and comments on the "Minor" and "Most" Realignments.
- On September 29, 2017 HDOT met with OSP and OCCL to discuss their views on the project alternatives. Their concerns focused on sea level rise and maintaining beach access.
- On October 25, 2017, OCCL wrote to HDOT expressing support for the "Most" alternative and describing issues with sea level rise.
- On October 8, 2019, HDOT met with OCCL and DPP to update the agencies on changes to the project purpose and need and design alternative, as well as to discuss regulatory compliance options.
- On October 5, 2021, HDOT met with OCCL and DPP to clarify comments on the Draft EA and coordinate permitting expectations.

Section 1.5 details the project history and iterative process undertaken to obtain a certified shoreline.

5.0 FINDING OF NO SIGNIFICANT IMPACT

In accordance with HRS Chapter 343 and HAR, Sections 11-200.1-19, HDOT is issuing a Finding of No Significant Impact (FONSI) for the proposed project. This assessment is 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 is discussed in detail in Chapter3.

1. *Involves an irrevocable commitment to loss or destruction of any natural, cultural or historic resource* – The Pedestrian Shift Alternative was selected because it avoids impacts to cultural resources. Impacts, as described in Section 3.3, to Lauhulu Stream Bridge (also called Laniakea Stream Bridge) are not considered irrevocable because the impacts are related to its historical function as a road. The project actions do not irretrievably modify the bridge in such a way that it could never be returned to its historical use for transportation.

   As described in Section 3.5, the proposed project is not likely to affect the plant and wildlife resources of the area, especially any threatened or endangered species, or species of concern. Much of the plant and bird species observed within the project area are introduced. The proposed project will allow the plants mauka of the existing Highway to regrow as cars will no longer be parking in the area. Pavement removal and re-vegetation at the makai side of Kamehameha Highway will promote long-term restoration of the beach ecosystem, resulting in beneficial impacts to wildlife.

2. *Curtail the range of beneficial uses of the environment* – The proposed project will not curtail the range of beneficial uses of the environment. Long-term, access to the beach will be improved by removing conflicts between beach access and highway operations. Public access to City DPR's parking area will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction. Beachgoers can still use alternative modes of transportation (bus, bicycle, walk) or park at a different location.

3. *Conflicts with the State's environmental policies or long-term goals established by law* – The proposed project is consistent with the environmental goals and objectives of the State of Hawaii, as demonstrated in Section 3.17.

4. *Have a substantially adverse effect on the economic welfare, social welfare, or cultural practices of the community and State* – The proposed project will not adversely affect the economic welfare, social welfare, or practices of the community and State. Instead, it will support and enhance the Island's economy and quality of life by contributing to the reliability of the transportation network. The Pedestrian Shift Alternative will help to alleviate frequent roadway flooding and prevent a catastrophic closure of the Highway, as well as mitigate the frequent congestion on Kamehameha Highway.

5. *Have a substantially adverse effect on public health* – The proposed project enhances safety for pedestrians and motorists and will not adversely affect public health.

6. *Involves adverse secondary impacts such as population changes or effects on public facilities*– As described in Section 3.18.1, the proposed project will not induce growth nor will it result in related long-term adverse secondary impacts that will otherwise not occur.
7. *Involves substantial degradation of environmental quality* – The proposed project will not result in a substantial degradation of environmental quality. The project will not result in adverse environmental conditions, as demonstrated in Chapter 3.
8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions* – The proposed project will not create a commitment for other actions by HDOT, another government agency, or other party. The proposed project is a complete, independent project, with logical termini, and will not result in commitments for other roadway projects, nor result in cumulative, considerable effect on the environment.
9. *Substantially affects a rare, threatened, or endangered species or its habitat* –As described in Section 3.5 and biological studies conducted for the project (Appendix E), no interactions with protected species is likely to occur. Construction activities are not anticipated to occur where the sea turtles rest. Standard Best Management Practices (BMPs) will be employed to protect seabirds, hoary bats, and sea turtles if night time construction is warranted (See Section 3.17).
10. *Have a substantial adverse effect on air or water quality or ambient noise levels* – The proposed project will not have an adverse effect on air or water quality or noise levels. No violations of State or National Ambient Air Quality Standards will be cause by the proposed project. Storm water control BMPs will be implemented during project construction in order to minimize water quality impacts from construction site run-off. Naturalization of portions of the existing highway and permanent BMPs installed by the project will help to reduce storm water run-off and improve overall water quality. No adverse noise impacts are anticipated.
11. *Have a substantial adverse effects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters* – The Pedestrian Shift Alternative delays the consequences of sea level rise and will help protect Kamehameha Highway at Laniakea from flooding, tsunami, and from being undermined by erosion.
12. *Have a substantial adverse effect on scenic vistas and view planes, during day or night, identified in county or state plans or studies* –The Pedestrian Shift Alternative will continue to provide a view of the beach for drivers while pedestrians and cyclists will enjoy the view from the existing road.
13. *Requires substantial energy consumption or emit substantial greenhouse gases* – The proposed project will not result in substantial energy consumption. While there will be short-term construction-phase energy consumption, it will be offset by the anticipated long-term benefits as vehicular traffic is able to travel more efficiently on Kamehameha Highway.

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Appendix

A

Consultation, and Correspondence

Appendix

A-1

Pre-Scoping for Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach

The following agencies, elected officials, organizations, and others were contacted by email on January 26, 2021 and post mail between February 2 and 3, 2021. A copy of the letter is included. The recipients are listed below. An asterisk (*) appears next to those entities that responded to the letter.

Responses to scoping requests helped to inform preparation of this Draft EA.

<u>Federal Agencies</u>

U.S. Army Corps of Engineers, Honolulu District Regulatory Branch

U.S. Department of Agriculture, National Resource Conservation Service

U.S. Department of Commerce, National Oceanic and Atmospheric Administration

U.S. Department of the Interior, U.S. Fish and Wildlife Service

U.S. Department of the Interior, U.S. Geological Survey

U.S. Environmental Protection Agency (EPA), Pacific Islands Contact Office

U.S. EPA, Region IX

U.S. Federal Emergency Management Agency (FEMA), External Affairs Director

U.S. FEMA, Floodplain Management and Insurance Branch**

U.S. FEMA, Mitigation Outreach Specialist

U.S. FEMA, Office of Natural and Technological Hazards Program

<u>State of Hawaii Agencies</u>

Department of Accounting and General Services*

Department of Agriculture*

Department of Budget and Finance

Department of Business, Economic Development & Tourism (DBEDT)

DBEDT, Office of Planning

Department of Defense

Department of Education

Department of Hawaiian Home Lands

Department of Health

Department of Land and Natural Resources (DLNR)

DLNR, Division of State Parks

DLNR, Engineering Division

DLNR, Office of Coastal and Conservation Lands

DLNR, State Historic Preservation Division

Office of Hawaiian Affairs

<u>City and County of Honolulu Agencies</u>

Honolulu Board of Water Supply*

Department of Design and Construction*

Department of Emergency Management*

Department of Environmental Services*

Department of Land Management*

Department of Parks and Recreation*

Department of Planning and Permitting*

Department of Transportation Services *

Emergency Services Department (ESD)*

ESD, Ocean Safety Division*

Honolulu Fire Department*

Honolulu Police Department*

Office of Climate Change, Sustainability and Resiliency

Office of Economic Development

Office of Economic Revitalization

Elected Officials

Honolulu City Councilmember Brandon Elefante, Chair, City Council Transportation Committee

Honolulu City Councilmember Carol Fukunaga, Chair, Committee on Public Infrastructure and Technology

Honolulu City Councilmember Heidi Tsuneyoshi, District 2

Honolulu City Councilmember Kathleen Pahinui, Neighborhood Board No. 2

Honolulu City Councilmember Radiant Cordero, Chair, Committee on Transportation, Sustainability and Health

Mayor Rick Blangiardi, City and County of Honolulu

State Representative Angus L.K. McKelvey, Chair, House Committee on Economic Development and Business

State Representative Cedric Asuega Gates, Chair, House Committee on Culture, Arts, and International Affairs

State Representative David Tarnas, Chair, House Committee of Water and Land

State Representative Henry J.C. Aquino, Chair, House Committee on Transportation

State Representative Mark Nakashima, Chair, House Committee on Judiciary and Hawaiian Affairs

State Representative Richard H.K. Onishi, Chair, House Committee on Tourism and International Affairs

State Representative Ryan Yamane, Chair, House Committee on Water, Land, and Hawaiian Affairs

State Representative Sean Quinlan, District 47, Chair, House Committee on Economic Development

State Representative Scott Saiki, Speaker of the House

State Representative Sylvia Luke, Chair, House Committee on Finance

State Senator Chris Lee, Chair, Senate Committee on Transportation

State Senator Clarence Nishihara, Chair, Senate Committee on Public Safety, Intergovernmental and Military Affairs

State Senator Donovan M. Dela Cruz, Chair, Senate Committee on Ways and Means

State Senator Gil Riviere, District 23*

State Senator Glenn Wakai, Chair, Senate Committee on Energy, Economic Development and Tourism

State Senator Kaialai`i Kahele, Chair, Senate Committee on Water and Land

State Senator Lorraine R. Inouye, Chair, Senate Committee on Water and Land

State Senator Malie S.L. Shimabukuro, Chair, Senate Committee on Hawaiian Affairs

State Senator Ronald D. Kouchi, Senate President

U.S. Representative Ed Case

U.S. Representative Tulsi Gabbard

U.S. Senator Brian Schatz

U.S. Senator Mazie Hirono

Utilities

Charter Communications/ Spectrum*

Hawaiian Electric Company*

Community and Other Organizations

Angelica’s Family LTD Partner

Camp North Shore LLC

Chamber of Commerce Hawaii

Council for Native Hawaiian Advancement

Covenant Group Inc.

DCGC LLC

Defend Oahu Coalition

Discover Hawaii Tours

D. Sack Family LTD Partnership

E Noa Corporation

E Pili Kakou LLC.

E Pili Kaua LLC.

Foodland Delivery

Grabber Building LLC.

Hawaii Bicycling League

Hawaii Lodging and Tourism Association

Hawaii Maoli

Hawaii Transportation Association

Hawaii Tourism Authority

Hawaii Visitors and Convention Bureau

Hawaii’s Thousand Friends

Historic Hawaii Foundation

Kaalakea Kai Estates

KAHEA

Ka Hoku Hawaii LLC.

Kalekai Properties LLC.

Kamehameha Schools*

Keep the North Shore Country

Kokua Hawaii Foundation

Life of the Land

Malama na Honu

Malama Pupukea-Waimea

Native Hawaiian Economic Alliance

North Shore Chamber of Commerce*

North Shore Community Land Trust

North Shore Lifeguard Association

Oahu Nature Tours

Oni Kai LTD Partnership

Polynesian Adventure Tours

Polynesian Hospitality

Punalau LLC

Ralston Development Corp

Roberts Hawaii

Save Our Surf**

Save the Sea Turtles International

Sierra Club

Surfrider FOundation

The Surf Bus

Travel Plaza Transportation, LLC

Waialua Community Association

Waialua Hawaiian Civic Club

Waialua Oceanview LLC.

Waihuena Farm

Residents, Trusts, and Other Individuals

AMP I

Ann, Leslie, and Lucas Chung

Audry and Steven Yuh Trust

Beverly A. Fettig Trust

Carl Hodel Trust

Charles and Eleni Pfluger

Curtis and Craig Kamisugi

Dan Dillon Trust
Dennis Pettigrow Trust
D.G. Anderson Trust
Diane Peck Trust
Eastern Skateboard Supply Inc.
Edwin and Rebecca Gonzales Trust
Ernesto Simoes & Francine Beckhauser Trust
Fe Asia and Robert Medoff
Fitzgerald Trust
George E. K. Awai Trust
Gillard Family
Guy Tucker Trust
Honu Pacific Surf LLC.
Ishii Trust
James KB & Muriel L Fong Trust
Jason D. Seymour Trust
Jeffery, Michael, and Sandra Jordan
Jeri Lynch Trust
Joao Jabour Trust
John and Etsuko Carper Trust
Joseph and Lyndsey Ekstrom Trust*
Joyce and Michael Farrell Trust
JSP I
Juliana Sanvold Trust
Kelley and Wesley Huggett
LSW Hawaii LLC.
Marcelino Apilado
Marguerite & William Paty Jr. Trust
Marina Whyte Trust
Martha Laxson Trust
Maude M. Silva Trust

Mellissa Dawson Trust
Ms. Anita Apilado
Michael and Christina Fisher
Mr. & Mrs. Alvin and Barbara Santos
Mr. & Mrs. Andrew and Jill Cannon
Ms. Antya Miller
Ms. Barbara Fowls
Ms. Barbara Picayo
Mr. Beau Sheil*
Mr. Bernie Moriaz
Mr. Bill Quinlan*
Mr. Bob Leiman
Mr. Bob Leinau*
Mr. Bob Thorp
Mr. & Mrs. Brett & Dianne Thomas*
Mr. Brian Emmons*
Ms. Carina Cooper
Ms. Carol Philips
Ms. Carolyn Sandian
Ms. Carolyn Sandison
Ms. Cece Bulkley
Mr. Chris Gardner
Ms. Clara Yokotake
Ms. Connie Gazman
Mr. Dale Bordner
Mr. Dale Moore
Mr. David Fisher*
Mr. David T. Tamura
Ms. Deborah Aldrich*
Mr. Dennis Reuter
Ms. Diane Anderson*

Mr. Dolan Eversole
Mr. Douglas Cole
Mr. Douglas Meller**
Ms. Elenore Yuki Goto
Ms. Ellen Fooks
Mr. & Mrs. Fellisimma and Robin Albios
Mr. George Ai
Mr. Gordon Merchant*
Ms. Grace K. Terashima
Mr. & Mrs. Hans and Karin Hedermann*
Mr. Ivan K. Asano
Mr. James Haas
Mr. James T. Eichler
Mr. & Mrs. James and Michelle Hawkins
Mr. & Mrs. James and Molly Lewis
Ms. Jean Martinson
Mr. Jeremy M. Mirels
Ms. Jessica Malcolm
Ms. Jill Cannon
Mr. John DeSato
Mr. John Desoto
Mr. John R. Kleiser
Mr. John Theilst
Mr. Joseph Whitmarsh
Ms. Julia Hirayama
Ms. Karen Gallegher
Ms. Kathleen Gustine
Mr. Kawika Au
Mr. Kenneth Walsh*
Ms. Laura Figueira
Ms. Laura Purdy
Ms. Laura Taylor
Mr. Leland H. Dao
Ms. Lori Watts
Ms. Lorna C. Jensen
Ms. Luann Casey
Ms. Malia Evans
Ms. Marina Hoshi Whyte*
Ms. Mary Lagues
Ms. Mellissa Ginella
Mr. Michael Berman**
Mr. Michael Horack
Mr. Michael Lyons**
Ms. Mikela K Keawe
Mr. Noah Johnson
Mr. Paul Sensano
Mr. Ralph Inouye
Mr. Randy Rarick
Mr. Reed Matsuura
Ms. Reena Shah
Mr. Richard Sterman
Mr. Richard Whyte*
Mr. Robert Robinson*
Mr. Robert Singlehurst
Ms. Robyn Keller
Mr. Saipele Manutai
Ms. Sandra Cayocca-Cunha
Mr. Scott Brewer
Ms. Tammy Escorzon
Ms. Tina Jensen*
Mr. Warren Scoville
Mr. William Martin

Oleema Miller
Pacific Return LLC
Paul and Anissa Balson Trust
Pavsek Family Trust
Paul and Sharon Loughran Trust
Peter Dawson Trust
Robert and Adrienne Morine Trust
Robert and Linda Thorp
Robert Brooks Trust
Ron and Theresa Hansen Trust
Ronald Hill & Borinne K.C. Trust
Ryan and Shauna Ockey
Scott C. Wallace Trust
Scott and Diana Foster Trust
Sheil Family Trust
Silvia Donahue Trust
Susan and Alexander Hendry Jr. Trust
Syren I
Therese A. Boe Trust
Thomas Jacobs Trust
Warren D. Coley Trust
Wilcox Family Trust
William Eilert Trust*

DAVID Y. IGE
GOVERNOR

JADE BUTAY
DIRECTOR

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

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

IN REPLY REFER TO:
HWY-PA 2.5136

January 26, 2021

Subject: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing to realign Kamehameha Highway in the vicinity of Laniakea Beach (Figure 1). The primary purpose of the project is pedestrian safety. Previously, HDOT considered other project alternatives designed to protect the highway from wave-driven erosion and keep it operational as part of the overall transportation system in the area. However, HDOT re-prioritized safety as the project's primary objective in response to community outcry when a pedestrian was struck by a vehicle in August 2019. This re-prioritization led to re-evaluation of project alternatives. These new project alternatives, as presented in this letter, are designed to protect pedestrians and, as a secondary benefit, would help protect the highway from shoreline erosion.

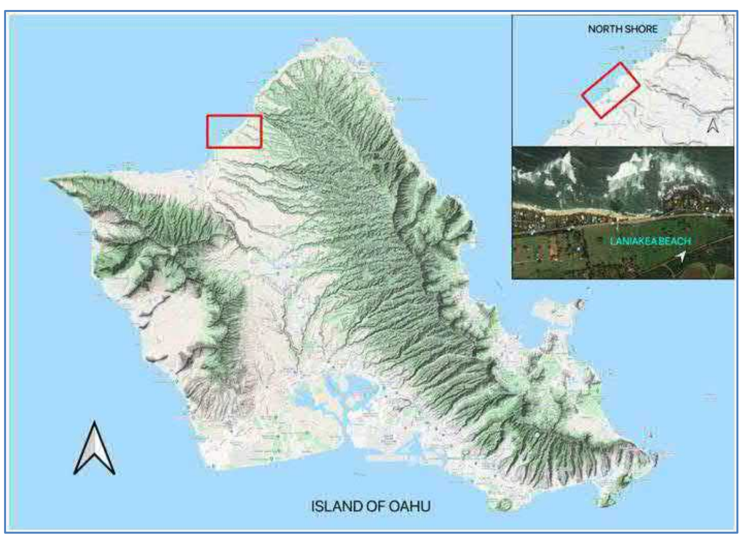

Figure 1. Project Location

HDOT has been coordinating with the community since 2011 to address concerns regarding Kamehameha Highway in the vicinity of Laniakea Beach and has developed the current project based on input provided by stakeholders. The community has endured years of traffic congestion on Kamehameha Highway created by people parking on the mauka side of the highway and crossing to see the turtles. Additional community concerns are specific to people attempting to cross the highway and the safety issues involved due to the lack of an organized crossing system. Input into the project design alternatives was gathered during meetings with affected individual land owners and residents, as well as meetings with City and State agencies.

HDOT is preparing an EA to evaluate the proposed project. There are four potential alternatives being evaluated for which we would like your input: the No Build Alternative, the No Build Settlement Alternative, the Transportation System Management Alternative, and the "Pedestrian Shift" Alternative.

No Build Alternative

The No Build Alternative is the existing condition or "do nothing" approach. It would leave the project area as it is with no changes to the transportation infrastructure. See Figure 2 and Figure 3.

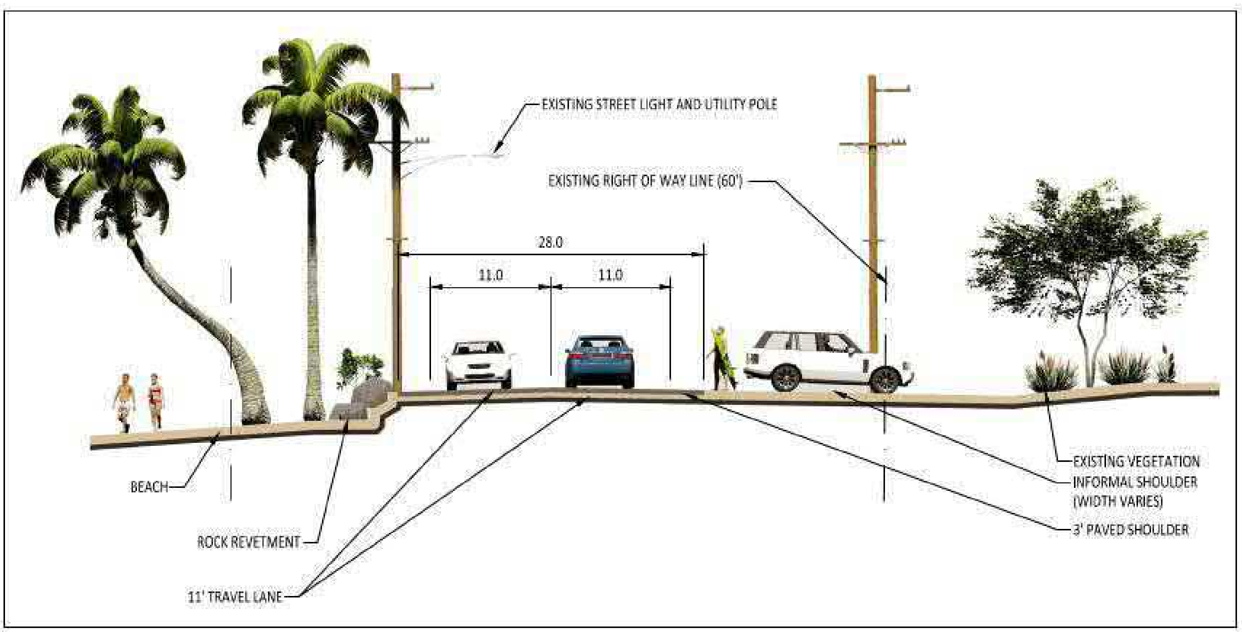

Figure 2. Existing Typical Section/No Build Alternative

Figure 3. Existing Plan View/No Build Alternative

No Build Settlement Alternative

As reported in Civil Beat on July 9, 2020, an interim solution to address access and safety issues along the Laniakea corridor was reached in a court settlement on June 17, 2020. This scenario is considered a "No Build" because this condition would be implemented by an entity other than HDOT. It represents another potential outcome of the "do nothing" alternative.

While there is no schedule for the agreement's implementation, the changes established in the settlement will be addressed in the EA as an alternate scenario for the No Build Alternative. The settlement was reached after a group of North Shore residents, activists, and surfers litigated HDOT over the placement of barriers along the mauka side of Kamehameha Highway in 2014.

The settlement involves allowing cars to park on the mauka side of the highway for better public access to Laniakea Beach, and installing guardrails and crosswalks so that visitors might cross the highway in a safer, more orderly fashion. See Figure 4 and Figure 5. Cars will enter the parking area on the Haleiwa side and exit on the Waimea side. In addition, the City and County of Honolulu will move a cattle fence on its property mauka of the highway so that cars have room to maneuver and park. The agreement further prohibits the large tour buses and vans that often shuttle tourists to Laniakea from stopping there. The settlement agreement calls for a one-year trial period, but there is no deadline for the changes to take place.

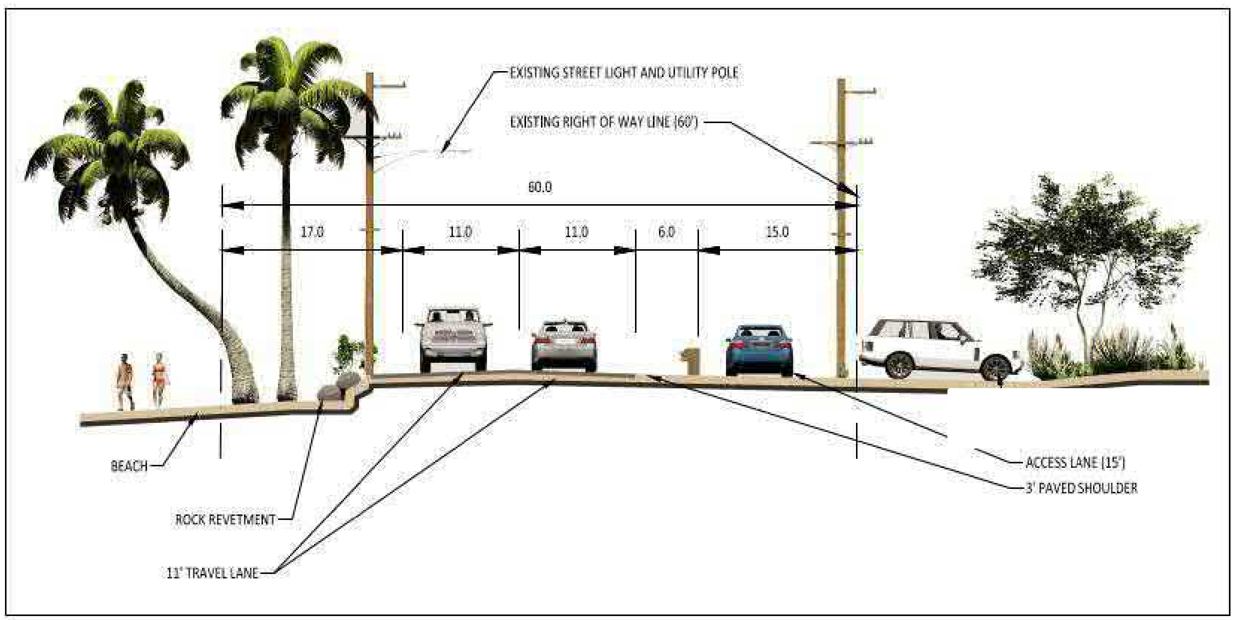

Figure 4. No Build Settlement Section

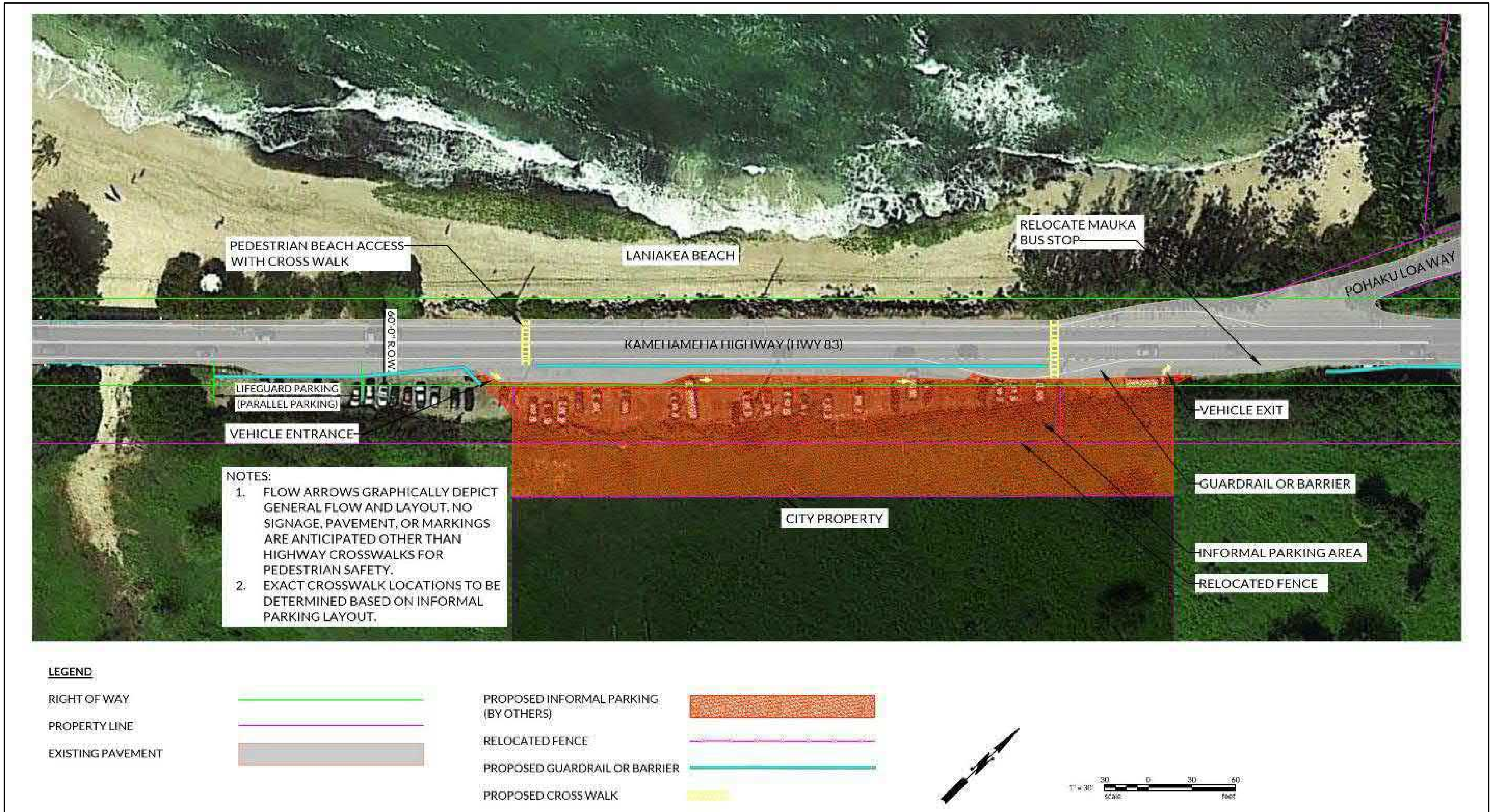

Figure 5. No Build Settlement Plan View

Transportation System Management Alternative

The Transportation System Management Alternative (TSM) would entail blocking off the mauka side parking with a permanent guardrail. The guardrail would be in a similar location as the concrete barriers that were installed in 2014. See Figure 6 and Figure 7.

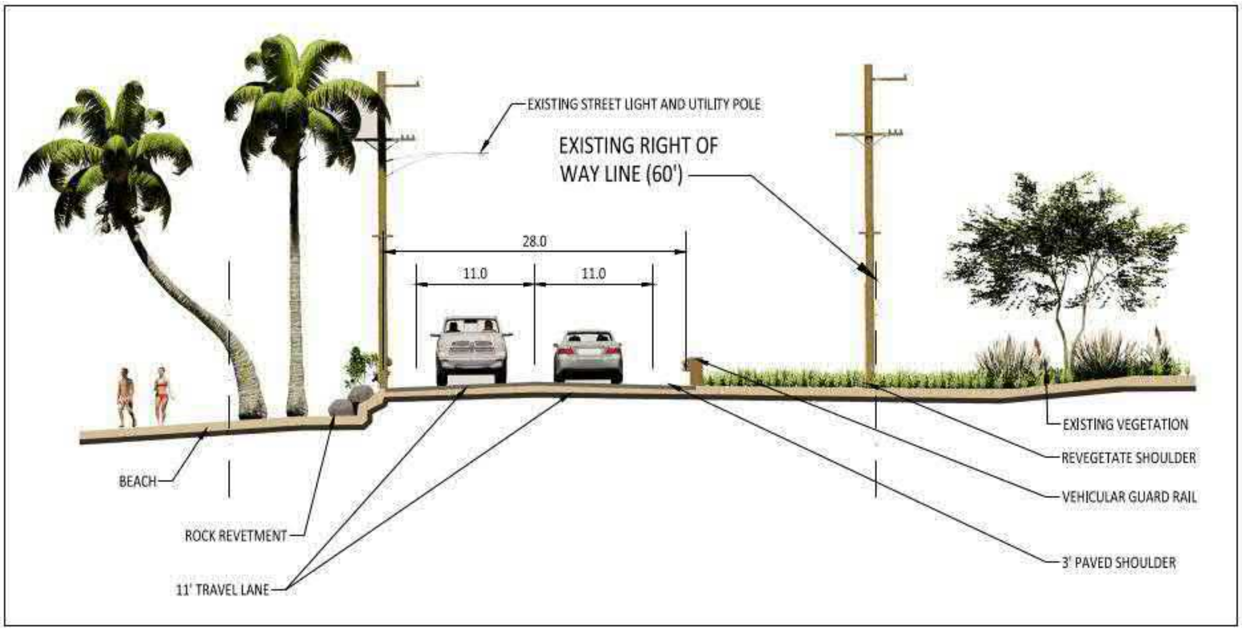

Figure 6. Typical Section – TSM Project Alternative Section

Figure 7. Plan View – TSM Project Alternative Section

"Pedestrian Shift" Alternative

The "Pedestrian Shift" Alternative generally consists of realigning Kamehameha Highway mauka roughly 80 feet from its current location, with the realignment beginning from the Haleiwa side of Laniakea Stream Bridge to the Haleiwa side of Kawailoa Stream Bridge, a distance of roughly 0.5 miles. See Figure 8 and Figure 9 for the proposed realignment.

Because the road would be shifted and guardrails installed, there would be no open area for parking on the mauka side and the ability to park and attempt to cross the road would be removed. Informal parking would be accommodated on the makai side of the highway. Components and details of this alternative would include:

- A highway right-of-way that is generally 120-feet wide with two 12-foot wide through lanes (one in each direction) and a 10-foot wide median refuge lane for part of the realigned distance.
- A normal asphalt road structure with provisions on the makai edge to reduce the potential of soil erosion from under the roadway.
- Vehicular guardrails to prevent parking on the mauka side of the shifted highway.
- Existing cross streets and driveways would be modified to allow access to the realigned Kamehameha Highway and vehicle control gate at Pohaku Loa Way.
- Street lights on the mauka side of the highway.
- One new bridge at Laniakea Stream on the mauka side of the existing Laniakea Stream Bridge.
- Converting one lane of the existing Kamehameha Highway to a 16-foot wide shared use path for bicycles and pedestrians. The other lane would be partially removed and revegetated.

As this alternative would take a few years to design and construct, guardrail would be installed along the mauka edge of the existing highway for the length of the project to protect the construction work area while the highway is realigned.

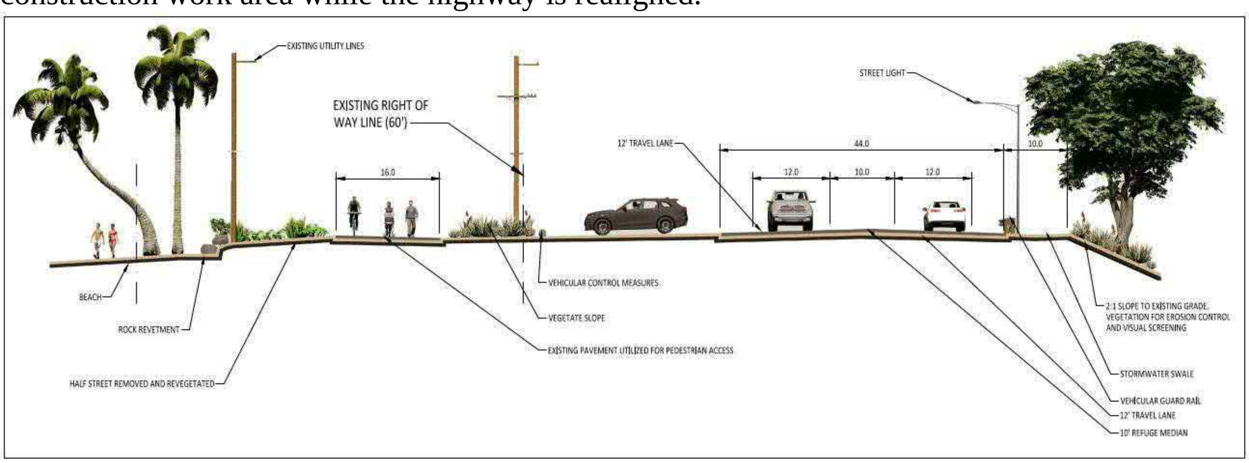

Figure 8. "Pedestrian Shift" Alternative Alignment Section

Figure 9. "Pedestrian Shift" Alternative Plan View

Request for Input

At this time, we do not intend to relocate any utilities, as they would remain within the existing Kamehameha Highway right-of-way. We welcome any comments or input you may have regarding the proposed project. Information gathered during this process will assist us in evaluating the alternatives and preparing the Draft EA. The same project information can be found at the project website, http://www.laniakearealignment.com; updates will be posted accordingly.

To comment on the project, please provide a written response within 30 days of the date of this letter to Brian Tyau via email at Brian.Tyau@hawaii.gov or by U.S. Postal Service to Department of Transportation, 869 Punchbowl Street, Room 301, Honolulu, Hawaii 96813.

Sincerely,

KEN K. TATSUGUCHI
Engineering Program Manager
Highways Division
Planning Branch

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

February 17, 2021

Brian Tyau
Department of Transportation
869 Punch Bowl Street, Room 307
Honolulu, Hawaii 96813

Dear Mr. Tyau:

This is in response to your request for comments regarding the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach, Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments Haleiwa Island, Oahu Hawaii.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the City and County of Honolulu (Community Number 150001), Maps revised November 5, 2014. Please note that the City and County of Honolulu, Hawaii are participants in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The City and County of Honolulu floodplain manager can be reached by calling Mario Siu Li, NFIP Coordinator, at (808) 768-8098.

If you have any questions or concerns, please do not hesitate to call Serena Cheung at (510) 627-7113 or Michael Hornick at (510) 627-7260 of the Mitigation staff.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Mario Siu Li, NFIP Coordinator, City and County of Honolulu
Carol Tyau-Beam, NFIP State Coordinator, State of Hawaii
Serena Cheung, NFIP Floodplanner, DHS/FEMA RIX
Michael Hornick, NFIP Floodplanner, DHS/FEMA RIX
Alessandro Amaglio, Environmental Officer, DHS/FEMA RIX

Mario Siu Li msiuli@honolulu.gov
Carol Tyau-Beam carol_l_tyau@hawaii.gov
Serena Cheung Serena.Cheung@fema.dhs.gov
Michael Hornick Michael.Hornick@fema.dhs.gov
Alessandro Amaglio Alessandro.Amaglio@fema.dhs.gov
Brian Tyau Brian.Tyau@hawaii.gov

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor

PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

MORRIS M. ATTA
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

January 29, 2021

TO: Ken K. Tatsuguchi
Engineering Program Manager
DOT-Highways Division
Planning Branch

ATTN: Brian Tyau

FROM: Phyllis Shimabukuro-Geiser *Phyllis Shimabukuro-Geiser*
Chairperson, Board of Agriculture

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft EA Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

The Hawaii Department of Agriculture (HDOA) appreciates the information you provided on the above-mentioned project. However, the HDOA has no comments to provide on the pre-draft environmental assessment.

Thank you.

Island Fresh

DAVID Y. IGE
GOVERNOR

CURT T. OTAGURO
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)21.017

FEB 10 2021

MEMORANDUM

TO: Brian Tyau, Advance Planning Engineer
Department of Transportation

FROM: Christine L. Kinimaka
Public Works Administrator

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

Thank you for the opportunity to provide comments on the subject project at this pre-draft EA stage. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, your staff may call Mr. Dennis Chen of the Planning Branch at 586-0491.

DE:mo
c: Ken K. Tatsuguchi, DOT

BOARD OF WATER SUPPLY

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

February 26, 2021

Mr. Ken K. Tatsuguchi
State of Hawaii
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Attention: Brian Tyau

Dear Mr. Tatsuguchi:

Subject: Letter Dated January 26, 2021 Requesting Comments on the Pre-Draft Environmental Assessment on the Proposed Kamehameha Highway Pedestrian Safety Project in the Vicinity of Laniakea Beach in Haleiwa

The Board of Water Supply has several water transmission mains along Kamehameha Highway in vicinity of Laniakea Beach. We also have water system replacement projects along Kamehameha Highway – Haleiwa Water Systems Improvements, Part I & II in the vicinity of the project site. These projects are currently in the design phase and are tentatively scheduled to be completed in Fiscal Year 2023. Please coordinate with the Design Branch of our Capital Projects Division at 748-5710.

Due to the nature of the proposed realignment alternative, there are many unforeseen circumstances and uncertainties regarding new roadway ownership, public right-of-ways, and water system reliability for existing customers with water service meters along Kamehameha Highway. Existing water mains should be located within paved public right-of-ways and be made accessible for repairs and maintenance. Any structures should be adequately set back from the water main easements for the safety of the public and to prevent damage to any structures in the event of main breaks, repair, and maintenance.

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

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

We reserve further comment until the Draft Environmental Assessment has been submitted for our review and approval.

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

Very truly yours,

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

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

RICK BLANGIARDI
MAYOR

ALEX KOZLOV, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

February 22, 2021

SENT VIA EMAIL

Mr. Brian Tyau
Brian.Tyau@hawaii.gov

Dear Mr. Tyau,

Subject: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment. Our Facilities Division has the following comments.

> It should be pointed out that for the no-build settlement alternative, the City has removed the cattle fence and gate. Also, the City has installed a new chain link fence mauka of the cattle fence. This completed the City's portion of the settlement. The remaining work, which includes the guard rail, signage, and crosswalk, are to be installed by the State.

Should you have any further questions, please contact Clifford Lau, Facilities Division Chief at 768-8483.

Sincerely,

for Alex Kozlov, P.E.
Director

AK:cf (839720)

From: Jacinto-Kawabata, Marie <m.jacinto-kawaba@honolulu.gov>
Sent: Monday, February 8, 2021 10:56 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach

Aloha Mr. Tyau,

We received the Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach Pre-Draft Environmental Assessment (EA).
Director Hiro Toiya has no comments.

Mahalo,

Marie Jacinto-Kawabata
Clerk
City & County of Honolulu
Department of Emergency Management
(808) 723-8960

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 308, KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3486 ● FAX: (808) 768-3487 ● WEBSITE: http://envhonolulu.org

RICK BLANGIARDI
MAYOR

WESLEY T. YOKOYAMA, P.E.
DIRECTOR DESIGNATE

MICHAEL O'KEEFE
DEPUTY DIRECTOR

ROSS S. TANIMOTO, P.E.
DEPUTY DIRECTOR

IN REPLY REFER TO:
PRO 21-009

February 9, 2021

VIA EMAIL: **Brian.Tyau@hawaii.gov**

Mr. Ken K. Tatsuguchi, Engineering Program Manager
State of Hawaii, Department of Transportation
Highways Division, Planning Branch
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Attention: Mr. Brian Tyau

Dear Mr. Tatsuguchi:

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and
Request for Comments
Haleiwa, Island of Oahu, Hawaii

We have reviewed your letter dated January 26, 2021, ref. no. HWY-PA-2.536. The Department of Environmental Services has no comment as the proposed project will have no impact on any of our programs and facilities. You may remove us as a consulted party for the balance of the Environmental Assessment process.

Should you have any questions, please contact Marisol Olaes, Civil Engineer, at 768-3467.

Sincerely,

Wesley T. Yokoyama, P.E.
Director Designate

DEPARTMENT OF LAND MANAGEMENT

CITY AND COUNTY OF HONOLULU

558 SOUTH KING STREET • HONOLULU, HAWAII 96813
PHONE: (808) 768-4277• FAX: (808) 768-4296 • INTERNET: http://www.honolulu.gov/dlm

RICK BLANGIARDI
MAYOR

SCOTT K. HAYASHI
DIRECTOR DESIGNATE

February 1, 2021

Mr. Brian Tyau
State of Hawaii
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Tyau:

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

Thank you for the notice on the Pre-Draft Environmental Assessment that has been done for the Kamehameha Highway Pedestrian Safety Project. At this time, we have no comments as there are no direct impacts to any of our existing or proposed projects.

The City currently owns parcels of land adjacent to the project site. For that, we are interested in any updates and/or developments moving forward.

If you have any questions, please contact Seiji Ogawa, Project Manager, by telephone at 768-4294 or by email at seiji.ogawa@honolulu.gov.

Sincerely,

Scott K. Hayashi

Scott K. Hayashi
Director Designate

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

RICK BLANGIARDI
MAYOR

LAURA H. THIELEN
DIRECTOR

MICHELE K. NEKOTA
DEPUTY DIRECTOR

February 19, 2021

Mr. Brian Tyau
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813
Brian.Tyau@hawaii.gov

Dear Mr. Tyau:

SUBJECT: Kamehameha Highway Pedestrian Safety Project –
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA)
Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

This letter responds to letter dated January 26, 2021 from Ken K. Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch, Department of Transportation (HDOT) requesting comments from the Department of Parks and Recreation (City) to HDOT's four potential alternatives it is evaluating in preparation of the environmental assessment for the above project.

Comments Regarding No Build Alternative (Option 1)

We have no comments.

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there's more!
KT

Comments Regarding No Build Settlement Alternative (Option 2)

After consultation with our legal counsel, we suggest that the HDOT consult with the Department of the Attorney General (AG) concerning the disclosure of the information summarized in your letter concerning Option 2. The summary description of Option 2 appears to mischaracterize the proposal considered by the parties and the negotiations in Reno Abellira, et.al. vs. State of Hawaii Department of Transportation, et. al., Civil Nos. 14-1-005-01 and 15-1-1569-08. We also have been advised that the Court has not approved a final settlement in the foregoing matter and resolution of the lawsuit remains ongoing. HDOT should further consult with the AG on the distribution of the information described in Option 2 which is part of ongoing confidential negotiations and not subject to public dissemination.

In response to your request for comments, the City supports Option 2 as negotiated and agreed to by the parties in the lawsuit which imposes the duty upon the City to make improvements to its property and imposes the duty upon HDOT to make improvements along Kamehameha Highway, including the installation of guard rails, crosswalks, and appropriate signage.

Comments Regarding the Transportation System Management Alternative (Option 3)

This option involves blocking off the mauka side parking with a permanent guardrail or barrier. There will be no public parking in this vicinity. The Department of Parks and Recreation would need access to periodically maintain its property on the mauka side of the highway.

Comments Regarding "Pedestrian Shift" Alternative (Option 4)

This option involves the highway shift approximately 80 feet into City property and the City should be properly compensated. This would be a State initiative and the City's only involvement would be to allow the State to use and/or condemn this parcels for this use.

Other than the foregoing comments, the City remains committed to complying and implementing the proposal negotiated in the Reno Abellira matter.

Thank you for the opportunity to provide comments. Should you have any questions concerning the foregoing, please do not hesitate to contact the undersigned at 768-3001.

Sincerely,

Laura H. Thielen
Director

cc: Mr. Ken K. Tatsuguchi
Engineering Program Manager
Department of Transportation
Highways Division
Planning Branch

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

RICK BLANGIARDI
MAYOR

DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

March 4, 2021

2021/ELOG-238(LP)

21 MAR -8

Mr. Brian Tyau
Engineering Program Manager
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Tyau:

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Pre-Draft Environmental Assessment
Vicinity of Laniakea Beach

This is in response to your letter, received February 3, 2021, requesting comments on the Pre-Draft Environmental Assessment (EA) for the subject Project. Specifically you would like input on the four potential alternatives proposed. The following are our comments:

1. The Project site is within the Special Management Area (SMA) and additional information is needed to determine if an SMA Use Permit is required for the different Project alternatives.

2. The Draft EA should disclose how the various project alternatives will be consistent with Hawaii Revised Statutes Section 205A-2 and Chapter 25, Revised Ordinance of Honolulu (ROH). The Draft EA should also identify any significant adverse environmental or ecological effects and specify which elements of the Project would be considered "development" for purposes of Section 25-1.3, ROH.

3. The Draft EA should discuss Chapter 23, ROH and reference the shoreline survey certified for the site on July 30, 2020. The Draft EA should describe and include a figure clearly showing for each alternative which elements of the Project would be makai of the certified shoreline or within the shoreline setback.

4. The Draft EA should include a discussion of any other land use permits anticipated to be required prior to Project implementation.

5. Our records indicate that Laniakea Stream runs through the area, and the stream is considered an "Estuarine Marine Wetland." Therefore, the Draft EA should discuss any activities in this area, any potential impacts to stream waters or wetlands that may occur as a result of the Project, and proposed mitigation measures.

6. Regarding the four project alternatives, we have the following comments:

   a. No Build Alternative: This alternative is not preferred as your analysis indicates it would be unsafe for pedestrians.

   b. No Build Settlement Alternative: Part of this alternative has been completed. Special Management Area Permit Minor No. 2020/SMA-38 and Minor Shoreline Structure Permit No. 2020/MSS-4 were issued by the Department of Planning and Permitting on December 7, 2020 to allow fencing within the City Properties identified as Tax Map Keys 6-1-005: 024, 6-1-009: 024, and 6-1-010: 019. The fence construction has been completed.

   c. Transportation System Management Alternative: The Draft EA should discuss how public access to Laniakea Beach Park would be accommodated under this alternative. Discussion should include any proposed parking location and how the public would access the beach park from the parking location. Based on the previous location of the jersey barriers, it appears this alternative would have a similar impact on traffic and the beach park uses. Therefore, the Draft EA should include a summary and analysis of the information gathered during that time. This section should also discuss how this alternative meets the HRS 205A and Chapter 25, ROH objectives to ensure that adequate public access is provided to recreational resources.

   d. "Pedestrian Shift" Alternative: This alternative appears to retain public access to the beach park and the coastal zone, which meets the criteria of HRS 205A and Chapter 25, ROH. However, being so close to the shoreline may have impacts. The Draft EA should carefully explore the balance among these Coastal Zone Management goals and objectives. This alternative appears to be the safest option for pedestrians who would not have to cross the street to access the beach. However, more information is needed to determine if a SMA or Shoreline Permit will be required.

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

Very truly yours,

FOR: Dean Uchida
Director

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

RICK BLANGIARDI
MAYOR

J. ROGER MORTON
DIRECTOR DESIGNATE

JON Y. NOUCHI
DEPUTY DIRECTOR

TP2/20-840976

March 5, 2021

Mr. Ken K. Tatsuguchi, Engineering Program Manager
State of Hawaii
Department of Transportation
Highways Division, Planning Branch
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Tatsuguchi:

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA)
Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

Thank you for the opportunity to provide written comments regarding the subject project. The Department of Transportation Services (DTS) strongly supports the intent of this project to improve pedestrian safety. We request to be consulted as this project progresses. Additionally, DTS is willing to provide technical assistance to review and develop conceptual design alternatives that promote Complete Street principles. We also provide the following comments.

1. **Complete Streets.**

   i. We recommend that the project conduct a Safe Speed Study to identify an appropriate speed limit for the project by analyzing conflict density and activity level, among other contextual factors, to determine the speed limit that will best minimize the risk of a person being killed or seriously injured. The National Association of City Transportation Officials (NACTO) Safe Speed Study methodology is recommended.

ii. We recommend that all alternatives provide travel lanes of no more than 11 feet to reduce speeding.

iii. The project area includes two City and County of Honolulu bus stops. We recommend that all alternatives attempt to retain these bus stops to reduce the demand for parking and to reduce traffic congestion. Alternatives should also provide a safe pedestrian crossing for those using these bus stops. The Honolulu Complete Streets Design Manual provides guidance on providing safe pedestrian crossings.

iv. Any bus stop affected by this project must be brought in compliance with Americans with Disabilities Act Accessibility Guidelines (ADAAG). The ADAAG requires a level landing area at bus stops that is clear of obstructions and measures eight feet (perpendicular to the curb) by five feet (parallel to the curb, connected to a pedestrian path or accessible walkway, and a firm stable surface).

v. "Pedestrian Shift" alternative. Of the four alternatives presented, this alternative appears to provide the highest level of safety for people on foot and on bike by providing adequate physical separation from vehicular traffic. However, it appears this alternative is designed to enable high-speed vehicle traffic through the project area. If the existing bus stops were to remain, passengers using the mauka side bus stop would need to cross this high-speed roadway to access Laniakea Beach or the shared-use path. We recommend all the general recommendations mentioned above, as well as, converting the 10' median into a center-turn lane to facilitate parking and reduce vehicle queues from blocking through traffic.

vi. We request that traffic data such as raw multi-modal counts and accompanying analyses be shared with the Regional Planning Branch (RPB) at dtsplanningdiv@honolulu.gov.

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

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

Thank you for the opportunity to review this matter. Should you have any questions, please contact Mike Motoki, of my staff, at 768-6684.

Very truly yours,

J. Roger Morton
Director Designate

HONOLULU EMERGENCY SERVICES DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H-450 • HONOLULU, HAWAII 96819-1814
Phone: (808) 723-7800 • Fax: (808) 723-7836

RICK BLANGIARDI
MAYOR

IAN T.T. SANTEE, MPA
ACTING DIRECTOR

February 19, 2021

SENT VIA EMAIL

To: Brian Tyau, Engineer
State of Hawaii, Department of Transportation
Brian.Tyau@hawaii.gov

From: Ian T.T. Santee, Acting Director
Honolulu Emergency Services Department

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach

Dear Mr. Tyau:

The Honolulu Emergency Services Department (HESD) supports the "Pedestrian Shift" Alternative. We believe this is the best and most practicable plan for an on-going public safety issue.

The HESD's Ocean Safety Division maintains one lifeguard tower at Laniakea Beach, and supports the immediate and surrounding area with mobile response teams (using trucks, jet skis, and all terrain vehicles). Annual statistics show a consistent threat to public safety because of surfing, swimming, paddling, and fishing accidents, *and* an increase in vehicle/pedestrian accidents. The nearest ambulance is at the Waialua Fire Station, so lifeguards are frequently the first of first responders on scene at any incident near the site of the proposed project.

HESD is in strong support of plan to re-route the highway thereby creating a safer corridor for access to the ocean. This proposed "Pedestrian Shift" Alternative will also vastly improve our response times in the area and, quite possibly, save lives.

Thank you for the opportunity to comment. Please contact me at 723-7811 if you have questions.

cc: James Ireland, EMS Chief
John K. Titchen, Ocean Safety Chief

HONOLULU EMERGENCY SERVICES DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H-450 • HONOLULU, HAWAII 96819-1814
Phone: (808) 723-7800 • Fax: (808) 723-7836

RICK BLANGIARDI
MAYOR

IAN T.T. SANTEE, MPA
ACTING DIRECTOR

February 10, 2021

MEMORANDUM

TO: Brian Tyau, Engineer
Department of Transportation

FROM: John K. Titchen, Chief of Ocean Safety Division
Honolulu Emergency Services Department

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach

The Honolulu Emergency Services Department, Ocean Safety and Lifeguard Services Division, supports the "Pedestrian Shift" Alternative. We believe this is the best and most practicable plan for an on-going public safety issue.

The City & County of Honolulu's Ocean Safety Division maintains one lifeguard tower at Laniakea Beach, and supports the immediate and surrounding area with mobile response teams (using trucks, jet skis, and all terrain vehicles). Annual statistics show a consistent threat to public safety because of surfing, swimming, paddling, and fishing accidents, *and* an increase in vehicle/pedestrian accidents. The nearest ambulance is at the Waialua Fire Station, so Lifeguards are frequently the first of first responders on scene at any incident near the site of the proposed project.

Ocean Safety is in strong support of plan to re-route the highway thereby creating a safer corridor for access to the ocean. This proposed "Pedestrian Shift" Alternative will also logically vastly improve our response times in the area and, quite possibly, save lives.

Mahalo for the opportunity to comment. Please contact me at 723-7863 if you have any questions.

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

RICK BLANGIARDI
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

February 17, 2021

Mr. Ken Tatsuguchi
Engineering Program Manager
Highways Division, Planning Branch
Department of Transporation
State of Hawaii
869 Punchbowl Street Room 301
Honolulu, Hawaii 96813-5097

Dear Mr. Tatsuguchi:

Subject: Pre-Draft Environmental Assessment Scoping and Request for Comments
Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Haleiwa, Island of Oahu, Hawaii

In response to your letter dated January 26, 2021, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires that the following be complied with:

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

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

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

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

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

Should you have questions, please contact Battalion Chief Reid Yoshida of our Fire Prevention Bureau at 723-7151 or ryoshida@honolulu.gov.

Sincerely,

JASON SAMALA
Assistant Chief

JS/EO:bh

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

RICK BLANGIARDI
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
AARON TAKASAKI-YOUNG
DEPUTY CHIEFS

OUR REFERENCE **EO-DK**

February 19, 2021

SENT VIA EMAIL

Mr. Brian Tyau
Brian.Tyau@hawaii.gov

Dear Mr. Tyau:

This is in response to your agency's letter of January 26, 2021, requesting input on the proposed Kamehameha Highway Pedestrian Safety Project in Haleiwa by the State of Hawaii Department of Transportation, Highways Division.

Whichever one of the four potential alternatives is decided upon, it would greatly impact traffic in and around the Laniakea Beach area. That stretch of road (Pohaku Loa Way) is heavily traversed by both vehicles and pedestrians due to its popularity with visitors and residents alike. The Honolulu Police Department recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the construction phase of the project.

If there are any questions, please call Acting Major Gordon Lum Kee of District 2 (Wahiawa) at 723-8700.

Sincerely,

Darren Chun
Assistant Chief of Police
Support Services Bureau

The Senate

STATE CAPITOL
HONOLULU, HAWAII 96813

February 25, 2021

Submitted via Email
Brian.Tyau@hawaii.gov

Brian Tyau
Hawaii Department of Transportation
869 Punchbowl St, Room 301
Honolulu, HI 96813

Subject: HWY-PA 2.5136
Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments
Haleiwa, Island of Oahu, Hawaii

Aloha, Brian.

Thank you for the opportunity to share these comments.

No Build Alternative: The status quo is painful, but it allows parking and beach access to a highly valuable coastline, treasured by surfers offshore, visitors observing sea turtles on the Waimea side, and families enjoying the sandy beach on the Haleiwa side.

No Build Settlement Alternative: This option should be carried forward as soon as possible because it can be implemented in conjunction with the Pedestrian Shift Alternative, or stand-alone without impairing future realignment alternatives. This alternative will allow parking, controlled turning movements, and aggregated pedestrian crossing, and it will not require significant investment.

A variation that might be considered is 4-6' high fencing between the highway and parking, and a pedestrian overpass. This could prove effective and more affordable than the Pedestrian Shift Alternative.

Transportation System Management Alternative: This is the worst option. Installing barriers to prevent parking when adjacent city owned land is available for this purpose, is unacceptable. The No Build Settlement Alternative would actually serve the public, compared to this plan which would harm public access.

Pedestrian Shift Alternative: There should be no reason to build a guardrail along the existing highway during construction with this option. A fence or guard rail could be installed mauka of existing parking to separate construction activity from existing use, or even the No Build Settlement Alternative. Surely the DOT has the capability to design an appropriate plan that allows partial or full parking during construction.

It appears the entire parking area highlighted in red will be open to vehicular turning movement from the highway and a middle refuge lane. Safe access to ample makai parking of the realigned highway is essential. The bike path and removal of the makai lane of the existing roadway are good ideas. The vegetated area in yellow and the designated beach paths are welcome.

This plan resolves several long-term issues and prior funding allotments: shoreline erosion and highway preservation, pedestrian crossing, traffic congestion, and obsolete bridge replacement. <u>With the continuation of parking during construction, this is the best of the four options.</u>

Other: The entire city park land is an asset that should be considered now. It could be used as temporary parking, if needed, to facilitate the Pedestrian Shift Alternative. It could be fully incorporated in the No Build Settlement Alternative to provide additional parking. Future ingress and egress to this land must be protected by any action.

As important as it is to resolve the Laniakea problems, careful consideration should also be given to the traffic impacts and pedestrian crossings at Chun's Reef. If realignment behind both these beach areas is unrealistic for the foreseeable future, then please move forward with a viable solution at Laniakea, post haste.

Our community has been crying out for relief for more than 15 years. We deserve better traffic flow, pedestrian safety and continuing access to this important shoreline. Thank you for heeding this call.

Respectfully submitted,

Gil Riviere
Senator, District 23
Oahu's North and Windward Shores

Charter
COMMUNICATIONS

DATE: 02-04-21

Attn: Brian Tyau

Project: Kamehameha Highway Pedestrian Safety Project
Subject: HWY-PA 2.5136 (Laniakea Beach)

Dear Brian,

The locations of existing routes and crossings were shown on the provided plans. The exact locations, and routing of all CATV facilities must be verified in the field due to construction variances. The location of the proposed project should not have an effect on Spectrum's existing CATV plant in your work area.

However, if the work or repairs being performed requires special machinery, with a specific height requirements, the contractor performing the work, will be required to notify our office prior to performing any work. Spectrum may need to reattach or move or plant system, in the event that we have to relocate our existing plant system, charges may apply.

At this time, Spectrum utilizes both HECO and HTEL existing poles in your proposed project location. In each of the four proposals Spectrum utilities will not be impacted and currently we no future planned activities or projects to that area. In regards the proposed projects the "Pedestrian Shift" Alternative appears to be the safest for the general public as well as our Spectrum personel. Having a parking area in that section closer to utilities would allow us to maintain our facilities more safely and without impacting traffic, which would help to elevate some of the congestion along that stretch of roadway.

This information has been provided to help minimize delays and prevent damage to existing CATV structures within the project area. Should you have any questions or concerns, please feel free to contact me at 808-348-8359, 808-695-3165, or email me at Chinnough.Colburn@charter.com

Sincerely,

Chinnough Colburn

Construction Coordinator

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Thursday, March 11, 2021 2:38 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Cc: Kuwaye, Kristen <kristen.kuwaye@hawaiianelectric.com>
Subject: [EXTERNAL] Pre-Draft EA Scoping and request for comments - Kamehameha Highway Pedestrian Safety Project HWY-PA2.5136

Dear Mr. Tyau

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should Hawaiian Electric have existing easements and facilities on the subject project limits, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Kamehameha Highway Pedestrian Safety project comes to fruition, please continue to keep us informed.

Should there be any questions, welcome to contact me at 543-7245

Rouen Liu
Permit Engineer
Hawaiian Electric Company

KAMEHAMEHA SCHOOLS®

February 25, 2021

VIA EMAIL ONLY (brian.tyau@hawaii.gov)

Brian Tyau
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawai'i 96813

Re: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Pre-Draft Environmental Assessment ("EA") Scoping and Request for Comments
Haleiwa, Island of O'ahu, Hawai'i

Dear Mr. Tyau,

Thank you for your letter dated February 3, 2021 and the opportunity to comment on the project proposed by the State of Hawai'i Department of Transportation, Highways Division ("HDOT") to address pedestrian safety in the area of Laniakea Beach ("Project"). Kamehameha Schools ("KS") concurs with HDOT's intent to re-prioritize pedestrian safety, while reaching a resolution that accommodates all of the concerns in the area. With the above in mind, please find below a list of questions and concerns that KS would appreciate if you could address in connection with the HDOT proposed project.

1. **Cultural Sites**. The proposed "Pedestrian Shift" alternative has the potential to impact a cluster of traditional Hawaiian archaeological sites located at the northeastern end of this proposed alternative (see attached map). Of note are the presence of ceremonial and burial sites. KS recommends that these sites be avoided and that appropriate site buffers be created to mitigate any impacts. KS also recommends that Waialua-area cultural descendants and the Waialua Hawaiian Civic Club be consulted to determine the significance of known Hawaiian cultural sites or to learn about any additional sites that could be impacted by the proposed project. For example, there is a high probability that traditional Hawaiian burials may be within the proposed project's footprint due to its proximity to the sandy coastline.

2. **KS Lands**. Based upon the information provided to date, it is unclear whether and to what extent KS lands in the area may be impacted. Please provide detailed information on impacts to KS lands, including, without limitation, whether HDOT will be seeking to acquire any KS lands and/or remove fencing along KS boundaries.

3. **Agricultural Tenant Operations**. KS has several agricultural tenants in the area, including Kawailoa Ranch. Please provide detailed information on how the proposed

Project would impact those tenants, including their use of surrounding trails, ranch operations, and revenue.

Thank you for consideration. We look forward to your response.

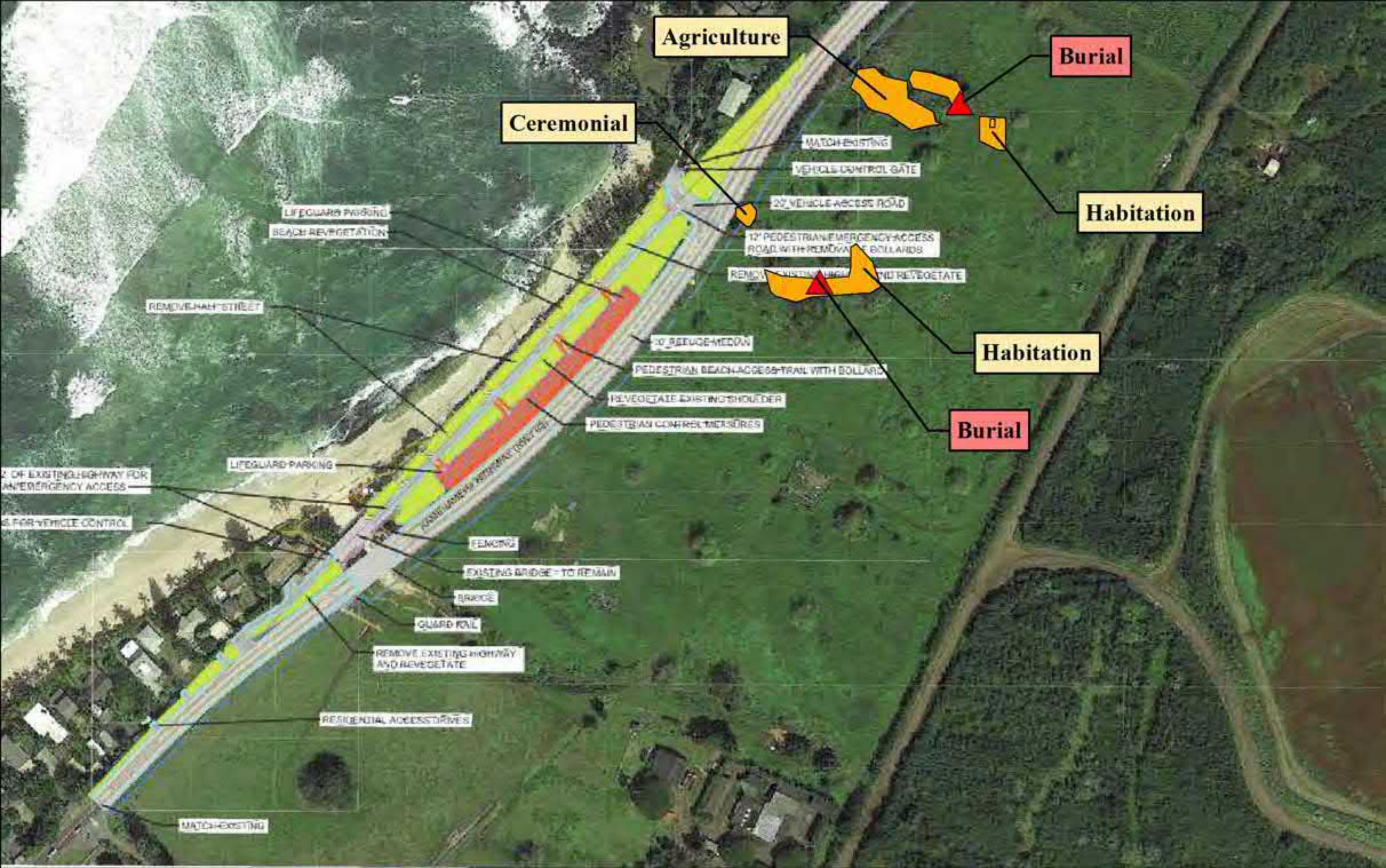
Very truly yours,

KAMEHAMEHA SCHOOLS

Keith K.A. Chang

Keith K.A. Chang
Land Asset Manager
North Shore - Haleiwa | Maui | Molokai
Community and ʻĀina Resiliency

Attachment



Agriculture
Burial
Ceremonial
Habitation
MATCH EXISTING
VEHICLE CONTROL GATE
20' VEHICLE ACCESS ROAD
12' PEDESTRIAN/EMERGENCY ACCESS
ROAD WITH REMOVABLE BOLLARDS
LIFEGUARD PARKING
BEACH REVEGETATION
REMOVE HALF STREET
Habitation
10' REFUGE MEDIAN
PEDESTRIAN BEACH ACCESS TRAIL WITH BOLLARDS
REVEGETATE EXISTING SHOULDER
PEDESTRIAN CONTROL MEASURES
Burial
LIFEGUARD PARKING
OF EXISTING HIGHWAY FOR
EMERGENCY ACCESS
FOR VEHICLE CONTROL
FENCING
EXISTING BRIDGE - TO REMAIN
BRIDGE
GUARD RAIL
REMOVE EXISTING HIGHWAY
AND REVEGETATE
RESIDENTIAL ACCESS DRIVES
MATCH EXISTING

From: Beau Sheil <beau@tropicblue.net>
Sent: Wednesday, April 7, 2021 3:53 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Cc: Joanne Martin <jmartin@stanford.edu>
Subject: [EXTERNAL] Kamehameha Highway Laniakea Beach Project HWY-PA 2.5136

First, thank you for sending us detailed descriptions of four proposed alternatives for fixing the problems with pedestrian access and traffic management at Kamehameha Hwy near Laniakea Beach and soliciting my input.

Of the four alternatives you present, we are strongly in favor of the "Pedestrian Shift" alternative, namely relocating Kamehameha Hwy inland and creating parking between the highway and the shoreline for users of and visitors to the beach. This not only solves the pedestrian and traffic problems, but also defers the day when the highway will have to be moved due to shoreline erosion.

Of the other alternatives, the "No build settlement alternative" is a marginal improvement over the current situation, in that it manages the pedestrian traffic better than the current chaos, but is incomplete in that without traffic lights or other directives to traffic and pedestrians, it would still allow chaotic pedestrian cross traffic.

The other two alternatives are totally unacceptable.

Leaving things as they are, the "No build" alternative, leaves North Shore traffic in a state of intermittent gridlock, to the despair of both residents and visitors.

The "Transportation System management" alternative basically walls off both local beach users and tourist access to a favorite local beach.
What's worse, as the experiment with semi-temporary guardrails showed, it just pushes the parking up and down Kamehameha Hwy for up to half a mile in each direction. It does little to reduce the flow of pedestrians crossing the highway or the traffic chaos that they cause - it just spreads it out.

I'm surprised that the Department of Transportation can even consider either of these alternatives.

Let me also be clear that my preferences are just preferences *among these four alternatives* that you have presented. I'm not convinced that there are not better alternatives, e.g. relocating the highway mauka of both Laniakea *and* Chuns Reef, where mauka parking for the beach creates almost as much traffic chaos as Laniakea.

But among these choices, "Pedestrian Shift" is our clear preference.

Thanks for asking.

- Beau Sheil
Haleiwa

From: nimboy44@aol.com <nimboy44@aol.com>
Sent: Sunday, March 21, 2021 8:30 PM
To: brian.tyau@hawaii.gov
Cc: roxana@gonorthshore.org; ken.tatsuguchi@hawaii.gov; Adams, Rachel <Rachel.Adams@wsp.com>
Subject: Laniakea North Shore Chamber of Commerce March Board meeting

Aloha, Brian,
the Board very much appreciated DOT's openness to input.
The Board is supportive of the Pedestrian Shift option with one very important adjustment.
The Board voted unanimously to have me advise you that a long period or periods of time with no parking at Laniakea just will not work.
One option raised was could, for example, one bridge be built at a time so that parking could still be made available in the areas of the highway where construction was not taking place.
The community need is to always have some parking available at Laniakea.
Hope your planners can take this into account and be more flexible about parking.
Thanks,
Bill.

Sent via email to: *Brian.Tyau@hawaii.gov*

Brian Tyau
Highways Division
Hawaii Dept. of Transportation
869 Punchbowl St.
Honolulu, HI 96816

Re: Proposed Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach, O'ahu

Dear Mr. Tyau,

HDOT Engineering Program Manager Ken K. Tatsuguchi sent a letter dated February 2, 2021, letter to *Save our Surf*, c/o John Kelly, of requesting comment on the D0T's proposed Laniakea project was forwarded to me. Would you kindly update your records to indicate that Mr. Kelly is deceased and that I am serving as Spokesperson for Save our Surf at this time.

The letter asked that comments be sent within 30 days and I am timely responding on behalf of Save Our Surf. I have reviewed the description of the various alternatives to the proposed project in that letter and have the following comments:

1. Proposal to Eliminate Existing Ocean Access Parking at Laniakea Support Park

It appears this is a multi-year project with no apparent fixed or predictable timeline. It also appears that one or more of the proposed alternatives call for the complete and closure and elimination of parking across from Laniakea on the City's Laniakea Support Park parcels, TMK #s 6-1-010-024, 6-1-010-019 and 6-1-009-021, for an indefinite period of time - likely years. We feel this is extremely ill advised and would be contrary to both the letter and spirit of Hawaii law, including specifically H.R.S. Chapter 205A.

Chapter 205A, known as the Coastal Zone Management Act ("CZMA"), was passed in the 1970's to recognize, protect and assure public access to Hawaii's unique shoreline and coastal recreational resources and opportunities. That law is binding upon all governmental agencies when proposing projects within the vicinity of those resources and requires that they comply with various objectives, policies, and guidelines set forth in the law. Paramount among those are requirements that agencies preserve, protect and enhance public access to and use of those resources.

The CZMA specifically protects surfing sites and other coastal recreational activities through a series of mandates which require "all agencies" to:

- Consider the importance of public coastal access and the availability of unique recreational and cultural activities in those area;

- Provide coastal recreational opportunities accessible to the public;

- Protect and preserve those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian history and culture;

- Protect coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

- Require replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged;

- Provide and manage adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

- Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.

In this situation, DOT should be aware that Laniakea is a very unique, world class surf site, as are several other nearby spots including Himalayas and Hultin's. They all depend on the parking across from Laniakea itself.

In addition, there are a number of other unique cultural resources in the Laniakea Beach area. I am sure you are aware of the prolific Green Sea Turtle feeding and viewing area at the East end of the beach. Fishing (including spear, net and hook-and-line) and snorkeling are also very popular here in the summer. Kayakers, swimmers, wind surfers, kite surfers, stand-up paddle-boarders, snorkelers, fishermen, picnickers, tourists, families, wheelchair-bound beachgoers and others have used this area on a regular and frequent basis for many decades.

The City park parking area is a location historically known for the ready ocean access it provides for ocean users - in particular surfers, fishermen and beachgoers. It is unique among oceanfront park properties along O`ahu's North Shore in that its coastal waters are very close to Kamehameha Highway and its parking is such that the waters are easily accessible to the public within a few short footsteps. The clear, level and open parking area that has been used in excess of fifty years by a variety of park and beach users, surfers, kayak paddlers, stand-up paddle (SUP) boarders, swimmers. This is primarily utilized as a much-needed parking area and recreational equipment unloading area for these users and is integral to their coastal access.

Accordingly, the DOT must make every reasonable effort to come up with a solution that does not hinder or diminish the public's ability to enjoy coastal recreational opportunities at Laniakea. There is very limited roadside parking elsewhere along Kamehameha Highway for miles in either direction and there are few side streets where such parking is permitted. Those limited parking areas which do exist lie closer to the highway than the Laniakea parking lot and are generally less safe and convenient to access, are further away from the shoreline access points and have a much more limited number of legal parking spaces. That parking is totally insufficient to handle the public's heavy use of Laniakea and its surrounding areas. In fact, it appears that the HDOT recently put up no parking signs to eliminate roadside shoulder parking East of Laniakea. Limitations on the availability of parking and areas for the unloading of ocean gear (canoes, surfboards, stand-up surfboards, kayaks, paddleboards, beach wheelchairs, etc.) are significant constraints on public ocean access on O'ahu, particularly on the North Shore.

Accordingly, we feel that HDOT cannot legally proceed with any project alternatives that totally eliminate the existing parking, either during construction or as part of the completed project. In order to comply with the CZMA, the space for approximately 55 to 60 cars must be maintained on the City park parcels or some other alternative arrangement must be made to assure continued uninterrupted access to the coastal resources in the area.

It is important to note that when HDOT installed unpermitted concrete barriers in December 2013 which blocked off parking on the City park parcels, it created a very hazardous situation where pedestrian beachgoers were forced to walk along the narrow highway shoulder for long distances pushing strollers, rolling wheelchairs, and carrying beach chairs, umbrellas coolers, surfboards, kayaks, and SUP and windsurfing boards and equipment. This simply increased the pedestrian danger and stretched that danger out over a longer distance.

In addition, people parked along the mauka shoulder continued to haphazardly cross the highway to reach the beach. With shoulder parking stretching on several hundred yards on either side of the beach, the crossing danger was also more spread out and unpredictable to motorists.

The project must not inadvertently create safety issues on either side of Laniakea by encouraging parking along the highway with its well documented hazards. Clearly, eliminating nearby parking for people trying to access the beach and creating a very dangerous situation in the name of a "pedestrian safety project" is completely counter-productive.

If HDOT cannot phase any of the alternatives in a way that preserves adequate public parking on the City park parcels, it needs to find an alternative temporary location for coastal access parking in the immediate vicinity. KSBE has a considerable amount of land mauka of the highway and one or more temporary parking lots could be set up on that existing, mostly flat and clear acreage. Acquisition of temporary construction easements for that purpose can be included in the ROW condemnation proceedings that HDOT must undertake for any bypass. The current parking takes up less than half-an-acre (0.35 acres on TMK# 6-1-010-019 and 0.07 acres on TMK# 6-1-009-021). A convenient parking lot that size or slightly larger could easily be located somewhere on KSBE's adjacent TMK# 6-1-005-023 on a temporary basis for minimal cost, considering the overall project budget.

And of course, in order to comply with the mandates of the CZMA, the finished project, whatever form it takes, must permanently restore, if not increase and enhance, all of the existing parking. Some of the alternatives vaguely discuss "informal parking" as part of the finished project. However, from the depiction of the "Pedestrian Shift Alternative" on page 9, it does not appear that sufficient consideration or space has been given to keeping parking at current levels.

"Informal parking" seems more like token parking.

In short, adequate parking must be uninterrupted throughout - preserved or enhanced. HDOT cannot ignore its legal responsibility to provide and manage "adequate public access . . . to and along shorelines with recreational value."

2. Elimination of Laniakea Beach Support Park

Another disturbing aspect of several of the proposed alternatives is complete closure of, or elimination of access to, Laniakea Beach Support Park. As noted above, the CZMA requires that agencies provide "an adequate supply of shoreline parks and other recreational facilities suitable for public recreation." Although the City has not yet funded significant improvements to that park, it was condemned in 2012 and justified because of the great need for public parks and coastal recreational opportunities on O'ahu's North Shore. It is incumbent upon HDOT to preserve, if not increase and enhance, public park availability at Laniakea. As with parking, this is true for both the construction phase and the final finished project. Again, there is adequate mostly vacant land available nearby that, through the condemnation process, could serve this purpose.

Conclusion

We are hopeful that HDOT will take seriously the obligations imposed upon it by the CZMA, H.R.S. Chapter 205A. In order to comply with the law it must make some sort of accommodation for maintaining safe, easy public coastal access. The obligation to mitigate the negative effects impacts of any and all proposed pedestrian safety alternatives is clear. No alternative can be studied or chosen unless it accomplishes that.

Thank you for the opportunity to comment on this matter.

Sincerely,

Keone Downing
Save Our Surf

From: nimboy44@aol.com <nimboy44@aol.com>
Sent: Wednesday, February 17, 2021 12:01 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: Re: [EXTERNAL] Laniakea North Shore Chamber of Commerce

Hi, Brian,

thanks for the prompt response.
I will get you feedback from the Chamber Board.

What follows is from me and not the Chamber:

I have been "involved" in looking for solution to the Laniakea traffic problem for a number of years.

The attached photo shows how the ocean can break onto the highway. Hope DOT has taken this into account in the planning.

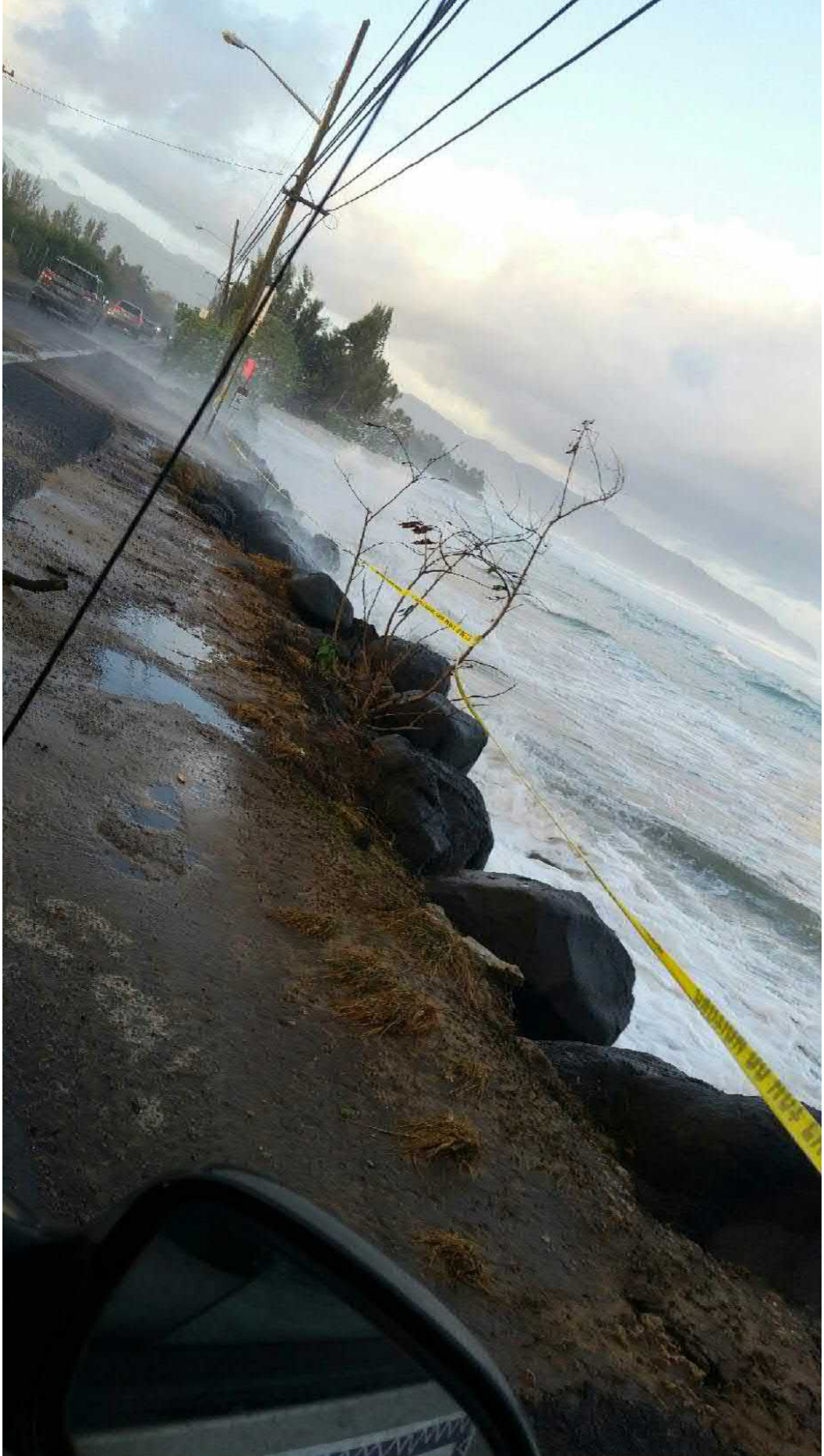
I helped develop the attached plan.

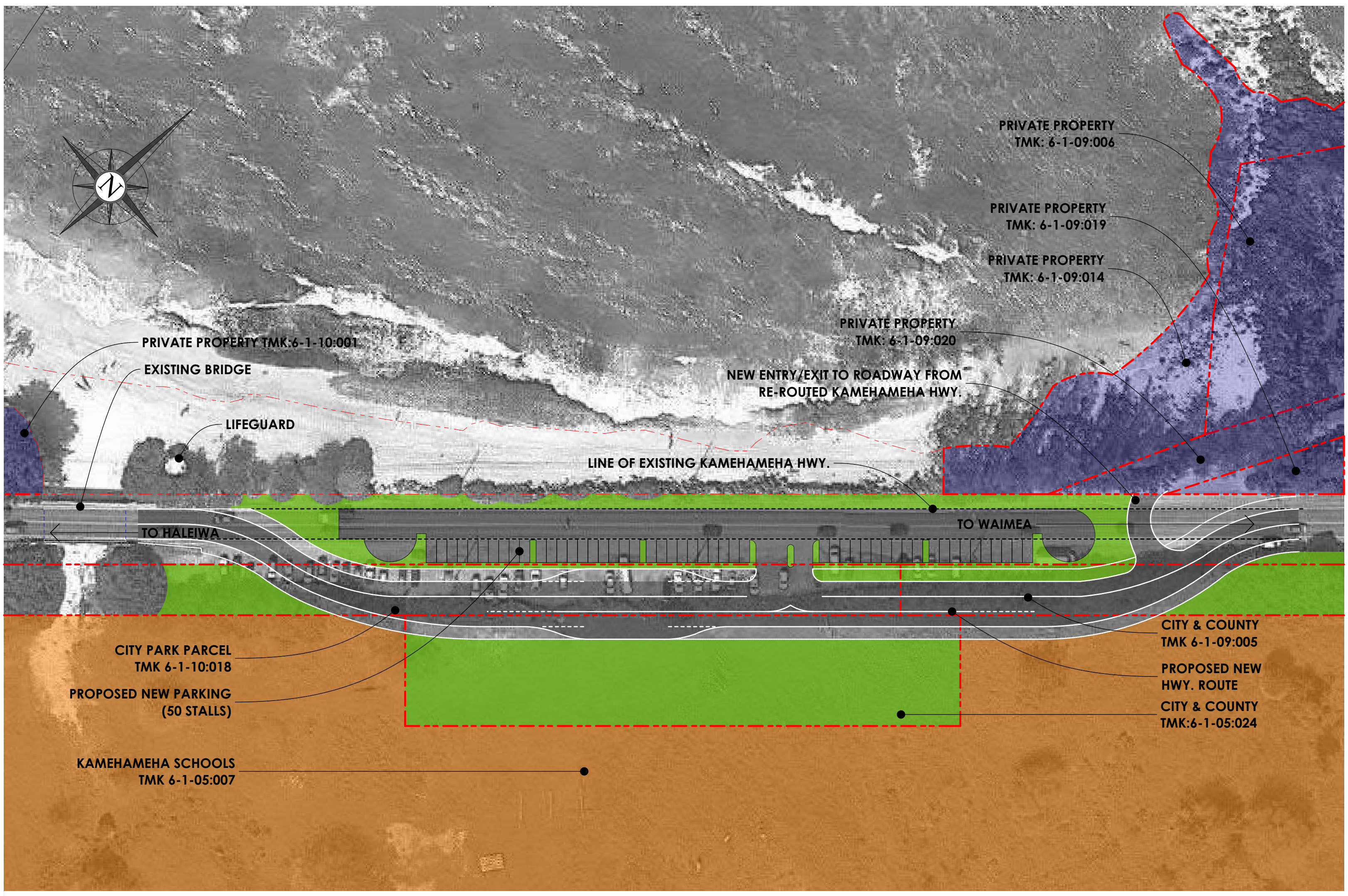
Our thought is that if parking could be on the makai side of the highway it should reduce the traffic problem significantly. Stacking lanes re included in both directions.

If the Governor could declare an emergency because of the potential damage to the highway from the ocean we thought an emergency rerouting could be built on the mauka side without the cost and complication of Federal Highway standards and processes.

It should be less expensive and fast and would solve the safety problem until the State has the $$$ that will be necessary for a long term solution further mauka.

Thanks again,
Bill Quinlan





Concept Plan Rendering

LANIAKEA ACCESS PLAN

Laniakea, Haleiwa, Oahu, Hawaii

January 28, 2014

SOUTH PACIFIC DESIGN GROUP

March 31, 2021

Aloha Brian Tyau

Brian.Tyau@hawaii.gov

Regarding Laniakea:

What we have in this area is a natural attraction/asset that most any community would be proud to have in its inventory.

What we need [should have] is a holistic collective long-term plan that addresses the potential positive aspects this area has to offer and the potential problems. This plan should be inclusive of all governing agencies [Federal, State, City and County] and no aspect of the plan should preclude another agency's ability to move forward with their part of the plan in the future. [ie the DOT built a road so now there can be no beach park].

This area has a cultural past that predates written history. It has petroglyphs at the shore line, burials [I am told] in the ma uka area, rock alignments that may or may not be of significant historical value, Kahoku welowelo heiau just down the road near Ashly Road Gate, endangered green sea turtles that come to the area due the red limu in the area [and that now bask in the sun since they are protected], fishing and nearshore resources, great world class waves, fresh ground water discharge through the cap rock, to mention a few.

For over the last 50 years surf movies have extoled the amazing right slide waves that can be had on perfect days at Laniakea. Outside the channel [rip] to the west is a large left slid called Himalayas. Due to these unique features, inherent hazards and the thousands of people who stop here the City has stationed lifeguards at this beach.

When Frank Fasi was the Mayor of Honolulu, the Department of Parks and Recreation did planning for the future and Don Griffin was authorized to acquire a considerable amount of land for future parks [approximately 40 or so years ago].

The demand/popularity of the locations that were purchased are under more pressure that ever from those seeking recreational opportunities.

What should be at Laniakea, as envisioned over forty years ago, is a real beach park [like so many others around the island with fewer assets and much less utilization]: adequate parking, showers, a restroom facility, multi-modal access, a lifeguard facility [which could use some storage area], and appropriate staffing.

I fervently hope that the plans currently being considered by the DOT will be compatible with a future Beach Park anticipated for this area and will not create some inherent conflict. Nothing stays the same and the ocean level rising needs to be factored into all ocean front projects looking forward.

Another impact related to this area worthy of mention/consideration are tourists in rental cars who have planned to visit the famous North Shore and now many of them have their first opportunity to pull off the road and have a look at the surf/surfers, look at and/or snorkel with some turtles, take some ocean/beach souvenir selfies, or perhaps to look for a green flash during one of Hawaii's amazing sunsets. Lots of people fit this profile, and Laniakea fits the marketed image of Hawaii. Visits to this area should not be discouraged.

Safe and plentiful parking is critical in the planning phase [and operational phase] for all users and service personnel. If the designed parking is full then a safe, wide enough shoulder on Kamehameha Hwy should be provided. As it is now the overflow [up the road] parking is not safe, as the rear end of cars that cannot pull forward enough often exceeding the white strip defining the right side of the East bound lane.

I feel that of the options that you have provided for consideration that the Pedestrian Safety realignment is the one that most approximates a user-friendly park. Further considerations related to this option is that the bike rider in the illustration be on a delineated bike path [there is plenty of room]. Bike path rules need to be clearly understood. The bike path rules at Sunset Beach are still on a learning curve. Long term it has been the wish of many in the community for over forty years to have a bike path/lane that connects Haleiwa with Sunset Beach and beyond to BYU. In the other direction there is a desire to connect to Kaena Point. Each dedicated piece helps to achieve this goal.

The plan should include significant room for motorized moped/motorcycle parking and a bike rack.

Safety and erosion control both need to be factored into the actual access to the beach area. If improved clearly marked accesses are not delineated, then creative forces will create them in multiple areas. I have seen some serious accidents with mobility challenged individuals taking some nasty falls trying to get down to the water because no improvements have been made … thus far.

It would be of value to make appropriate accommodations for the lifeguards to have an area where they can launch their water safety equipment. In an emergency time may matter a lot.

Landscaping always makes a real difference. Please have that as a line item in the budget.

Signage is a valuable training aid. It would be nice to have some coordinated educational signage that addresses safety issues and honors some cultural and natural history. Lots to tell about this place [look at the EIS-2b :)]

Finally, is the timing/scheduling of the actual work to create the improvements. There needs to be a plan that will not slow traffic down especially during commuter times. Also parking/access to the beach amenities must not be impinged to such a state that the public cannot find places to park. So, sequencing/phasing and timing are critical to the success of this project from the perspective of the users. Key: Minimize inconvenience to recreational users and commuters.

Thank you for the opportunity to share some thoughts about Laniakea improvements along with the many other suggestions that you have received over the years. I know that "the DOT builds roads"   …. But /and in this case we would all benefit greatly if you could stretch your mission statement and facilitate some appropriate embellishments.

Sincerely,

Bob Leinau   Civic advocate and recreational user for over 50

808-638-7010

From: Dee Thomas <dee@surfingohana.com>
Sent: Thursday, March 4, 2021 1:53 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Cc: Brett Thomas <brett@surfingohana.com>
Subject: [EXTERNAL] Kamehameha Hwy: Laniakea Beach

Aloha & mahalo for the detailed proposals sent to us residents. We are quite impressed with the proposal packet and request for our input.
We are in support of the "Pedestrian Shift" alternative as it would allow for better vehicle flow & pedestrian safety. Only concern is that this proposal may be subjected to extreme delay due to local politics. In the mean time, we support "No Build Settlement " which includes pedestrian cross walks, though the crosswalks will be ineffective unless strictly enforced by police or by implementing pedestrian cross light signals.
Thank you,
Dianne & Brett Thomas

Sent from my iPad

From: Brian Emmons <brimohi@msn.com>
Sent: Sunday, March 21, 2021 7:45:08 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Kam Hwy Pedestrian Safety Project

To whom it may concern-

All that money to consultants, meetings, studies, more money, more meetings, more studies... and nothing done all these years. I was part of the Kam Hwy Realignment Committee years ago... we all saw how that worked out. Of the four alternatives, only the "Pedestrian Shift," makes any sense for us, the community. It's a shame that the DOT had to "re-priortize" and change their objective away from the obviously needed "protection of the highway from wave-driven erosion and keep it operational," when taking care of this priority would have eliminated the pedestrian safety problem as well! If only SOMETHING had been done about it before someone was injured....
Lets hope the DOT, and whoever else has their fingers in the pie, finally gets this done.
Aloha, Brian Emmons

From: David Fisher <wayoverhead@gmail.com>
Sent: Thursday, March 25, 2021 5:39:46 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea

Aloha, Brian
I firmly believe the only option is The "pedestrian shift" alternative

Mahalos
David Fisher
61–431 Kamehameha highway Haleiwa

-----Original Message-----
From: Deborah Aldrich <surfchick96712@yahoo.com>
Sent: Thursday, March 25, 2021 7:20 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea

Hi Mr. Tyau,

First of all thanks for doing anything!! It's been so long that we who live out here have been prisoners who didn't go out when we often wanted because we couldn't just turn around and go home.

I support the "Pedestrian Shift" alternative. Just keep them out of the way as they expect everyone to just stop. Too many moving pieces with them crossing willy nilly.
That would also include the barrier going up to delineate the construction zone. The barriers worked. It was unfortunate a vociferous few objected.

For the demographics, if you care, I'm a 71 year old retired RN (woman) who moved here in '77 to surf. I own a home up by Alligator Rock.

Thanks,

Debbie Aldrich
Surfchick96712@yahoo.com

Sent from my iPad

Feb 13, 2021

Kamehameha Hwy Pedestrian Safety Project

Pre-Draft Environmental Assessment (EA)

Scoping and Request for Comments:

Laniakea Beach Vicinity

DOT – HWY – PA – 2.5136

Reference to Letter dated : January 26, 2021

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing to realign Kamehameha Hwy in the vicinity of Laniakea Beach.

I am very much in favor of realigning Kamehameha Hwy.

Alternative # 1 and Alternative # 2 as presented are unacceptable. There is an urgent need to REALIGN the HIGHWAY. To ensure a normal traffic flow, to protect the highway from erosion, and to address pedestrian safety.

#1.**No Build Alternative – This is not acceptable**. It does nothing to resume a free flow of traffic on a major highway, does nothing to stop the gridlock traffic situation or protect pedestrian safety.

#2. **No Build Settlement Alternative – This is not an acceptable alternative**. Because it still allows parking on the mauka side of the highway and allows pedestrians to stop traffic while crossing the highway in both directions. It is extremely doubtful that people would actually use any designated crosswalks especially since there will be no enforcement. It is a waste of our tax dollars.

#3: **Transportation System Management Alternative –** This alternative should be implemented temporarily while Kamehameha Hwy is being realigned. This would at least provide traffic congestion relief and address pedestrian safety by discouraging pedestrians from parking on the mauka side to cross the highway.

#4: **"Pedestrian Shift" Alternative** – This alternative is the only one that addresses pedestrian safety, the flow of traffic (which is the communities MAIN priority) and address the safety of the highway itself due to beach erosion.

A year or 2 ago there was a far better alternative proposed by Ed Sniffen which involved moving the highway much much further mauka. What happened to that plan? I would like to see that alternative be considered in an EA.

I am extremely disappointed that the HDOT decided to name and re-prioritized "Pedestrian Safety " as the main reason to spend our tax dollars for this long needed project. I want to know the reason why. I can only imagine that it is due to accessing and obtaining specific funding for a specific reason that addresses "pedestrian safety".

When the **major reason** to spend tax dollars to realign the highway should be to restore a safe and normal life for residents and visitors who are currently trapped in grid lock traffic caused by pedestrians crossing the highway at Laniakea. We desperately need to work towards a normal flow of traffic on our one and only major highway.

The North Shore community residents and the millions of visitors driving through the North Shore have suffered greatly. This gridlock traffic situation could also be construed as a "major safety concern" since thousands of residents and visitors and emergency vehicles are also stuck in the horrendous traffic.

As a long time community member I've been involved in trying to help solve this problem for 10 -20 years now. While it is true that our community has been worried about pedestrians getting hurt by running across the highway and we accept that this is of concern, to say that this is the main need for this project is just false. Renaming the project and scope should be considered.

Addressing the true community needs and respecting the thousands of volunteer hours by community members attending multiple task force meetings over many years, using our tax payer's dollars to keep funding more and more planners, paying for never implemented plans...is shameful. Let's fix the situation properly.

Sincerely,

Diane Anderson Diane Anderson

Douglas Meller
douglasmeller@gmail.com

February 25, 2021 Comments on Proposed Kamehameha Highway Pedestrian Safety Project Submitted to HDOT Project Manager, Mr. Brian Tyau via email at: *Brian.Tyau@hawaii.gov*

HDOT's January 27, 2021 STIP does not propose highway realignment at Laniakea Beach during federal FY 2021-2024. Because HDOT has funding limitations and other priorities, highway realignment could be postponed for many years.

Before the highway is realigned, I support any project solely intended to make it safer for the public to park near and/or walk to Laniakea Beach. However, I strongly oppose any project which would close all public parking at Laniakea Beach for an indefinite multi-year period. Without public parking, most Oahu residents could never visit Laniakea Beach. An HDOT project which prevents most Oahu residents from visiting Laniakea Beach for an indefinite multi-year period would unnecessarily curtail beneficial uses of the environment, conflict with the State's environmental policies, and limit surfing and other community cultural practices.

§11-200.1-10, Hawaii Administrative Rules, requires that HDOT comply with §343-5, Hawaii Revised Statutes, before using state funds to design or construct any HDOT project. (Similarly, NEPA compliance is a prerequisite for FHWA obligation of federal highway funds for design or construction of any federal-aid project.) §343-5(c)(4), Hawaii Revised Statutes, requires preparation of an environmental impact statement (EIS) before the HDOT uses state lands or funds for an action which has a "significant effect". Any HDOT project which prevents most Oahu residents from visiting Laniakea Beach for an indefinite multi-year period would have a "significant effect" as defined under §11-200.1-2, Hawaii Administrative Rules. Under §11-200.1-13(b)(2), Hawaii Administrative Rules, an action which "curtails the beneficial use of the environment" would have a "significant effect". And under §11-200.1-13(b)(3), Hawaii Administrative Rules, an action which conflicts with statutory environmental policies under §205A-2(c)1)(B)(iii & v), Hawaii Revised Statutes, would have a "significant effect".

> ***§343-5 Applicability and requirements.*** *(a) Except as otherwise provided, an environmental assessment shall be required for actions that:*
>
> > *(1) Propose the use of state or county lands or the use of state or county funds, other than funds to be used for feasibility or planning studies for possible future programs or projects that the agency has not approved, adopted, or funded….*
>
> *(b) Whenever an agency proposes an action in subsection (a), … the agency shall prepare an environmental assessment … at the earliest practicable time to determine whether an environmental impact statement shall be required….*
>
> *(c) … (4) A statement shall be required if … the proposed action may have a significant effect….*

Hawaii Administrative Rules Title 11, Department of Health, Chapter 200.1, Environmental Impact Statement Rules (effective August 9, 2019)

§11-200.1-2 Definitions.

"Effects" or "impacts" as used in this chapter are synonymous. Effects may include … cultural effects, economic effects, social effects, or health effects whether primary, secondary, or cumulative, whether immediate or delayed. Effects may also include those effects resulting from actions that have both beneficial and detrimental effects….

"Significant effect" or "significant impact" means the sum of effects on the quality of the environment, including actions that … curtail the beneficial uses of the environment, are contrary to the State's environmental policies … as established by law, adversely effect the … cultural practices of the community and State, or are otherwise set forth in secion 11-200.1-13[O1]

§11-200.1-10 Multiple or phased actions. *A group of actions shall be treated as a single action when:*

(1) The component actions are phases or increments of a larger total program;
(2) An individual action is a precedent to a larger action;
(3) An individual action represents a commitment to a larger action; or
(4) The actions in question are essentially identical and a single EA or EIS will adequately address the impacts of each individual action and those of the group of actions as a whole.

§11-200.1-13 Significance Criteria. *…*

(b) … In most instances, an action shall be determined to have a significant effect on the enviroment if it may: …

(2) Curtail the beneficial uses of the environment;
(3) Conflict with the State's environmental policies … established by law;
(4) Have a substantial adverse effect on the … cultural practices of the community or State….

If HDOT rejects reasonable alternatives, and closes all public parking at Laniakea Beach for an indefinite multi-year period, HDOT will not comply with the following statutory Coastal Zone Management (CZM) policies.

CHAPTER 205A
COASTAL ZONE MANAGEMENT

§205A-2 Coastal zone management … policies. *…*

§205A-2(c)(1)(B)(iii) Providing and managing adequate public access … to … shorelines with recreational value …

§205A-2(c)1)(B)(v) Ensuring public recreational uses of … shoreline lands and waters having recreational value ...

§205A-2(c)(7)(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development …

§205A-2(c)(8)(c) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts …

§205A-2(c)(9)(C) Minimize the construction of public … structures … at sites having sandy beaches and at sites where … structures interfere with existing recreational and waterline activities ….

No one wants another lawsuit. It would be silly to either threaten or provoke one. But if HDOT rejects reasonable alternatives, and closes all public parking at Laniakea Beach for an indefinite multi-year period, someone will file a lawsuit under §205A-6(a), Hawaii Revised Statutes, which alleges that HDOT is not complying with §205A-4(b) and §205A-5(b), Hawaii Revised Statutes.

§205A-4*(b) The … policies of this chapter … shall be binding upon actions within the coastal zone management area by all agencies….*

§205A-5*(b) All agencies shall enforce the … policies of this chapter….*

§205A-6*(a) Subject to chapters 661 and 662, any person … may commence a civil action alleging that any agency … Is not in compliance with one or more of the … policies … provided … by this chapter….*

(c) A court … shall have jurisdiction to provide any relief as may be appropriate, including a temporary restraining order or preliminary injunction….

Dated: Honolulu, Hawaii, February 25, 2021

DOUGLAS MELLER

From: Gordon Merchant <gordon@outtheback.com>
Sent: Tuesday, March 02, 2021 10:51 AM
To: Ho, Tracy <tracy.ho@hawaii.gov>
Subject: [EXTERNAL] Re: Kamehameha Highway Pedestrian Safety Project

Aloha
My preference is for the last option in sketch 8 and 9.

Gordon Merchant.

From: Hans Hedemann <hhsurfschool@gmail.com>
Sent: Thursday, March 11, 2021 10:50 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Cc: k hedemann <klhedemann@gmail.com>
Subject: [EXTERNAL] Laniekea Safty Traffic Proposal

Hi Brian,

The best and ultimate solution in my recommendation to organize traffic and safety issues for the long future ahead of Northshore visitor's / residents and ongoing upgrades of Turtle Bay Resort go to destinations would be to implement the Pedestrian Shift.

Best, a long term effective plan to redirect traffic for beach / surfing enjoyment and safety access / parking, so traffic does not back up for hours.

Laniekea is the first major beach entering Northshore and will always be a an major attraction like a reverse Sunset Beach coming from the east side and changes done there.

Laniakea is the first stop to surf, see turtles enjoy the beach, fish and sightsee both visitor and local.

Once upon a time the highway was Pokakuloa road , then was moved out as population grew.

In times now and future we have grown with visitors and local population.

Now is time to plan safety not with a bandaid but for the future of time.
Aloha
Hans Hedemann

From: Joey Ekstrom <jcekstrom@gmail.com>
Sent: Monday, March 29, 2021 3:14 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea Realignment

I've looked through the different proposals I received in the mail. The biggest concerns for me are the safety issues and the traffic congestion. It seems like the "Pedestrian Shift" would be the best solution would be the best to address those. Larger numbers of people are going to continue to go to Laniakea. It's a fact of life. I think it would be best to make the investment now. The number of people is only going to continue to grow. It also seems wise to move the road farther away from ocean encroachment.

From: kennywalshaloha@aol.com <kennywalshaloha@aol.com>
Sent: Thursday, February 25, 2021 7:47:24 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] LANIKEA TRAFFIC SOLUTION

ALOHA!

MY NAME IS KENNETH WALSH AND MY WIFE AND I RESIDE AT 61-736 PAPAILOA RD. HALEIWA HI.96712. WE HAVE LIVED HERE SINCE 1975 AND HAVE SUFFERED THROUGH THE LANIKEA TRAFFIC PROBLEM FOR YEARS!!!
IT HAS BEEN STUDIED FOR OVER 10 YEARS AND A SOLUTION IS WAY OVERDUE!!

WE BOTH FEEL THAT THE "PEDESTRIAN SHIFT" ALTERNATIVE IS BY FAR THE BEST WAY TO GO!!

I HOPE YOU MOVE ON THIS PROJECT POST HASTE!!

THANK YOU!

KENNETH WALSH
808-280-1178

From: Marina Hoshi Whyte <marinahoshi@gmail.com>
Sent: Saturday, March 13, 2021 8:32 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea Realignment Project - Pedestrian Shift

Hi Brian,

I received the project update from Tracy and carefully read those four plans you are presenting.

Pedestrian Shift was my favorite for the following reasons:

I like the fact that you need to block the existing parking area during the construction. This may be the reason that surfers oppose this plan, which I totally understand. But when you think of this as a turtle traffic problem, there is a good chance that while Laniakea beach is sort of off limits for a few years, tourists and tour companies will find another beach to view turtles. Laniakea was the first beach that turtles had started to come back, and with the Hawaii Tourism Authority-funded Malama Na Honu (see the link below), it became the official turtle viewing spot. However, now there are more turtles around Oahu in general, so I'm sure that people can find other places to take photos of turtles, such as Haleiwa Alii beach park,Turtle Bay resort, or the East side. Even if some of the tourists come back after construction is complete, once the idea that there are other turtle viewing spots is widely shared, visitors won't be too obsessed with Laniakea.
https://malamanahonu.org/product/laniakea-ohana/

The ocean side parking eliminates the danger of pedestrians crossing Kam Hwy. I understand that one of the claims by the group that sued HDOT was that disabled people need close parking. This may not be a major point, but still it would be good for everyone to be able to say that there is (sort of) a handicap access.

Just like at Sunset Beach, the erosion is progressing very fast here at Laniakea. Please see the attached photo from the summer of 2020. If you spend any money doing anything to Laniakea it should be to move the road inland. This plan is the only one out of four that moves the road inland.

I know that some people want the road to move even further inland and create a beach park at Laniakea. I oppose this idea. Laniakea beach is too small to begin with and now is quickly disappearing. Any effort to create a beach park will be wasted. In the summer the slippery rocks are exposed and are very dangerous to walk on. Visitors walk west to swim, and the lifeguards can't see them from their tower. The state should not mislead tourists to believe that Laniakea is a safe place to swim. And of course the green sea turtles, a threatened species, shouldn't be bothered by any more beachgoers.

If you plant trees and block the ocean view from the road, tourists will likely just drive through and won't realize that there are people on the beach doing something (taking photos with turtles). I know a community member who has said for years that if we just plant trees and block the view, we can improve the traffic flow dramatically. I didn't know who to ask to plant trees along Kam Hwy, but this plan comes with new vegetation and it's perfect! Just like the drivers' safety improved after the HDOT had blocked the ocean view at the Waimea Bay with the concrete walls, Laniakea needs a hedge.

We will be given extra space in front of our house for vegetation. My biggest concern has been that we need to be able to see oncoming traffic when we leave our driveway. In the past, some visitors had parked on the left side of our driveway completely blocking our visibility. That was really dangerous. If we have this extra space for vegetation, we should be able to trim and keep the trees short in a way that we can always see the oncoming traffic.

The street lights currently shine on the beach, which is not ideal for marine animals. Having street lights on the mountain side is a good idea.

Concerns:

During the construction, people will try to park in front of our house and block our visibility. That will put us in danger. If you could provide us with No Parking signs, that would be great.

If everyone then parks on the mauka side (in front of the horse ranch and Alluvion) and crosses Kam Hwy to get to the makai side, someone could get hurt, which is what you are trying to avoid. So the No Parking signs there may also be needed.

We don't see people walking or riding bikes on this part of Kam Hwy too often. It's too dangerous. There is no bike path to connect to like at Sunset Beach. Therefore, the one lane you are keeping for the bike path may be better used as extra vegetation. I am afraid that this paved space maybe used for things like lunch wagons, surf school tents or large parties. Plants are better for erosion control than the leftover road anyway: Naupaka, Vetiver, Beech Heliotrope, Sea Grapes, Kamani, Coconut, etc.

Thank you very much for working on this project. I hope things can move forward soon.

Aloha,

Marina Whyte

From: Michael Berman <mberman@firstrangemanagement.com>
Sent: Sunday, March 28, 2021 8:21 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Kamehameha Highway pedestrian safety project

Brian sorry for the delayed response, we've been traveling. First I'd like to congratulate you on a great presentation and nice executive summary.
In an effort to shorten my response, in summary we would be in favor and support the "pedestrian shift alternative" . Admittedly more expensive and a longer construction project, the end with justify the means. Looking to the future.... this is the right solution for the North Shore. Happy to discuss any of this at your convenience. Thank you for your continuing efforts.
61- 469 Kamehameha Highway
MB

Michael Berman
First Range Management
6255 Habitat Drive, Suite 3005
Boulder, CO 80301
Office: 303-444-7777
Mobile: 303.638.1999
mberman@FirstRangeManagement.com

Please send emails to mberman@FirstRangeManagement.com

From: Michael Lyons <mlyons001@icloud.com>
Sent: Saturday, January 30, 2021 4:55 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Aloha Brian. Regarding laniakea I'm in favor of the pedestrian alternate. I have been involved with cultural services and Nicole Ishihara. The area is heavily involved with cultural sites. I am not in favor of disturbances to these sites.

Sent from my iPhone

From: Richard Whyte <whyte.richard@gmail.com>
Sent: Saturday, March 6, 2021 3:51 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea

Hi Brian,

The Pedestrian Shift option is of course the best choice to keep people off of highway. However, cars should not be backing on to highway out of stalls. We suggest exit north and south at pohakuloa road connection with with merging lanes. Use old highway for access to new parking lot.

Thank you

Richard Whyte
Area resident

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MAR 29 2021
WSP USA INC.
HONOLULU, HAWAII

March 22, 2021

Mr. Brian Tyau

Subject: Kamehameha Highway
Pedestrian Safety Project
Vacinity Of Laniakea Beach
Proposed Highway Realignment

In regards to this proposed highway realignment in the vacinity of Laniakea beach, we would like to thank you/DOT for all their efforts put fourth on this proposed project. As concerned citizens of the north shore we have been involved in the proposals/fix to the on going health and safety issues for about 20 years. We have, and attempted to inform many on the need to address this huge traffic issue and the health and safety concerns.

During our efforts to bring attention to a proposal/fix and other related concerns, we found that there were plans for the Laniakea beach area that many were unaware of. These plans were tourist and recreational oriented with other possible activities that would put a negative affect on this beach and area. This plan would also affect traffic and become a major safety and health issue.

Once we got much of the proposed plans for the area, we tried to work with the north shore neighborhood board to stop a proposed support park development. (More Info. available.) This proposal had many issues connected to it that needed to be addressed. Attending meetings, meeting with many or contacting by other means, including north shore neighborhood board members, concerned residents, some political leaders, HDOT, cultural survey personnel, other cultural experts, city parks people and more, has given us a very broad understanding and related knowledge of this issue/subject.

The main issue is and has always been the health and safety issues but not limited to it. There is much more to solving this issue that includes this beach, affects on the ocean, the turtles, Hawaiian culture, ag lands, private property and so on.

We appreciate so much those people that gave us an opportunity to share our findings, knowledge and related information prior to moving forward, planing and designing the highway realignment in this area.

All the negative talk about the HDOT by members of the north shore neighborhood board was incorrect to say the least.

As I have mentioned in other letters and or discussion over the many years, the community had agreed with us to the least invasive fix for this area of the highway in the vacinity of Laniakea beach. This was voted on a number of times and had always been to do as we first proposed from the first meeting that we attended on this issue.The fix was for us to drive where people park and park where we presently drive. At all voting on this issue, it was agreed by over 90% voting to do the least invasive. Our proposal has almost aligned with the HDOT plans on page 9. The small group of opposing people that continue to move toward Hawaii becoming a recreational or playground for the rich, and other selfish reasons, will continue to try to get what they want by any means. They put greed and personal benefit ahead of our quality of life, and many other very important things.

Years of information, studies, and related data etc. was discussed as I have mentioned, with so many. Meetings, letters and other related conversations with the HDOT group/team on the proposed fix/realignment plans etc., were very important as they intended to get as much information as possible on this issue. This group/team from the HDOT was and still is very serious and determined to be as informed as possible moving forward with this project.

This HDOT never made us feel that what we had to share or our concerns were not of some importance to them and their work moving forward and we so appreciate that.

Their efforts to address all the concerns is of great importance to this group/team and is greatly appreciated because most of the concerns are important and needs to be addressed correctly and timely.

As stated, we believe that HDOT's plans as is on page 9, from information we recived from the HDOT, is the least invasive. The HDOT has given necessary consideration for Hawaiian culture, agriculture lands, private Hawaiian lands/Kamehameha Schools, cultural connection/flow to Laniakea beach which is part of the cultural connection and flows from mauka to Laniakea beach.

We also feel that the huge health and safety, traffic and other related issues will be greatly improved, if not many eliminated with this HDOT plan.

As many of us on the north shore and throughout the islands ponder thoughts of tourism being placed above all else, many of us try to save what we can of Hawaii as it should be or was.

Hawaii is unique in many ways and should be protected and the people, culture and lands also respected. Hawaiians are an agriculturally sustainable type of people with much culture. Many plans for additional parks and recreational development is to enhance and increase tourism that cause more problems, displace the indiginous life style/way of life, people, quality of life for many and create more homeless/houseless, etc..

The plans for the north shore, beaches etc., seem to be obvious as we continue to move toward a recreational area and development for the rich. Hawaii's leadership, political and other also continue to allow development of ag lands for other then agriculture. This management style continues to draw more outside money to Hawaii as it displaces Hawaiians and other local families. Many here can no longer compete or handle the cost of living and other related issues and must leave to survive or for a better life.

Back to the realignment pedestrian safety project in the vacinity of Laniakea, again, we feel that the plan as seen on page 9, (is the best way to address all issues and or related problems).

We don't know how to thank the people at the HDOT that have allowed us to participate and address our concerns on this very important issue. We hope that the HDOT team/group and others involved in solving this emergency issue in the area of Laniakea on Kamehameha highway will be able to move forward with the plan as shown on page 9.

If we can be of any assistance for anything at any time, please do not hesitate to contact us. We will be more then happy to help.

Sincerely,
Robert Robinson

Robert Robinson
North shore resident

From: Email Service <tj4dogs@aol.com>
Sent: Thursday, April 8, 2021 12:38 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] laniakea realignment issue

Aloha Brian, I am one of the many North Shore residents that travel Kamehameha Hwy daily between Pupukea and Waialua. The traffic issue at Laniakea is a simple fix.
If I am understanding the proposals properly, the only one that is viable is the Pedestrian Shift alternative. Moving the highway mauka and leaving parking on the makai
side is the ONLY way to alleviate traffic backing up and causing traffic jams. Anywhere on the mainland you will have the ocean, then the parking, then the highway on the
mauka side of the parking lot. ANY alternative that has people walking across traffic is a no go. We have put up with this for TOO LONG and appreciate the opportunity to
input. Hope this comes to fruition without taking any more time. Its the only way to fix this mess. Realign the highway.
Mahalo, Tina Jensen

-----Original Message-----
From: Will Eilert <WEilert@ema.us>
Sent: Friday, March 26, 2021 4:09 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] bypass

Super to hear something may be done after 20 years of traffic nightmare! I live on papailoa and unfortunately have had to deal with this problem. The only option is #2 — moving kam Highway is totally unrealistic — it would take another 10 years similar to the rail project — let us put up the barriers and allowing entrance from haleiwa side and exist from north side! I can donate the paint for the walkway crosswalks !! Let’s get this going now!! If i did surgery like the state of hawaii has taken care of this problem — i would be in jail!! Wiliam t. Eilert, MD

Appendix

A-2

Comments and Responses to the Draft Environmental Assessment

APPENDIX A-2
COMMENTS AND RESPONSES TO THE
DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
KAMEHAMEHA HIGHWAY PEDESTRIAN SAFETY PROJECT VINCINITY OF LANIAKEA BEACH

This report summarizes and responds to public comments on the Draft Environmental Assessment (Draft EA) for the Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach. The proposed project's Draft EA was announced in the August 23, 2021 edition of The Environmental Notice, initiating the 30-day public comment period that concluded on September 22, 2021.

Twenty-four stakeholders or agencies submitted written comments on the Draft EA via e-mail or letters during the 30-day comment period, while four individuals or agencies submitted written comments after the deadline. Although State regulations specify that comments received after the Draft EA comment period need not be considered or responded to in the Final EA, HDOT elected to consider and include substantive comments received after the deadline (Hawaii Administrative Rules (HAR) §11-200.1-20).

The following agencies and stakeholders provided comment on the Draft EA during the 30-day comment period:

<u>State of Hawaii Agencies</u>
Department of Land and Natural Resources, Engineering Division
Department of Land and Natural Resources, Land Division-Oahu District
Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Office of Planning and Sustainable Development

<u>City and County of Honolulu Agencies</u>
Board of Water Supply
Department of Design and Construction: Facilities Division
Department of Planning and Permitting
Honolulu Fire Department

<u>Elected Officials</u>
Councilmember Heidi Tsuneyoshi
Senator Gil Riviere

<u>Individuals, Businesses, Organizations, and Community Groups</u>
Beau Sheil
Bill Quinlan
Douglas Meller
Hawaiian Electric Company
Joanne Martin
Joe Wat
Kamehameha Schools
Laura Figueira
Patrick and Mahea Holtzman

Racquel Hill-Achiu
Sara Ackerman
Stanford Brown
William W. Saunders Jr.
University of Hawaii, at Manoa, William S. Richardson School of Law (*Professor Denise Antolini, Grant Barring, Joel Burgess, Charlotte Frank, Mark Cave, Meyer Cummins, Hi`ilei Casco, Palakiko Chandler, Kendrick S. Chang, Kenneth Go, Ying Gu, Debora Halbert, Joho Horton, Cale Honda, Jennifer Hee, Pa Ly, Tisha McKinney, Jake Ruby, Noah Hoshino, Kolby Kahahawai, Johnathen Kawakami, Loredana Craciun, Josiah K. Seawell, Gillian Kim, Shari Matsudo, Sarah Anne Mau, Evan Miyaki, Micah Miyasato, Elizabeth Songvilay, Abe Yi, Naima Te Maile, Farah Danial Mok, Chrisopher Pang, Claire Rossi de Leon, Diego Rivera, Kealapono Richardson, Siena Scharr, Kanani Smull, Malia Staab, Ionatana Tua, Olivia Wang, Kellie Wong, Alyssa Coushie, Christian Doles, Mona Heydarian*)

The following agencies and stakeholders provided comment on the Draft EA after the comment period ended on September 22, 2021:

<u>State of Hawaii Agencies</u>
State of Hawaii Department of Health, Clean Air Branch

<u>City and County of Honolulu Agencies</u>
Department of Parks and Recreation

<u>Individuals, Businesses, Organizations, and Community Groups</u>
North Shore Neighborhood Board #27
Sandra Cashman

Copies of these correspondences are provided as an attachment to this Appendix.

Draft EA Comment Evaluation Process

The Hawaii Administrative Rules (HAR) governing public review and responses for a Draft EA require that proposing agencies respond to all substantive comments received (HAR §11-200.1-20 (d) (1)). The determination on whether a comment is substantive is left to the proposing agency to consider the comment's "validity, significance, and relevance of the comment to the scope, analysis, or process of the EA, bearing in mind the purpose of this chapter and Chapter 343 HRS (Hawaii Revised Statutes)" (HAR §11-200.1-20 (d)). Essentially, substantive comments do one or more of the following:

- Provides insight or questions, with a reasonable basis, on the accuracy or adequacy of the information and/or the analysis within the Draft EA;
- Provides insight, questions, or presents reasonable alternatives other than those presented in the Draft EA that meet the purpose and need of the action and addresses important issues;
- Provides insight or questions, with a reasonable basis, the merits of an alternative or alternatives;
- Causes changes or revisions to the proposed action;

- Provides insight or questions, with a reasonable basis, the adequacy of the planning process itself.

Conversely, basic expressions of personal opinions or preferences that are not relevant to the adequacy or accuracy of the Draft EA or represent commentary regarding agency resource management not relevant to the project are considered non-substantive.

There were 334 individual comments delineated from the letters and emails received and placed in matrices with responses. The matrices have been divided into the following categories: *State of Hawaii Agencies*, *City and County of Honolulu Agencies*, *Elected Officials*, and *Individuals, Businesses, Organizations, and Community Groups.*

HAWAII STATE AGENCIES

Commenter	Comment	Response
Department of Health, Clean Air Branch	Standard Comments for Land Use Reviews Clean Air Branch Hawaii State Department of Health. If your proposed project: <u>Requires an Air Pollution Control Permit</u> - You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch. <u>Includes construction or demolition activities that involve asbestos</u> - You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch. <u>Has the potential to generate fugitive dust</u> - You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does not require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems. Construction activities must comply with the provisions of Hawaii Administrative Rules, §1160.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints. You should provide reasonable	An Air Pollution Permit is not required. Air quality is discussed in Section 3.14 for long-term impacts. No long-term avoidance, minimization, or mitigation measures are proposed. Section 3.16.2 discusses short-term impacts due to construction, including any measures that would be implemented to control fugitive dust.

Commenter	Comment	Response
	measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following: - a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact; - b) Providing an adequate water source at the site prior to start-up of construction activities; - c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase; - d) Minimizing airborne, visible fugitive dust from shoulders and access roads; - e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and - f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site. If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch	
Department of Land and Natural Resources (DLNR), Engineering Division	The rules and regulations of the National Flood Insurance Program, Title 44 of the Code of Federal Regulations, are in effect when development falls within a Special Flood Hazard Area (High-risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by	The design that DOT is proposing is in compliance with NFIP. Please see Appendix I for details.

Commenter	Comment	Response
	the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards. The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's FIRM. The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (http:gis. hawaiinfip.org/FHAT) could also be used to research flood hazard information.	
DLNR, Land Division-Oahu District	We believe HDOT should continue to maintain the improvements makai of the realigned highway upon its completion, regardless of whether the lands stay with DOT or are transferred to DLNR to be unencumbered lands within the shoreline. If necessary, authorization from the Land Board enabling DOT to conduct maintenance work can be processed, too.	HDOT intends to retain ownership of both the existing Kamehameha Highway right-of-way and the realigned area, as shown in the typical section at this time.
DLNR, Office of Conservation and Coastal Lands (OCCL)	The OCCL supports HDOT's efforts to improve pedestrian safety while also attempting to address the anticipated impacts of climate change and sea level rise to roadway reliability.	Thank you for your comment.
DLNR, OCCL	Th OCCL notes that it does not appear that our office received HDOT's January 26, 2021 Pre-Draft EA Scoping and Request for Comments letter. Based on Appendix A of the Draft EA, it does not appear that the other Divisions within the Department received the letter or were able to provide preassessment comments as well.	DOT has since met with your office to discuss your concern.

Commenter	Comment	Response
DLNR, OCCL	According to OCCL files, past correspondences have stated OCCL's support for the proposed realignment of Kamehameha Highway near Laniakea Beach and Chun's Reef to reduce vulnerability to coastal erosion and wave inundation. Past correspondences also indicate OCCL's support for the "Most Realignment" Alternative contained in Section 2.5 Other Alternatives Considered but Eliminated of the DEA but was removed from consideration due to impacts on cultural and historical resources, cost, schedule, and effects on Kamehameha Schools' property according to the DEA.	Yes, the "Most Realignment" Alternative was previously viewed as the best option. However, it has since been removed for the reasons you listed. The Kamehameha Highway Pedestrian Safety Project is now being funded differently with a smaller budget and shorter schedule.
DLNR, OCCL	Based on the July 30, 2020 certified shoreline, it appears that the portion of the existing Kamehameha Highway that is makai of the shoreline lies within the Conservation District Resource Subzone and may be considered a nonconforming use. The DEA and the preferred alternative (the Pedestrian Shift Alternative) identified in the document appear to indicate that the character of use of this portion of Kamehameha Highway will change the realignment of the highway.	Yes, thank you for your comment. DOT followed up with your office with a meeting that was held on October 5, 2021. DOT is currently seeking an opinion from the AG's office.
DLNR, OCCL	The OCCL requests that the Final EA further clarify if the HDOT will continue management of the existing right of way makai of the shoreline or if the lands will be unencumbered as defined in Hawaii Administrative Rules (HAR), 13-221-2. As it appears that new land uses are being proposed makai of the certified shoreline, it appears that further consultation with the OCCL and authorizations from the Department may be needed.	HDOT intends to retain ownership of both the existing Kamehameha Highway right-of-way and the realigned area, as shown in the typical section at this time.
DLNR, OCCL	The FEA should also address how the proposed project(s) will comply with HAR 115 and maintaining a free and	DOT plans to remove half of the existing roadway and let it naturalize. As discussed during the

Commenter	Comment	Response
	clear beach transit corridor from physical impediments such as human-induced, enhanced, or unmaintained vegetation. No improvements should be proposed makai of the shoreline other than the removal of man-made structures. The project areas identified makai of the shoreline should be allowed to naturalize to facilitate the migration of the shoreline and beach transit corridor.	October 5, 2021 meeting with your office DOT is currently seeking an opinion from the AG's office. DOT will develop a Maintenance Plan for the vegetation.
Office of Planning and Sustainable Development	No Comment	N/A

CITY AND COUNTY OF HONOLULU AGENCIES

Commenter	Comment	Response
Board of Water Supply	Construction drawing should be submitted to BWS to minimize impact to water system in the area.	Thank you for the guidance.
Department of Design and Construction: Facilities Division	The property referenced in Section 3.2 is less than 3 Acres. The project would require the entire parcel, not a portion. TMK #6-1-005-024.	Your comment is noted. The project design is still in progress, and we will continue to coordinate with your office moving forward to determine any acquisition needs. This was noted in the Draft EA in Section 3.2.2.
Department of Design and Construction: Facilities Division	Will the state be responsible for the area since it will be state property?	Yes, DOT will be responsible for everything in its ROW. However, OCCL questioned whether in those areas where there is no pavement or the shoreline has eroded the roadway, whether that land is instead considered unencumbered and under the jurisdiction of OCCL. OCCL advised that HDOT consult with the Attorney General's office (AG) on this question, as well as whether the shared use path would still be

Commenter	Comment	Response
		considered part of the transportation facility under HDOT jurisdiction or is a non-conforming use. OCCL defers to the AG opinion. The appropriate approval process will be determined once the AG has reviewed.
Department of Design and Construction: Facilities Division	Section 2.2. The City has already moved the cattle fence mauka of the current highway.	Your comment has been noted.
Department of Design and Construction: Facilities Division	Will the state build and maintain all improvements described in the Pedestrian Shift Alternative?	DOT plans to build and maintain all the improvements within the Pedestrian Shift Alternative. DOT may enter into other agreements with other agencies should the City or DLNR move forward with plans for beach support facilities in this area.
Department of Design and Construction: Facilities Division	In reference to ROW Table 3-2. The state should acquire all city land in the area. Based on the estimates in the table, the land left un acquired would result in an unusable sliver.	Your comment is noted. The project design is still in progress, and we will continue to coordinate with your office moving forward to determine any acquisition needs. This was noted in the Draft EA in Section 3.2.2.
Department of Design and Construction: Facilities Division	There should be no City obligation to develop the land for park use since it will be acquired by the state.	Your comment is noted. DOT does not determine the City's obligations.

Commenter	Comment	Response
Department of Design and Construction: Facilities Division	Property boundaries and impacts should be shown in Figure 1-5.	A new figure has been added to Section 3.2 of the Final EA.
Department of Design and Construction: Facilities Division	Property boundaries and impacts should be shown in Figure 1. Will the state be acquiring the property from the City?	A new figure has been added to Section 3.2 of the Final EA.
Department of Design and Construction: Facilities Division	What is the impact on City property? Will the state be acquiring the City property? It appears that a significant portion of the property would now be state. It appears that City will no longer have a beach park. Will DOT be doing all of the improvements? Will the State manage the parking and landscaping?	Your comment is noted. The project design is still in progress, and we will continue to coordinate with your office moving forward to determine any acquisition needs. This was noted in the Draft EA in Section 3.2.2. Also, a new figure has been added to Section 3.2 of the Final EA. DOT will maintain the facilities that are within our right-of-way.
Department of Parks and Recreation	The Department supports the Pedestrian Shift Alternative	Your comment is noted.
Department of Planning and Permitting (DPP)	1.a. Is there adequate public access to diverse coastal recreation opportunities, like beaches, rec areas, and natural reserves provided by dedication or other means? If so, describe how the access consistent with sound conservation principle.	There is access to Laniakea Beach from the Kamehameha Highway. DOT is replacing an existing facility and is not providing / creating any additional accommodations. However, due to roadway shift there is additional open area for access. This project is not intended to change the existing

Commenter	Comment	Response
		usage of Laniakea Beach because its usage is determined by tourism and general population.
DPP	1.b. Is the site near any identified scenic resources? If so, how will the project limit interruption of those views? Use resources such as 1987 Coastal View Study and North Shore Sustainable Communities Plan to identify scenic resources.	The project references the North Shore Sustainability Community Plan (Section 3.17.2). As planned, it remains consistent with the guidelines pertaining to scenic resources and views as identified.
DPP	1.c. How will the development be designed to minimize impacts from floods, wind damage, storm surge, landslides, erosion, sea level rise, siltation, or failure in the event of an earthquake?	Please see Section 3.1, as well as Appendix D for a discussion of coastal processes and Appendix I for the discussion on flooding. The road is unlikely to be impacted by winds, landslides, siltation, or earthquakes.
DPP	1.d. How does the project comply with the National Flood Insurance Program and the provisions of Chapter 21A, Revised Ordinances of Honolulu?	Please see Section 3.1 for a summary and Appendix I for the Study of FIRM mapping.
DPP	1.e. Will the project Exacerbate Coastal flooding? If so, what mitigations proposed? How was that determined?	No, please see Section 3.1, as well as Appendices D and I for comprehensive discussions of coastal flooding and processes.
DPP	1.f. Please include an analysis on hurricanes, storm surges, and earthquakes in project area.	Oahu is in the Uniform Building Code seismic zone 2A for earthquakes. Please see Appendix D for a discussion of storm surges and erosion.
DPP	1.g. Are there cumulative adverse effects/impacts relating to individual developments within the plan, each of which taken by itself might not have a significant adverse effect? If so, how will they be mitigated?	No, the project replaces existing facilities.

Commenter	Comment	Response
DPP	1.h. Does the project eliminate future planning options?	No, it does not. The roadway shift provides additional open area which in the future may be modified for a parking lot. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency.
DPP	2. Final EA should list and address all relevant policies and guidelines of the NSSCP and the General Plan. Final EA should include Discussion on how proposed action comports with Sections 3.3.2.3 and 4.1.1 of the NSSCP. Please note that the NSSCP is currently under review for revisions and the General Plan is under revision at Council as Resolution No. 21-23.	Section 3.17.2 of the EA has been revised.
DPP	3. Plans should show shoreline and shoreline setback. The Final EA should indicate what parts of the Project will be within the shoreline and will need a Shoreline Setback Variance (SSV). Certified shoreline survey will be required in the SSV application.	Thank you for the guidance. The subdivision application will be submitted after the SMA and SSV. A certified shoreline will be provided for the SSV. Please refer to Figure 3-15. Additionally, the DOT has participated in the NSSCP CPAC (North Shore Sustainable Communities Plan Citizens Planning Advisory Committee) meetings in which the project was shared.
DPP	4. The Draft EA indicates that the USACE conducted a site visit and found no wetlands that will be impacted by the Project. The new bridge appears to be directly over Lauhulu Stream and the Draft EA states that no abutments or structures will be in the stream bed or any wetlands. A summary of the consultation with USACE should be included in the Final EA. the SMA Use Permit app should	DOT is continuing to coordinate with the USACE. The SMA Use Permit Application will include confirmation from the USACE that a Department of the Army Permit is not required.

Commenter	Comment	Response
	include confirmation from the USACE that a Department of the Army Permit is not required.	
DPP	5. FEA should include a narrative describing the Project's post-construction stormwater quality strategic plan to comply with "Rules Relating to Water Quality". The narrative should include a written description of the proposed development, expected activities and pollutants that will be generated by activities at the site, and Low Impact Development site design strategies that will be used to comply with the Rules and include a development schedule. The Projects compliance with the Rules Relating to Water Quality will be verified at the time that the grading/construction plans are submitted to DPP for review.	The project meets the requirements of the Storm Water Permanent Best Management Practices Manual from the State of Hawaii Department of Transportation Highways Division. Based on our meeting with your department on October 5, 2021 DOT's requirements are sufficient for City standards.
DPP	6. The project site is within the SMA and Section 2.7 of the DEA suggests SMA Use Permit and SSV will be required. Please note that SMA Use Permit requires a presentation to the Neighborhood Board prior to submittal, pursuant to Ordinance No. 21-27.	A presentation was made to the Neighborhood Board on September 28, 2021 and DOT has confirmed that another will not be necessary for the SMA process.
DPP	7. The SSV will be reviewed under the public interest standard. The SSV app will have to discuss how the project will clearly be in the public interest, is the practical alternative which best conforms to the public of Chapter 23, Revised Ordinances of Honolulu, and the shoreline setback rules.	Thank you for the guidance.
DPP	8. If the Pedestrian Shift Alternative is implemented, the highway realignment will be subject to a subdivision application. Construction within the floodplain is subject	Thank you for the guidance. The subdivision application will be submitted after the SMA and SSV. The subdivision process requires a certified

Commenter	Comment	Response
	to compliance with the provisions of the City's Flood Hazard Ordinance and the National Flood Insurance Program.	shoreline and also verification that the SMA and SSV permits have been obtained. Based on the project team's meeting on October 5, 2021 with your agency, DOT's documentation of conformance with the NFIP is sufficient for the subdivision application's purposes.
DPP	9. Based on the info provided in the DEA, a grading permit is required. Based on preliminary drainage report prepared by WSP, the drainage design criteria that may be used for grading permit purposes is based on HDOT's design criteria, which is more conservative and acceptable. We recommend that the State consider using Plate 6 to determine 100-year peak design flow at the proposed bridge.	Thank you for the guidance.
Honolulu Fire Department	No Comment	N/A

ELECTED OFFICIALS

Commenter	**Comment**	**Response**
Councilmember Heidi Tsuneyoshi	I am greatly concerned for residents of the North Shore should this section of the roadway be compromised as it is the only access road for the area. Residents would be left stranded which could have grave consequences in the event of a natural disaster. Additionally, the congestion on this roadway greatly compromises the ability of our First Responders to respond to emergency situations during which timing could be a matter of life or death. Lastly, the	Thank you for the comment. The shift alternative provides a more reliable highway than the existing conditions.

Commenter	Comment	Response
	quality of life of the residents living in this area have been adversely impacted by the shoreline erosion and influx of visitors and locals alike to this popular area.	
Councilmember Heidi Tsuneyoshi	I ask that HDOT consider the No Build Settlement Alternative as the immediate, short-term solution while working toward the Pedestrian Shift Alternative as the long-term solution which is the preferred alternative by DOT and the majority of community members. I understand that DOT has gone through many iterations and processes throughout the many years of this issue, and I am very grateful for the focused attention at this time and feel it would be appropriate and beneficial to capitalize on the momentum by implementing both the short-term and long-term options. Time is of the essence, and I am advocating for the continued focus forward to expedite the process and hopefully finish ahead of the 2025 schedule for construction completion for the Pedestrian Shift Alternative.	Thank you for the comment. The timing of the No-Build Settlement Alternative is not under the control of DOT.
Senator Gil Riviere	I support the preferred alternative but oppose an indefinite prohibition of all parking in the project area during construction. Temporary parking alternatives should be included in the construction plan. I strongly oppose the TSM alternative or any option that restricts parking. I would support the Settlement Option as a short or interim project. The No Build is unacceptable	Thank you for your input. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.
Senator Gil Riviere	Table ES 3.14 Air Quality Whether statistically significant or not, it seems that air quality would surely be improved when hundreds of	While an interesting observation, the change would not affect compliance with AAQS. Please see Section 3.14 of the Final EA.

Commenter	Comment	Response
	vehicles no longer idle or move slowly through this traffic bottle neck. I have the same comment relating to "3.14.2 Potential Impacts".	
Senator Gil Riviere	Table ES 3.15 Social and Economic Conditions Resident quality of life would be tremendously enhanced by resolving this traffic bottleneck and saving 30 minutes each way. Employers would benefit greatly by not having to pay their employees to sit in traffic, wasting time, productivity, and fuel.	Thank you for the comment. This information has been added to the Executive Summary and Section 3.15 in the Final EA.
Senator Gil Riviere	1.0 Introduction At the first task force meeting on 1/25/2012, the first item listed under Purpose and Need was "Improve safety and accessibility (for pedestrians, accessing beach, bicyclists, and motorists." Recognizing that the task force members were most concerned about congestion relief, the presenter made very clear that safety must be part of the need. Other listed components were reliability, erosion, parking, congestion, and consideration of the parks. (Ex. 1)	Thank you for the comment. The project's initial federal funding source targeted shoreline erosion and roadway reliability.
Senator Gil Riviere	1.4 Project History This section would be improved with additional discussion of efforts to realign this highway. Community advocacy for this project formally began in 2005 when both the North Shore Chamber of Commerce and North Shore Neighborhood Board joined the Oahu Metropolitan Planning Organization Citizen's Advisory Committee. (OMPO CAC) In 2006, the CAC recommended that projects S50 & S42 be consolidated in the proposed FY	The project's history presented in the document is adequate for introducing the proposed project.

Commenter	Comment	Response
	2008-2011 Transportation Improvement Program to "Combine the two projects into a project that would realign Kamehameha Highway mauka at Laniakea Beach." HDOT's response was "Yes – S51 and S76. They can be combined into one contract." (Ex. 2) In 2007, HDOT declined a work element proposal to realign or bypass a section of Kamehameha Hwy at Laniakea for the FY 2008 Overall Work Program. (Ex. 3) The North Shore Neighborhood Board wrote to express the community's disappointment. (Ex. 4) In 2007, the Hawaii State Legislature appropriated $1.2 million dollars for "Plans for the realignment of Kamehameha Highway along the areas of Laniakea Beach and Chun's Reef." HDOT never utilized the appropriation and the funds lapsed in 2009. In 2008, the North Shore Neighborhood Board again expressed its disappointment about lack of action. (Ex. 5) Shortly after the legislature's appropriation lapsed, HDOT reprogrammed $1.7 million of its funds for a traffic alternatives study and environmental assessment. A contract was approved in 2010 for $1.4 million. Notice to proceed was issued January 10, 2011, with a condition to complete the work within 480 calendar days. (Ex. 6) This is the project that included a public advisory group. No final report was published.	

Commenter	Comment	Response
Senator Gil Riviere	Page 2-11 "Kukaeohiki" Check the spelling, this name is Kukaiohiki elsewhere.	Spelling has been revised accordingly.
Senator Gil Riviere	Figure 3-10. Proposed City and County of Honolulu Parks The Mauka portion is labeled Proposed Laniakea Park, but this is part of the Proposed Kawailoa Park. The label should be corrected. (Ex. 7)	Figure has been revised accordingly.

INDIVIDUALS, BUSINESSES, ORGANIZATIONS, AND COMMUNITY GROUPS

Commenter	Comment	Response
Beau Sheil	The TSM Alternative may move pedestrians to other parts of the highway If they can find additional parking. This was seen when the mauka informal parking was blocked and visitors parked their cars a half mile or more on either side of the barriers. I suggest the Executive Summary be more definite about this issue.	The Executive Summary has been revised to include information regarding parking impacts. Please note that this issue is addressed in row 3.10 of the Executive Summary as part of the discussion regarding the TSM Alternative.
Beau Sheil	It was commented that utility poles and wires have bad effects on the view of the beach. Surely this level of construction would provide a low-cost opportunity of undergrounding the poles and wires for the extent of the project.	Undergrounding of utilities is not part of the project. DOT intends to leave utilities not associated with Kamehameha Highway in-place.
Beau Sheil	This proposal brings all the traffic back onto the old Kam Hwy near Pohaka Loa Way. But this is going to recreate the problem at Chuns Reef- it is already beginning to	This project is intended to address the pedestrian safety issues in the vicinity of Laniakea Beach.

Commenter	Comment	Response
	happen. Please consider providing a similar solution at Chuns Reef.	
Bill Quinlan	On page 45 of the DEA (2.5.6 Pedestrian Shift Alternative Configuration Options) it is stated that Pohaku Loa Way could not be considered as the way to connect back to the highway because it is a private street. Is it the understanding of the North Shore Neighborhood Board Laniakea Committee that Pohakuloa Way would be the only access to the parking area and that vehicles would not be able/allowed to access the parking from the highway. Can you please advise what the plan is for parking access?	Pohakuloa Way is not the access to the parking area. A gate will be installed on Pohaku Loa Way for residential access. Access to the parking area is from Kamehameha Highway.
Douglas Meller	I support the proposed highway realignment. However, I am concerned about the safety and traffic impacts of the DEA proposal to allow unregulated vehicle access from the makai side of the realigned highway. Based on DEA figures, the Preferred Alternative could allow left and right turns from, left and right turns onto, and even vehicles backing onto roughly 600 to 700 feet of realigned highway mauka of Laniakea Beach. All of these turning movements currently occur on the existing highway.	There will be a new refuge lane that will facilitate turning movements into the area makai of the realigned Highway that could be used for informal parking.
Douglas Meller	To avoid pilikia, I suggest that the DOT modify the Preferred Alternative by:	Thank you for the suggestion. These alternatives may be considered by other agencies should the City or DLNR move forward with plans for beach

Commenter	Comment	Response
	Providing a one-lane one-way road for vehicle access to unimproved property makai of the realigned highway. (To encourage dialogue, I have prepared figures which illustrate two conceptual alignments. There are many other reasonable alignments. Costs could be reduced for the conceptual alignment shown in Figure 1 by including a strip of existing highway pavement as part of the one-way road. The conceptual alignment shown in Figure 2 could facilitate development of a parking lot for 80 cars.) Allowing highway access from the proposed one-way road. (It would be desirable to allow both left and right turns onto the realigned highway. A competent engineer would need to determine where to locate and how to design highway access.) Restricting other vehicle access from the makai side of the realigned highway.	support facilities in this area. DOT does not endorse parking makai of the certified shoreline.
Douglas Meller	On page 2-14 the DEA stated that, "Any alternative that leaves Kamehameha Highway as a frontage road was rejected because HDOT cannot retain two parallel/redundant routes." A DOT policy which prohibits parallel/redundant DOT routes for through traffic would not apply to a one-way road which has no function other than public access to scenic views and informal parking on DOT property makai of the realigned highway. Moreover, the DOT has constructed one-way	The project team agrees that the prohibition on parallel DOT roads would not apply to your suggestion.

Commenter	Comment	Response
	access roads for scenic pullouts along other state highways.	
Douglas Meller	I request modification of the Preferred Alternative to include reconfiguration of guardrails and retention and repurposing of a continuous strip of existing highway pavement to provide westbound bicyclists with a continuous off-road route along most of the project area. By comparison, the Preferred Alternative currently proposes: retention and repurposing of a wide strip of existing highway for a multi-use path mauka of Laniakea Beach. (I support this.) placement of guard rails and removal of pavement (mauka of Pohaku Loa Way) to prevent westbound bicyclists from exiting the realigned highway and riding westbound on the existing highway pavement to reach the proposed multi-use path. placement of guard rails and removal of pavement (west of the existing Lauhulu Stream bridge) without retaining a continuous westbound route for bicyclists to ride from the multi-use path onto the makai/westbound highway shoulder.	Thank you for your suggestion. DOT will explore these design details as the project progresses.
Douglas Meller	DEA figures for the Preferred Alternative show a 5-foot-wide paved shoulder on the mauka side of the realigned highway. I request modification of the Preferred Alternative to include a 7 foot-wide paved mauka shoulder and pavement striping to create a buffered	Thank you for your suggestion. DOT will explore these design details as the project progresses.

Commenter	Comment	Response
	eastbound bike lane along the entire 0.5-mile project area. According to the "Honolulu Bicycle Facility Design Toolkit", where there is 7 feet of roadway width available for a buffered bike lane, the recommended configuration is a 5-foot bike lane and striping for a flush 2-foot-wide buffer.	
Douglas Meller	Lastly, I request that the Preferred Alternative include some kind of modest improvements to make it safer and easier to walk from the highway pavement to Laniakea Beach. A stacked rock wall within the highway right-of-way, and subsequent wave damage, interfere with pedestrian beach access. I suggest that the DOT ask the DLNR to recommend appropriate mitigation. Simply removing the wall and loose rocks would be costly, accelerate erosion, and not necessarily improve pedestrian beach access. According to DEA Appendix D, "The rock rubblemound revetment transitions from the stacked wall at Turtle Beach and extends approximately 450 ft…. The rock revetment is a continuation of the stacked rock wall from the Turtle Beach reach with larger stone size and vertical height…. As designed, the wall is steep with well inter-locked stones. At damaged areas … stones have been scattered along the beach."	Thank you for the suggestion. DOT will not remove the rock revetment. This improvement may be considered by other agencies should the City or DLNR move forward with plans for beach support facilities in this area.
Douglas Meller	Comments on State acquisition of City Property for Highway Realignment. The City acquired 3 acres of property mauka of the highway at Laniakea Beach because there was no space for parking, a comfort station, or showers makai of the	The project team is in discussions with property owners. DOT is continuing ongoing coordination with the City and DLNR to determined property

Commenter	Comment	Response
	highway. The City first obtained possession/control of this property by a court order on August 2, 1999. At that time the City did not prepare or apply for certification of a shoreline survey. The Final EA should clarify whether the City owns property makai of the most recent (June 30, 2020) certified shoreline at Laniakea Beach. My understanding, which might not be correct, is that unless property boundaries have been determined by Land Court, shoreline certification determines the makai boundary of City shoreline property. If my understanding is correct, then the State owns and the DLNR has jurisdiction for property sandwiched between the existing highway right-of-way and the certified shoreline of City property.	ownership. Any potential effects to these properties are described in Section 3.2 of the Final EA.
Douglas Meller	The Final EA should address how §46-1.5(16)(B), Hawaii Revised Statutes, might affect State acquisition of City property for highway realignment. My understanding, which might not be correct, is that §46-1.5(16)(B) prohibits the City from disposing of shoreline property unless the City receives reasonably comparable property in compensation. It would be desirable for the Final EA to clarify whether the City can accept permanent jurisdiction for State property makai of the realigned highway in exchange for transfer of City shoreline property to the State. §46-1.5 General powers and limitation of the counties.	The project team is in discussions with property owners. DOT is continuing ongoing coordination with the City and DLNR to determined property ownership. Any potential effects to these properties are described in Section 3.2 of the Final EA.

Commenter	Comment	Response
	Subject to general law, each county shall have the following powers and shall be subject to the following liabilities and limitations: ... (16) Each county shall have the power to purchase and otherwise acquire, lease, and hold real and personal property within the defined boundaries of the county and to dispose of the real and personal property as the interests of the inhabitants of the county may require, except that: ... (B) No property bordering the ocean shall be sold or otherwise disposed of....	
Douglas Meller	On page 3-14, the Draft EA disingenuously alleges: The Pedestrian Shift Alternative has been designed to avoid and minimize impacts to the City DPR's undeveloped park parcels to the degree possible. However, this Alternative impacts the Laniakea Beach Support Park to the extent that may require redesign of the facilities described in the EA [January 2005 Final EA for Laniakea Beach Support Park]. The Final EA should instead acknowledge that if the DOT does not acquire all City property mauka of Laniakea Beach any remnant City property mauka of the realigned highway could never be used to provide parking, a comfort station, or showers for public use of Laniakea Beach. In fact, it is unlikely that the City would have any use for remnant City property mauka of the realigned highway.	DOT and the project team's intention was to work toward a solution that would accommodate future plans for the Laniakea Beach Support Park. DOT has coordinated with the City Department of Parks and Recreation and Department of Design and Construction to ensure that future plans, if any, can still be implemented.
Douglas Meller	COMMENTS ON PERMITS REQUIRED FOR THE PEDESTRIAN SHIFT PREFERRED ALTERNATIVE	DOT believes that referring to the existing Shoreline Certification (dated July 30, 2020)

Commenter	Comment	Response
	DLNR certification of a new shoreline survey will be required to determine the mauka boundary of the State Conservation District and the makai boundary of the City special management area and shoreline setback area mauka of Laniakea Beach. Under §13-222-11(a), Hawaii Administrative Rules, the DOT's July 30, 2020 shoreline certification is no longer valid. "§13-222-11 Validity of certified shoreline. (a) Certification of the shoreline shall be valid for a period no longer than twelve months from the date of certification, except where the shoreline is fixed by artificial structures which have been approved by appropriate government agencies…."	remains relevant and still represents the existing situation - where the shoreline is the most makai that it will be established. See Section 2.7. DOT has been in coordination with the City Department of Planning and Permitting (DPP). DPP has indicated that DPP Rules allow this certification to remain valid for up to two years (expiration would then be July 30. 2022).
Douglas Meller	DEA Table 2.1 alleges that: Portions of the project are within the Conservation District, based on Shoreline Certification July 20, 2020. Because all project elements makai of the shoreline are within the existing roadway right-of-way, the State Highway exemption codified in HRS 264-6(2) applies. Conservation District design review or approval is not required for the project. §264-6(2) concerns DOT regulation of the highway right-of-way. Possibly some other statute or rule exempts the highway right-of-way from Conservation District design review. But I doubt the DOT has carte blanche to construct structures within the highway right-of-way which would permanently relocate and artificially fix the shoreline further makai.	DOT is not proposing to install any structures, shoreline-fixing or otherwise, as part of this project. The intention of leaving a portion of the existing Kamehameha Highway in place as a shared-use path is not an installation, but a repurposing of an existing DOT facility for the community's use. HDOT is consulting with the Attorney General's office (AG) on this question, as well as whether the shared use path would still be considered part of the transportation facility under DOT jurisdiction or is a non-conforming use. The Department of Land and Natural Resources Office of Conservation and Coastal Lands (OCCL) defers to the AG's opinion. The appropriate approval process will be determined once the AG has had the opportunity to review the project.

Commenter	Comment	Response
Douglas Meller	When a public hearing is scheduled on the DOT's application for a SMA permit and shoreline variance, I plan to request City permit conditions which require that: -the public will be allowed to park mauka of the existing highway at Laniakea Beach for as long as possible until this would interfere with safe construction of highway realignment. -starting when the realigned highway is open to traffic, for as long as the realigned highway continues in use, the DOT will allow public vehicle access to and parking on public property between Laniakea Beach and the realigned highway.	Thank you for your input.
Douglas Meller	COMMENTS ON PROPERTY MANAGEMENT FOLLOWING HIGHWAY REALIGNMENT The DEA does not adequately address the proposed management of property makai of the realigned highway. I request that the description of the Preferred Alternative in the Final EA include a figure which shows the boundaries of property and a list of improvements makai of the realigned highway which the DOT proposes should be controlled, managed, and maintained by the City. I also request that the Final EA clarify proposed long-term property management if the DOT and the City do not agree on transfer of jurisdiction. Specifically: Will the DOT allow public vehicle access and parking on unimproved property between Laniakea Beach and the realigned highway?	DOT seeks to provide safe highway infrastructure for all users. DOT is replacing the existing informal parking facility and is not providing / creating any additional accommodations. The design is intended to accommodate the City and County Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. DOT has been coordinating with other agencies, but this is a transportation project. DOT will maintain DOT right of way.

Commenter	Comment	Response
	Will the DOT allow the City to provide, maintain, and manage portable toilets, showers, and lifeguard stands between Laniakea Beach and the realigned highway? Will the DOT maintain state improvements, pick-up trash, remove abandoned vehicles, manage vendors, and roust squatters on property under DOT jurisdiction makai of the realigned highway?	
Douglas Meller	COMMENTS ON TRAFFIC IMPACTS FOLLOWING HIGHWAY REALIGNMENT Upstream highway bottlenecks limit downstream highway traffic volume. Fixing upstream bottlenecks without addressing downstream bottlenecks can worsen traffic queues and delays at downstream bottlenecks. This probably will happen to eastbound traffic after Kamehameha Highway is realigned mauka of Laniakea Beach. DEA Appendix B includes figures and tables showing Wednesday and Saturday afternoon eastbound and westbound travel time between Haleiwa and Waimea in January 2020 (with public parking mauka of the highway at Laniakea Beach). It would be interesting and helpful if Appendix B in the Final EA also included figures and tables showing Wednesday and Saturday afternoon eastbound and westbound travel time between Haleiwa and Waimea when DOT jersey barriers prevented public parking mauka of Laniakea Beach. This would allow	Yes, DOT agrees that other traffic bottlenecks can exist and slow traffic in other locations. While the Traffic Evaluation in Appendix B indicates that delays along Kamehameha Highway were consistently created by the facility's inefficiency in processing the vehicle volumes with the pedestrian crossings and activities at Laniakea Beach, it also noted at least one inexplicable slow down near the Waimea Bay end of Kamehameha Highway. Given the primary project objective of pedestrian safety and the preferred alternative to shift Kamehameha Highway inland, at this time the more detailed analysis to quantify other potential factors for delay upstream or downstream of the project area is not warranted.

Commenter	Comment	Response
	comparison of eastbound travel times with public parking and without public parking mauka of Laniakea Beach. On a Sunday afternoon in June 2015, two months before the DOT removed its jersey barriers from the highway right-of-way, my wife and I left my high school 50-year reunion picnic in Malaekahana and drove along the North Shore back to Haleiwa. We observed a slow stop-and-go eastbound traffic queue from the Haleiwa Bypass to Sunset Beach. We also observed a slow stop-and-go westbound traffic queue from Waimea Bay to just west of the last place you could see the ocean at Laniakea Beach. My ad hoc data-free analysis is that the DOT prohibition on parking mauka of Laniakea Beach did not significantly affect eastbound travel delay on that Sunday afternoon.	
Douglas Meller	COMMENTS ON THE NO BUILD SETTLEMENT ALTERNATIVE I request that the Final EA include a public update on the details and status of the proposed Settlement Alternative. I also suggest that the Final EA point out that neither DOT consent nor a lawsuit settlement are required for the City: to obtain jurisdiction to manage State DLNR property sandwiched between the highway right-of-way and the certified shoreline of City property; to prohibit tour buses from unloading passengers on DLNR and City property mauka of the highway right-of-way at Laniakea Beach; and to place a fence slightly mauka of the highway right-of-way with appropriately sized gaps for	The Final EA will have an update on the status of the Settlement Alternative. The No Build Settlement Alternative represents that conditions that would have been created by the re-installation of the barriers. The EA is for a DOT project and does not require a list of actions the City can take.

Commenter	Comment	Response
	vehicular and pedestrian access to unimproved DLNR and City property.	
Douglas Meller	COMMENTS ON THE TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE Closure of all public parking near Laniakea Beach for an indefinite multi-year period would: discourage most Oahu residents from visiting Laniakea Beach; not comply with coastal zone management policies under §205A-2(c)1)(B)(iii & v), Hawaii Revised Statutes; and probably provoke another lawsuit under §205A-6, Hawaii Revised Statutes. The Final EA text and summary tables should be revised to explicitly state that closure of public parking mauka of Laniakea Beach for an indefinite multi-year period would have a “significant effect” under §11-200.1-13(b), Hawaii Administrative Rules. An agency action which discourages most Oahu residents from visiting Laniakea Beach for an indefinite multi-year period would curtail beneficial uses of the environment, conflict with the State’s statutory environmental policies (i.e., coastal zone management policies), and have a substantial adverse effect on community cultural practices (i.e., public recreational use of shoreline lands and waters at Laniakea Beach). §11-200.1-13 Significance Criteria. … (b) … In most instances, an action shall be determined to have a significant effect on the environment if it may: …	Thank you for your comment. DOT intends to move forward with the Pedestrian Shift Alternative.

Commenter	Comment	Response
	(2) Curtail the beneficial uses of the environment; (3) Conflict with the State's environmental policies … established by law; (4) Have a substantial adverse effect on the … cultural practices of the community….	
Douglas Meller	COMMENTS ON REGULATION OF PARKING MAUKA OF LANIAKEA BEACH Some of the summary tables in the Draft EA imply that all public parking mauka of Laniakea Beach is not legal. This is incorrect. Neither the City, the DLNR, nor private property owners have prohibited the public from parking on property which abuts the highway right-of-way near Laniakea Beach. The DOT cannot regulate parking outside the highway right-of-way. And City attorneys, on several occasions, have directed HPD not to issue parking tickets to vehicles parked outside the highway right-of-way mauka of Laniakea Beach.	Yes, agreed. DOT does not support or endorse this informal parking area. It is not within DOT's jurisdiction / mandate to regulate the usage of areas outside of their right-of-way.
Douglas Meller	Unless the DOT authorizes parking, or unless the DOT authorizes another agency to manage/control the highway right-of-way, §264-6(2), Hawaii Revised Statutes, prohibits parking within the highway right-of-way. §264-6 State highway not to be disturbed without permit. No person or government agency, whether federal, state, or county, shall, in any manner or for any purpose do any of the following acts without a written permit from the director of transportation or the director's authorized representative: … (2) Place, erect, leave, or store any … motor or other vehicle … wholly or partially within the right-of-way of any state highway…. When there is no other place to	DOT recognizes that vehicles often park outside the travel way of rural State Highways,e.g., past the white line if one is painted on the road, and the police rarely enforce DOT's prohibition on parking. From a safety standpoint this is the law.

Commenter	Comment	Response
	park for public beach access, most Oahu residents, including myself, believe that the DOT should allow the public to park on the unpaved shoulders of rural State highways. From a practical standpoint, enforcement of DOT parking prohibitions is problematic when it is difficult to determine whether a parked vehicle is within or outside the highway right-of-way.	
Hawaiian Electric Company	No Comment	N/A
Joanne Martin	Supports consideration of extending the realignment to connect with Kam Hwy beyond Chuns Reef beach park. Severe traffic is already evident and extending it later will more costly than addressing the issue now.	This project is intended to address the pedestrian safety issues in the vicinity of Laniakea Beach.
Joe Wat	I just wanted to hop into the comments to say that Laniakea beach traffic has been a huge problem for my work. Coming from schools in Pūpūkea it has sometimes taken me an HOUR to get to Haleʻiwa with traffic starting at Foodland! This impacts how much work I can get done and costs me hours and hours of unpaid commute time and time with my family and friends. I am excited to see this project go forward and hope it makes Koʻolauloa a little more livable for residents. As part of this project, please budget for LARGE SIGNAGE describing the rules around turtles! While driving past I regularly see tourists harassing the turtles... if they will be funneled through a parking lot entry/exit,	There is ongoing coordination between DOT and other agencies regarding tourism and behaviors at Laniakea Beach. As other agencies proceed with developing beach support amenities or managing tourism, signage will need to be developed.

Commenter	Comment	Response
	more intentional pathways etc. please give them signage and more information around regulations!	
Kamehameha Schools, Todd Gray	Kamehameha Schools (“KS”) concurs with HDOT’s intent to re-prioritize pedestrian safety, while reaching a resolution that is sensitive to and accommodates all of the concerns in the area, including several cultural sites. With the above in mind, please find below a list of questions and concerns that KS would appreciate if you could address.	Thank you for your comment.
Kamehameha Schools, Todd Gray	Cultural Sites. The Project has the potential to impact a cluster of traditional Hawaiian archaeological sites located at the northeastern end of the Project, including ceremonial and burial sites. Among these sites is the Kahōkūwelowelo Heiau.	Your comment has been noted and has been addressed in Sections 3.3. and 3.4.
Kamehameha Schools, Todd Gray	The Cultural Impact Assessment (“CIA”) upon which the EA is based incorrectly indicates that I Nui Ke Aho is the primary steward of Kahōkūwelowelo Heiau. KS is and has been the primary active steward of Kahōkūwelowelo Heiau for over the last 10 years. KS coordinates and collaborates with numerous community groups and educational institutions in this regard. For instance, KS has developed educational programming at Kahōkūwelowelo Heiau with the University of Hawaii at Manoa and the KS Kapālama Campus. KS has an active land agreement with I Nui Ke Aho to ensure its members have regular access for cultural and educational use, and KS has hosted the Polynesian Voyaging Society to	The Final EA has been corrected with this information.

Commenter	Comment	Response
	engage in traditional and cultural practices at the site. KS has hosted numerous community meetings to develop restoration strategies for the site in partnership with the community and has recently begun native plant restoration at the site. Finally, KS has worked with KUPU and I Nui Ke Aho on mālama ʻāina projects at the site.	
Kamehameha Schools, Todd Gray	KS recommends that the EA/CIA be revised to reflect the accurate status of the stewardship of Kahōkūwelowelo Heiau as set forth above, and KS continues to recommend that these cultural sites be avoided and that appropriate site buffers be created to mitigate any direct and non-direct impacts to the site and associated cultural practices.	Your comments have been reflected in the Final EA/CIA.
Kamehameha Schools, Todd Gray	KS Lands. The EA indicates that 2 KS parcels are to be acquired by HDOT for the Project, including TMK Nos. 6-1-010:020 and 6-1-009:022; however, it is unclear whether the existing infrastructure and improvements (such as fencing and water lines) will be impacted. It is also unclear if existing agricultural tenants on these parcels will be displaced or if access to adjacent KS lands will be impacted. KS needs to be assured that it has access to its surrounding lands off Kamehameha Highway and that the agricultural uses of its longtime tenant, Kawailoa Ranch, will be adequately addressed. Any access, infrastructure, and/or improvements that are impacted by such condemnation should be relocated and/or replaced at the sole cost of HDOT. KS recommends that the EA	DOT has met with Kawailoa Ranch and adjusted the roadway alignment to accommodate the ranch. Any access, infrastructure, and/or improvements that are impacted by such condemnation will be relocated and/or replaced at the sole cost of DOT.

Commenter	Comment	Response
	be revised to provide more detailed information on impacts to KS lands and tenants and to ensure KS access to its lands, infrastructure, and improvements.	
Kamehameha Schools, Todd Gray	Ownership of Laniakea Beach. The EA asserts that KS is the owner of Laniakea Beach and, therefore, there is no City owned beach recreation area to support. This is incorrect. In the Second Amended Stipulated Judgment filed on May 14, 2000 in Civil No. 99-2561-07 (the "Condemnation Order"), the City condemned that portion of Laniakea Beach owned by KS, also identified as TMK No. 6-1-010: -17. The conveyance has not been completed yet due to delays encountered on the part of the City. As far as KS is aware, the City still intends for this portion of Laniakea Beach to be conveyed to it pursuant to the Condemnation Order, after which KS will no longer hold any fee title to Laniakea Beach. The EA should be revised to reflect the foregoing.	This has been correctly explained in the Final EA.
Kamehameha Schools, Todd Gray	Pedestrian Safety. The EA asserts that the Project would eliminate parking on the Mauka side of Kamehameha Highway, lessening the frequency of pedestrian highway crossing, but it is unclear whether there will be organized parking on the Makai side of Kamehameha Highway to ensure pedestrian safety and what steps will be taken to discourage or prohibit Mauka side parking. KS recommends that the EA be revised to further detail plans	The new parking area on the makai side of the highway would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. After construction of the realigned highway, there will be no parking area on the mauka side. No space will be provided. DPR and other agencies may decide to manage tourism at the site. There is ongoing coordination between DOT and other agencies

Commenter	Comment	Response
	for pedestrian safety on the Makai side of Kamehameha Highway.	regarding tourism and behaviors at Laniakea Beach.
Kamehameha Schools, Todd Gray	Residential Projects. On pages 2-2 and 3-12 of the EA, reference is made to three projects described in KS' North Shore Master Plan: Papailoa Residential Infill, Kapaeloa Residential Infill, and Kuikuiloloa Agricultural Area. The EA should clarify that KS is not actively pursuing any residential projects and that KS will seek community input before it considers pursuing such.	Thank you for the clarification.
Kamehameha Schools, Todd Gray	Miscellaneous. Table 3-2 on page 3-14 of the EA needs to be corrected. The reference to TMK No. 6-1-005:023 should be changed to TMK No. 6-1-005:026. Figure 2-11 on page 2-13 of the EA needs to be corrected. It incorrectly notes that KS is the owner of TMK No. 6-1-05-007. The reference should be to TMK No. 6-1-005:026	Thank you for the corrections.
Laura Figueira	As long time North Shore residents with a home approximately 5 miles north of the project site, my family and I have endured the interminable traffic congestion caused by pedestrian crossings at Laniakea for too many years. The only significant mitigation effort was SDOT's placement of parking barriers on the mauka side of the highway a few years ago. The relief was immediate but temporary, ended by a frivolous lawsuit led by a misguided attorney who audaciously called it a "quality	Thank you for your comment and analysis. The project represents a compromise for many competing users and interests. DOT has responded to community input that they also want parking to remain available when the project is complete. The lawsuit forced DOT to remove the barriers that, yes, had functioned well to limit traffic congestion.

Commenter	Comment	Response
	of life" issue. I am sure I speak for thousands of actual residents who have had to deal with the consequences of the court's ruling, particularly in the many hours spent on the Haleiwa By-Pass or Kamehameha Highway trying to get to "town" or home to their families. Whose quality of life was enhanced by restoring the free parking but the thousands of tourists who flock there to swim with the turtles, certainly not the taxpaying residents! Pedestrians are the very root of the congestion, therefore any proposal with crosswalks will not work! The proposed realignment of Kamehameha Highway, up to 80 feet mauka from its current location from the Haleiwa side of Lauhulu Stream Bridge to the Haleiwa side of Kawailoa Stream Bridge is the most practical and effective plan to be proposed in years. Blocking parking on the mauka side of Kamehameha Highway and creating a multiuse path where the existing highway is currently located makes absolute sense. Providing up to 90 parking spaces between the multiuse path and the new, realigned highway should satisfy even the most vocal critics of the relief provided by the concrete parking barriers years ago. Moreover, the proposed realignment would provide coastal erosion protection for the highway which is already badly undermined and would minimize flooding of the highway now occurring during high surf seasons. I would also like to express my gratitude to SDOT administration for its continuing effort to find a solution to this long-standing traffic problem, made more complex at times by mixed signals from the community such as the unfortunate lawsuit. I assure you it was not a	

Commenter	Comment	Response
	reflection of the sentiments of the vast majority of residents who are desperate for lasting relief from the traffic congestion. The SDOT's pedestrian shift alternative is the most promising solution in sight.	
North Shore Neighborhood Board #27	Board requests that their comments be incorporated into the final EA. The timing of the EA did not coincide with the July or September board meetings, but the board should not be penalized and it is only just over a week past the deadline for comments. The Board represents the community and must be heard as part of the process.	HDOT thanks the board for their input and has addressed your comments below.
North Shore Neighborhood Board #27	North Shore Neighborhood Board voted to support the pedestrian shift alternative	Thank you, support from the North Shore Neighborhood Board is noted.
North Shore Neighborhood Board #27	Who was consulted for cultural concerns: Bishop Museum? UH, Other entities? Road may infringe on these sites.	SHPD, KSBE, cultural practitioners and others were consulted for cultural concerns. Many alternatives were eliminated from consideration because of their impact on cultural and historic sites. Please see Section 2.5 for details.
North Shore Neighborhood Board #27	Need to stop the tourists – they are harming the endangered species in the area (specifically the turtles).	Regulating tourism is not part of DOT's mandate. No increase in visitation is expected because of the project. The State Department of Land & Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniakea.
North Shore Neighborhood Board #27	At one time these areas were not hardly used – now visitors have found these beaches. Hope current plans don't keep the area from its full potential.	Thank you for your comment. The preferred alternative does not preclude other agencies from making improvements within their own mandates.

Commenter	Comment	Response
North Shore Neighborhood Board #27	There will be a loss of parking and recreational use during construction. How can you accommodate and expedite the timeline, so people aren't kept away too long?	Access to parking will be available during construction as coordinated around the Contractor's work areas. -Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.
North Shore Neighborhood Board #27	Make sure you follow all the laws. Need to integrate environmental concerns into the Draft EA.	Yes, the Draft EA addresses environmental concerns and meets the requirements of Hawaii Revised Statutes Chapter 343.
North Shore Neighborhood Board #27	Many concerns regarding the thoroughness of the various studies for flora and fauna especially as it results in a finding of no significant impact in the area. Feels the studies are lacking. What are the social and environmental impact?	The Draft EA addresses the social and environmental impacts and concludes that there is no significant impact. For flora and fauna, please see Appendix E for details. Throughout the life of the project DOT has conducted multiple studies to assess the potential effects on the flora and fauna of the area. These studies are conducted by qualified personnel.
North Shore Neighborhood Board #27	Outreach on cultural concerns was not a robust process. Only 4 people consulted out of a community in the area of 4,000?	The project team reached out to many more people, but responses were only received from a small group and only four agreed to be formal consulting parties. Although the Draft EA only references four consulting parties in the Cultural Impact Assessment, many more discussions were held with other interested stakeholders, including Kamehameha Schools / Bishop Estate.
North Shore Neighborhood Board #27	Purpose and need of the EA are focusing on an unlawful need. EA did not point out alternatives like offsite parking. Who is parking? Mostly tourists.	Regulating tourism and parking for tourists is not part of DOT's mandate. DOT's mandate is to provide safe transportation infrastructure. The purpose and need of this project reflect this mandate.

Commenter	Comment	Response
North Shore Neighborhood Board #27	What is the main priority (we are all over the place): traffic, access to the beach, marine wildlife, parking? How many people are coming to this area? What about parking by tour busses? Where does the bike path go – not connected to anything.	It is clear in the Draft EA that DOT determined that the main priority for the proposed project is safety. DOT is going to leave half the existing road in place, and it will be available to be integrated into the overall bike plan for the North Shore.
North Shore Neighborhood Board #27	Moving the road mauka – removed this type of construct in the Sunset Beach area due to high water concerns so now we are doing something contradictory?	After ten years of consideration and discussion, moving Kamehameha Highway mauka has been determined to be the best alternative for this project location.
North Shore Neighborhood Board #27	Put the barriers back.	The DOT was sued for placing the barriers and made to remove them. Barriers, as part of the TSM Alternative, were evaluated in the Draft EA.
North Shore Neighborhood Board #27	Can we incorporate tours busses / vans in this plan?	DOT does not regulate tourism. DOT has asked the Hawaii Tourism Authority to limit buses/van drop offs at Laniakea Beach.
North Shore Neighborhood Board #27	Did we consult with the City and County in the EEA Prep? Is this burden being shifted to another entity instead of solving the issue?	Yes, DOT did consult with various departments of the City and County of Honolulu. DOT has funds for a highway project and hopes that other agencies will prioritize getting funding to make improvements within their own mandates.
North Shore Neighborhood Board #27	Bike path fits in with overall bike plan for the North Shore. Other parts of the path will eventually be built and connected. We will take the low hanging fruit to get it moving forward.	DOT is going to leave half the existing road in place, and it will be available to be integrated into the overall bike plan for the North Shore.
North Shore Neighborhood Board #27	There are a number of cultural sensitivities in the area that need to be addressed.	Please see the Sections 3.3 and 3.4 of the Draft EA. Many alternatives were eliminated from consideration because of their impact on cultural and historic sites. The preferred alternative was designed with these sensitivities in mind.
North Shore Neighborhood Board #27	Yes, this is not the best answer, but it is a compromise.	DOT recognizes that no alternative pleases everyone so, yes, this is a compromise that meets

Commenter	Comment	Response
		the purpose and need as well as the regulatory requirements.
North Shore Neighborhood Board #27	There were lots of community meetings over the past 20+ years. The North Shore NB discussed this issue at every Transportation Committee meeting.	Agreed, there have been many meetings. DOT appreciates the years of thoughtful discussion and feedback.
North Shore Neighborhood Board #27	Need alternatives for the tour busses to see turtles: Sea Life Park, the aquarium, etc.	DOT does not regulate tourism or control activities for visitors.
North Shore Neighborhood Board #27	There is spill over into Puaena Point which is even more sacred than Laniakea.	Thank you for your observation.
North Shore Neighborhood Board #27	Need something done – this will only push the issue down the road – Chun's Reef will be the next bottleneck area.	This project is intended to address the pedestrian safety issues in the vicinity of Laniakea Beach.
North Shore Neighborhood Board #27	What are the dimensions of the revetment and other features (bike path, roadway)?	No revetment is planned as part of the project. As described in Section 5.5.2., this alternative was considered but rejected. The shared use path will be one-half of the existing 28-foot roadway, nominally 14-feet. The planned road for the Pedestrian Shift Alternative has two 12-foot-wide lanes, a 10-foot-wide refuge lane, and shoulders for a total of a 44-foot-wide footprint.
North Shore Neighborhood Board #27	How does the parking work? Will it be directed?	The parking will not be directed. There will now be a refuge lane so traffic will be less impacted as vehicles access the informal parking area.
North Shore Neighborhood Board #27	Community must have access during construction.	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and

Commenter	Comment	Response
		accessible to the public throughout the duration of construction.
North Shore Neighborhood Board #27	Can the work be done at night?	Construction is anticipated to occur primarily during the daytime hours. There is the potential for a small period of time that some of the construction will be done during night hours because of traffic concerns. Lighting during nighttime work hours will be shielded and appropriately installed; please see Section 3.16.5 for details. The Contractor will have to obtain a Community Noise Variance which will limit the use of various types of equipment to restricted hours.
North Shore Neighborhood Board #27	What are the improvements you mention with streetlights, drainage, cross street and driveway modifications? What does all of this mean?	In order to access the realigned Kamehameha Highway, some of the existing driveways will need to be adjusted. New streetlights will be installed along the realigned highway and new stormwater drainage facilities will be provided.
North Shore Neighborhood Board #27	This area is highly utilized by the community and visitors.	Yes, the project team agrees that it is a very popular place for both tourists and the community. Our Traffic Evaluation supports this observation; please see Appendix B.

Commenter	Comment	Response
North Shore Neighborhood Board #27	City and County Parking will be for the community (the interim settlement plan).	When the No Build Settlement Alternative is implemented by the City and County of Honolulu Department of Parks and Recreation (DPR), the approximately 60-foot wide by 280-foot-long informal parking area will remain undeveloped as it currently exists. The proposed Pedestrian Shift Alternative will create a similar informal parking area that will measure approximately 60-feet wide by 400-feet long. DOT will replace the parking situation as it exists. Agencies that are responsible for developing shoreline recreation facilities may use this dirt area to create a formal parking lot in the future. During construction will be limited for public safety around construction zones and equipment. DOT cannot discriminate between resident and visitor parking.
North Shore Neighborhood Board #27	Original proposals moved the road even further inland that would have affected cultural areas. DOT avoided cultural sites with this effort.	Many of the alternatives described in Section 2.5 would have had greater impacts on cultural areas. The preferred alternative as proposed has minimized impacts to cultural sites.
North Shore Neighborhood Board #27	Work at night will disturb residents and turtles.	Construction is anticipated to occur primarily during the daytime hours. There is the potential for a small period of time that some of the construction will be done during night hours because of traffic concerns. Lighting during nighttime work hours will be shielded and appropriately installed; please see Section 3.16.5 for details. The Contractor will have to obtain a Community Noise Variance which will limit the use of various types of equipment to restricted hours.

Commenter	Comment	Response
North Shore Neighborhood Board #27	If you use Federal money, it is very likely the Federal government will not allow this project to move forward.	Previous project development efforts in the area intended to use federal funds for construction. Using only state funds allows the project to be implemented more quickly.
North Shore Neighborhood Board #27	Concern for consulting was in relation to the cultural aspects of the project – DOT has a history of destroying cultural sites when building roads. Will a cultural monitor be involved? Has the State Historic Preservation Dept been involved?	DOT has committed to archaeological monitoring and will have a SHPD-approved Archaeological Monitoring Plan in place prior to any construction activities.
North Shore Neighborhood Board #27	Draft EA states that the Waialua Hawaiian Civic Club was consulted but I never saw anything.	DOT sent letters and emails between January 26 and February 3, 2021.
North Shore Neighborhood Board #27	What are the 6E requirements? Make sure all laws are being followed especially related to the cultural aspects of this project.	The project is required to comply with Hawaii Revised Statutes Chapter 6E-8. DOT has been in coordination with the Department of Land and Natural Resources State Historic Preservation Division to determine the adequate level of study appropriate for the project. Prior to any construction initiation, SHPD will have had an opportunity to review the proposed project's effects on historic properties.
North Shore Neighborhood Board #27	There are big waves and storm surges in the area, this is a big safety concern.	DOT is mindful of the fact that there are large waves and storm surges that have resulted in the closure of Kamehameha Highway. The project is intended to address the resiliency of the highway in this area by moving it mauka.
North Shore Neighborhood Board #27	Bike path will be gone by the time connections are built.	The DOT intends to provide a safe and reliable transportation network for all users. While these connections may not be constructed in the near future, the path that will be created from the existing highway will be available for use.

Commenter	Comment	Response
North Shore Neighborhood Board #27	Can't guarantee residents only parking	DOT cannot discriminate between resident and visitor parking in the informal parking area. The parking area at Laniakea Beach may be modified in the future by the appropriate City or State agency and preferential treatment for residents may be developed similar to Hanauma Bay. However, this is beyond DOT's mandate.
North Shore Neighborhood Board #27	Need enforcement of the laws in the area.	Yes, it is hard to regulate illegal activities if there is not enforcement.
North Shore Neighborhood Board #27	People crossing the road are not breaking the law if there is no crosswalk.	Pedestrians crossing the street may not be breaking the law but there is a safety issue.
North Shore Neighborhood Board #27	Likes the idea of construction at night otherwise there will be 18 months of hell for the community in driving through the area.	Construction is anticipated to occur primarily during the daytime hours for the segments that can be constructed independently of the use of the existing Kamehameha Highway. There is the potential for a small period of time that some of the construction will be done during night hours because of traffic concerns.
North Shore Neighborhood Board #27	What is legal or not legal does not matter if there is no enforcement.	Yes, it is hard to regulate illegal activities if there is no enforcement.
North Shore Neighborhood Board #27	We need to look purposefully at moving people around the North Shore: shuttles for example.	DOT does not regulate tourism but the agencies that are involved with tourism could look into innovative ways of moving people around the North Shore.
North Shore Neighborhood Board #27	The road will be washed out no matter what we do – it gets washed out now.	This project as designed is intended to provide another 30-50 years of useful life given sea level rise projections. DOT recognizes that disasters like hurricanes and tsunami can wash out highways, particularly in coastal areas.

Commenter	Comment	Response
North Shore Neighborhood Board #27	DOT did a good job with the various realignments and bridges along Kamehameha Hwy from Sunset over to Punaluu. Please apply this same effort and level of work to the Laniakea area project.	Thank you for your comment and compliment.
North Shore Neighborhood Board #27	NOAA has been on the sidelines and HTA has promoted the beach as a turtle viewing spot.	Involvement by NOAA and HTA would be appropriate as DOT does not regulate tourism or turtle viewing.
North Shore Neighborhood Board #27	Fine with closing the area for the project duration. Consider a viewing platform for visitors – it will be boring, and they will go elsewhere.	DOT does not provide tourism facilities, but a viewing platform could be considered by other agencies.
North Shore Neighborhood Board #27	Need to amend the EA to include mechanisms for discouraging turtle viewing.	DOT does not regulate tourism or turtle viewing.
North Shore Neighborhood Board #27	FONSI is the wrong determination based on factors that are missing from the EA.	The Final EA documents fulfill the requirements of Hawaii Revised Statutes Chapter 343 and Hawaii Administrative Rules 11-200.1. The impacts have not breached the thresholds established by the significance criteria in HAR 11-200.1-13 and therefore a Finding of No Significant Impact is the correct determination. The project as proposed is the result of compromise that has evaluated the various resources in the area and agency policies. This project also has considered public policy and the opinions of multiple users.
North Shore Neighborhood Board #27	Who manages the turtles? This is not a task for DOT.	DOT does not regulate tourism or turtle viewing. The United States Fish and Wildlife Service, Department of Land and Natural Resources and National Oceanic and Atmospheric Administration all have a role in protecting turtles.

Commenter	Comment	Response
North Shore Neighborhood Board #27	Lights are required for night work and could negatively impact the turtles.	Construction is anticipated to occur primarily during the daytime hours for the segments that can be constructed independently of the use of the existing Kamehameha Highway. There is the potential for a small period of time that some of the construction will be done during night hours because of traffic concerns. There will be controls on lighting as described in Section 3.16.5 and these will be included in the construction documents.

Commenter	Comment	Responses
Patrick and Mahea Holtzman	We support the Pedestrian Shift Alternative. To all the benefits of this alternative that DOT outlined, we would like to add one more. The current problems at Laniakea seem to be bigger than we can handle. Most of the information on the internet about this beach is written by one-time visitors: for example, reviews on Google Maps, Yelp, Trip Advisor, and articles posted by countless travel bloggers in many languages. What they have posted in the past such as, "I swam with a turtle!" and "You must go to Laniakea!" will never be voluntarily updated. Whatever all of us do, including the State, City, NOAA, HTA, elected officials, residents, activists, volunteers, and the media, may never be enough to reverse that course. Closing the parking of Laniakea for the duration of the construction may be the only way to reset and reintroduce Laniakea to the world. When construction is over, a portion of the old mauka lane (new pedestrian lane) may be turned into a turtle viewing platform with signs asking visitors not to go down to the beach to view turtles. Since the beach is small, the visitors should be able to see turtles clearly. Yet, hopefully, many tourists will decide it's not worth driving to Laniakea if they can't take selfies with turtles or swim with them. Surfers and other ocean users should be allowed to walk straight out to the sea, perhaps using a designated path. We fear that unless we find a way to reduce the number of turtle tourists, no amount of parking spaces will be enough, and the chaos will continue. A viewing platform is an effective way to prevent marine wildlife harassment from happening, already proven in California.	Thank you for your comment. DPR and other agencies may decide to manage tourism at the site. There is ongoing coordination between DOT and other agencies regarding tourism and behaviors at Laniakea Beach. As other agencies proceed with developing beach support amenities or managing tourism, a viewing platform is a good suggestion for consideration.

Commenter	Comment	Responses
Rachel Hill-Achiu	Support replacing the barriers and not wasting any more money on any other alternative. The barriers have been proven to work and are the most cost and time effective solution on hand. Laniakea used to have significant Naupaka and Iron Wood lining the road, blocking the view, limiting access, and preventing erosion.Not long ago, parking was prohibited on the makai side of Sunset Beach due to erosion, yet the opposite is being done in Laniakea and parking will be provided. Once parking is established, it will be utilized despite unsafe conditions. Also, it would be irresponsible to not acknowledge the significant cultural impacts to various sites in the immediate area should the preferred alternative move forward.	Thank you for your comment. The project has coordinated with the State of Hawaii Department of Land and Natural Resources State Historic Preservation Division, Kamehameha Schools / Bishop Estate, and the Office of Hawaiian Affairs and other knowledgeable individuals to understand the project's impacts on cultural and archaeological resources. The preferred alternative represents a solution that is sensitive to the area.
Sandra Cashman	No Build alternative: it doesn't address the traffic issue. It only applies to shoreline erosion. No Build Settlement alternative: this seems like a good interim measure, not a replacement for a more permanent solution, but a feasible mitigation effort that could be accomplished quickly. The Transportation System management alternative: this sounds like the barrier system tried previously which did alleviate the traffic (At that time the Tourist Association also agreed to stop tour busses and vans from stopping at Laniakea, so that added to the impact). Would this be subject to lawsuits? This plan lacks the crosswalks which seem like a good safety feature in the No Build Settlement alternative. Realignment alternative: this is of course the preferred	Thank you for your comments on each of the alternatives. Your preference for the realignment alternative is noted. The timeline is less than 15 years; it should be fully constructed by 2025. Yes, the TSM is similar to the barriers and could face lawsuits. As you have suggested, the No Build Settlement Alternative is currently being implemented while the Pedestrian Shift Alternative is being designed and constructed.

Commenter	Comment	Responses
	solution but has been given a timeline of 15 years. Residents of the North Shore have been promised a realignment solution over and over again in community meetings and it's always a sliding ten years in the future. So if this is the solution chosen, it needs to be paired with one of the other alternatives (No Build settlement or Transportation System management) to be at all meaningful.	
Sara Ackerman	For the Laniakea plan, I strongly support the pedestrian shift option. I was born and raised in Hawaii, taught at Kahuku high for many years and have seen the sad transformation of the north shore, most especially at Laniakea beach. Just today when I passed, there was some guy in a U-Haul who had set up a little stand to sell pineapples that it looked like he bought at Costco, and tourists swarming. I also suggest that the beach be closed to tourists/turtle harassers during construction to give the turtles a rest. As well as the residents of the north shore, who have for almost 20 years endured gridlock traffic so tourists can cross the road and harass turtles. Any plan that doesn't take this into account, and still allows for the tourists to cross the road is a waste of time and money. PLEASE MAKE THE RIGHT DECISION!	Your comment is noted. Because many in the community feel parking for the beach must always be available, beach access will be maintained. DOT's mandate does not include managing parking and tourism, but the project is intended to address your concern regarding gridlock in the area.

Commenter	Comment	Responses
Stanford Brown	As a businessman and North Shore resident, I support the Kamehameha Highway Pedestrian Safety Project, and as a taxpayer, I suggest the additional measure of charging a minimum of one dollar per vehicle for parking in the new parking lot. I am grateful for the steps being taken to prepare for the future and mitigate traffic and pedestrian death, along with the environmentally and culturally responsible construction practices. Hawaii's natural beauty holds both intrinsic and economic value, and it makes sense that the cost of this project and/or further restoration and preservation of the area be supported by those tourists who frequent this popular tourist destination given limited budgets. We should be encouraging visitors to invest in its preservation for years to come, including, if possible, planning for the entire 6 feet of conservatively predicted sea level rise by the end of the century. Such measures have been successful in other locations like the Pali lookout.	The project's design is intended to accommodate the Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism through parking fees.
William W. Saunders Jr.	Fully supports the stated purpose of the project and the Pedestrian Shift Alternative. However, my concern is that it will be reviewed, planned, and constructed consistent with public safety and Hawaii's CZM Act, HRS Chapter 205A, especially as they relate to access to coastal rec. resources. It appears to be a multi-year project with an unpredictable timeline. The Ped Shift alternative calls for the complete closure and elimination of parking Mauka of Laniakea beach for an indefinite period of time. I believe this would be contrary to both the letter and spirit of HRS Ch 205A and would create unsafe pedestrian and vehicle conditions during construction.	The project as proposed is consistent with Hawaii's CZM Act, HRS Chapter 205A, as noted in Section 3.17 of the document. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.

Commenter	Comment	Responses
	The project must include mitigation measures to address both of these impacts during construction and the FEA be expanded to consider such mitigation. It must also clearly discuss and commit to providing adequate replacement parking and coastal access opportunities upon completion of construction. While the project goal is to enhance pedestrian safety, I am concerned that even more dangerous conditions will be created if, even if temporarily during construction, the existing parking is eliminated. With no alternative provided, beach users will be forced to park along the shoulder, legally or illegally, to reach Laniakea. Elimination or reduction of beach access parking at Laniakea in the name of pedestrian safety will relocate the danger and increase it in adjacent areas. The safest alternative would be to preserve existing or increase parking during construction. When parking was eliminated by the barricades which were in place between December 2013 and August 2015, pedestrians were forced to navigate along the narrow highway shoulder for long distances pushing strollers, rolling wheelchairs, and carrying surfboards, kayaks, and SUP and windsurfing boards and equipment. In addition, people who parked along the mauka shoulder continued to haphazardly cross the highway to reach the beach. With shoulder parking stretching out several hundred yards on either side of the beach, the crossing danger was also more spread out and unpredictable to motorists. On October 27, 2014, with the barriers in place, a serious auto/pedestrian accident occurred on the makai side of the roadway in the vicinity of the park wherein a motorist	

Commenter	Comment	Responses
	struck three pedestrians who were apparently attempting to access the Laniakea Beach while walking along Kamehameha Highway. I am attaching some photos to demonstrate this dangerous situation. The DEA is brief and misleading in regard to the impact of the project on parking and coastal access: "Although the informal parking on City property would be blocked during construction, the impact is temporary, and not a full restriction. Beachgoers can still use alternative modes of transportation (bus, bicycle, walk) or park at a different location" The nearest parking available is to the East of Chuns Reef, limited and dangerous. It gets worse towards Waimea Bay. Parking toward Ka`ena Pt and Haleiwa Beach Park is too far to be feasible. Suggesting the use of bus or bicycle transportation to Laniakea is disingenuous and ignores the items patrons will be traveling with (SUP, surfboard, kayak). It will be exposing beach goers, and their children, to dangers of walking on a narrow shoulder. In this regard, the HDOT proposal and the analysis of these issues in the Draft EA totally fail to satisfy its obligations to: “Provide coastal recreational opportunities accessible to the public,” “Protect beaches for public use and recreation,” “Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area,” “Provide[e] and manage[e] adequate public access . . . to and along shorelines with recreational value.”	

Commenter	Comment	Responses
	In order to comply with the CZMA objectives, policies, and guidelines, the alternatives considered and chosen by HDOT must: 1. Preserve and enhance public parking and access to the coast, both during construction and as finally built, and 2. Preserve and enhancing the public's ability (again, both during construction and as finally built) to use and enjoy Laniakea Beach Support Park, the land for which the Hawaii First Circuit Court awarded to the City on August 2, 1999, as part of a series of condemnation actions intended to create and improve much needed public parks on the North Shore. DOT has not discussed or even considered, mitigating its adverse construction impacts on the Park parcel and the recreational resources it provides access to. The summary provided on Table ES at page S-4 of the Draft EA, under "Mitigation/ Minimization/Avoidance Measures" simply states "None proposed." At Section 3.7, beginning on page 3-27, there is no discussion whatsoever addressing the years-long loss of a very heavily used resource that is essential for coastal recreational access in the area. This is despite the fact that this issue was specifically raised in several of the scoping comments included in Appendix A-1. Even the North Shore Chamber of Commerce was unanimous that "long period or periods of time with no parking at Laniakea just will not work" and asked HDOT to find a way to make alternative parking available. If HDOT and its contractors cannot phase this project in a way that unequivocally preserves adequate public parking on the City Park parcel during construction, they need to find an alternative location for coastal access parking in the	

Commenter	Comment	Responses
	immediate vicinity. KSBE has a considerable amount of land mauka of the highway and one or more temporary parking lots could be set up on that existing, mostly flat and clear acreage. Acquisition of temporary construction (or even permanent) easements for that purpose can be included in the ROW condemnation proceedings that HDOT must undertake for any bypass. The current parking on the Park parcel takes up less than an acre. A convenient parking lot that accommodates 55-60 vehicles or more could easily be located somewhere on KSBE's adjacent parcel, TMK# 6-1-005-023, on a temporary basis for minimal cost considering the overall project budget.	
William W. Saunders Jr.	HDOT has not discussed or even considered, mitigating its adverse construction impacts on the Park parcel and the recreational resources it provides access to. The summary provided on Table ES at page S-4 of the Draft EA, under Mitigation/Minimization/Avoidance Measures" simply states "None proposed." At Section 3.7, beginning on page 3-27, there is no discussion whatsoever addressing the years-long loss of a very heavily used resource that is ***essential*** for coastal recreational access in the area. This is despite the fact that this issue was specifically raised in several of the scoping comments included in Appendix A-1. Even the North Shore Chamber of Commerce was unanimous that "long period or periods of time with no parking at Laniakea just will not work" and asked HDOT to find a way to make alternative parking available. If HDOT and its contractors cannot phase this project in a way that unequivocally preserves adequate public	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction. KSBE's property mauka of the highway is an active ranch. The project has coordinated with the ranch to minimize impacts to their operations.

Commenter	Comment	Responses
	parking on the City Park parcel during construction, they need to find an alternative location for coastal access parking in the immediate vicinity. KSBE has a considerable amount of land mauka of the highway and one or more temporary parking lots could be set up on that existing, mostly flat and clear acreage. Acquisition of temporary construction (or even permanent) easements for that purpose can be included in the ROW condemnation proceedings that HDOT must undertake for any bypass. The current parking on the Park parcel takes up less than an acre. A convenient parking lot that accommodates 55-60 vehicles or more could easily be located somewhere on KSBE's adjacent parcel, TMK# 6-1-005-023, on a temporary basis for minimal cost considering the overall project budget.	
William W. Saunders Jr.	HDOT is duty-bound to make every reasonable effort to come up with a solution that does not hinder or diminish the public's ability to safely enjoy recreational opportunities at Laniakea. The Final EA will be inadequate if it does not squarely deal with this.	The Final EA document fulfills the requirements of Hawaii Revised Statutes Chapter 343 and Hawaii Administrative Rules 11-200.1. The impacts have not breached the thresholds established by the significance criteria in HAR 11-200.1-13. The project as proposed is the result of compromise that has evaluated the various resources in the area and agency policies. This project also has considered public policy and the opinions of multiple users.

Commenter	Comment	Responses
William W. Saunders Jr.	In order to comply with the mandates of the CZMA, the finished project, whatever form it takes, must permanently restore, if not increase and enhance, the existing level of parking. Some of the alternatives vaguely discuss "informal parking" as part of the finished project. Page 2-6 of the EA, discussing the Pedestrian Shift Alternative, states that “the makai side of the realigned Highway could accommodate parking with an estimated capacity of 90 cars in the 60-foot-wide by 400-foot-long space.” However, there is no detailed rendering or analysis of whether this is really possible. The low-resolution drawings that are included (Fig. 2-7) seem to show in red less parking area available than on the diagram attached to Mr. Bill Quinlan’s February 17, 2021 comment email (at Appendix A-1) which appears to extend further and shows only 50 spaces. I am concerned that the reference to "informal parking" seems more like token parking which will be inadequate to replace what will be eliminated by the project. The Final EA should provide sufficient information, detail, and measurements to demonstrate that at least the existing 50 to 60 parking spaces can be restored makai of the shifted highway. Otherwise, HDOT must consider permanent, as well as temporary, condemnation of sufficient land for replaced/enhanced parking on adjacent parcels. As noted above, there is ample space readily available on the adjacent parcel, TMK# 6-1-005-023.	Based on comments made by the City and County of Honolulu Department of Planning and Permitting (DPP) in permit coordination meetings, motorized vehicle parking makai of the certified shoreline in this area is detrimental to coastal resources. The parking that occurs in this area should not be automatically construed as consistent with the Coastal Zone Management Act. The project's Traffic Evaluation (Appendix B) documents that the current informal parking area accommodates roughly 50 motorized vehicles. The No Build Settlement Alternative, implemented by the City and County of Honolulu Department of Parks and Recreation (DPR), provides an approximately 60-foot wide by 280-foot long, informal parking area that accommodates a similar number of cars. The proposed Pedestrian Shift Alternative estimates that a similarly undeveloped area that is of equal size or larger will be informally available and will be able to accommodate roughly the same number of vehicles to the No Build and No Build Settlement Agreement. HDOT has disclosed these impacts, and compliance with the CZMA and HRS 343 do not require betterments or enhancements to the level of parking. Agencies that are responsible for developing shoreline recreation facilities may use this dirt area to create a formal parking lot in the future.

Commenter	Comment	Responses
University of Hawaii (UH), at Manoa, William S. Richardson School of Law	We appreciate your efforts to propose a project that focuses on a safer pedestrian environment at Laniakea Beach, while also protecting the natural and cultural environment. The multitude of problems in this sensitive area have become increasingly evident and worsened, despite years of community concern and prior stop-start efforts by DOT to address these issues and consider highway realignment options. Due primarily to the overly narrow scope of the DOT's "purpose and need," however, we conclude that this DEA does not fulfill the core purposes of HRS § 343-1, to "integrate the review of environmental concerns with existing planning processes of the State and counties," "to alert decision makers to significant environmental effects which may result from the implementation of certain actions," to encourage "cooperation and coordination," and to "benefit[] all parties involved and society as a whole" through robust "public participation during the review process."	The primary claim in your comment is that DOT's "purpose and need" is too narrow and therefore does not meet Chapter 343 of the Hawaii Revised Statutes' (HRS 343) purpose based on what appears to be the presumption of a lack of a robust public participation process. While we agree on certain aspects of your comment's characterization of the HRS 343 process, we want to first provide some clarification as your comment not only misconstrues HRS 343's stated values as its purpose, but also misinterprets the law's key findings by removing them from the statute's context. In context, HRS 343-1 states, "*The legislature finds that the quality of humanity's environment is critical to humanity's well-being, that humanity's activities have broad and profound effects upon the interrelations of all components of the environment, and that an environmental review process will integrate the review of environmental concerns with existing planning processes of the State and counties and alert decision makers to significant environmental effects which may result from the implementation of certain actions. The legislature further finds that the process of reviewing environmental effects is desirable because environmental consciousness is enhanced, cooperation and coordination are encouraged, and public participation during the review process benefits all parties involved and society as a whole*." Practitioners view the first part of this statement as a value on disclosure and the second part of the statement as the statute's value on

Commenter	Comment	Responses
		process, both of which are reflected in the Hawaii Administrative Rules 11-200.1. The actual stated purpose of HRS 343 is "*to establish a system of environmental review which will ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations*" (HRS 343-1). The distinction is important because the statute's end goal is balanced decision making by the agency. DOT, as the proposing agency/agency with jurisdiction over transportation has fully complied and fulfilled its obligations in accordance with the stated values (disclosure and participation) and purpose (balanced decision making) of this statute. The Kamehameha Highway Pedestrian Safety Project Draft EA documents DOT's disclosure of the environmental concerns on balance with the economic and technical considerations associated with DOT's proposal. DOT's proposal and consideration of impacts was undertaken with a robust public participation and agency coordination process. As described in Section 1.1 of the Draft EA, the Draft EA did not detail all prior planning for the project because it spanned over a decade. In developing the document, providing a clear and concise disclosure of the anticipated impacts associated with DOT's proposal outweighed the need to provide public outreach details that occurred prior to the formal scoping process for the Draft EA. Section 1.1 of the Draft EA

Commenter	Comment	Responses
		acknowledges this and explains that although these communications are not detailed, the solutions presented are a culmination of consultation and participation between landowners, residents, and agencies with jurisdiction who are most affected by the project over the last decade when DOT began working on a solution in 2011 From the project's initiation, DOT has met each of the tenets of Chapter 343 and HAR 11-200.1 in its decision-making, even in the face of alternate community perspectives. When DOT's initial efforts to prove itself as being a genuine partner with the community by placing barriers along the Highway resulted in litigation, it became evident that community goals were so diverse that general public meetings would not help DOT arrive at a community-accepted solution. In lieu of large public meetings, DOT persisted to engage the community and agencies at the local level - sitting face to face with ranchers to hear their concerns, visiting sacred sites with their caretakers to become educated on their importance, meeting in small groups with property owners that border the project area, as well as meetings with agencies with jurisdiction over resources in the project area. Meetings with each entity occurred not just once, but several times over the life of the planning phase in order to present the decision-point and gain informed input. The result is a solution that community members are willing to accept as a

Commenter	Comment	Responses
		compromise, which is evidenced in the comments received on the Draft EA. In regard to the aspect of the comment that failure to adhere to these principals resulted in an overly narrow scope in DOT's purpose and need, the project's purpose and need is adequately scoped and appropriately limited to DOT's jurisdiction of transportation. Given that an EA is an agency decision-making document, DOT cannot commit other agencies to decisions to improve or mitigate. Each agency has differing priorities, capacities, and funding within their jurisdiction. Early feedback from the City was that there has been no funding to carry out their development of the Laniakea Beach and Chun's Reef Beach support parks, which went through the HRS 343 process in the 2000s. Recognizing this, HDOT has coordinated and made reasonable accommodations based on that coordination for those agencies and their respective jurisdictions within the proposed solution.
UH Manoa William S. Richardson School of Law	The three main areas of concern as indicated below are: (A) “purpose and need” is too narrowly defined, (B) “significance” is under-estimated in several key areas, and (C) the alternatives examined are insufficient in scope and detail. Given these concerns, we recommend either that a revised DEA be prepared for another round of agency and public comment or that, due to the likely significance of the effects, an Environmental Impact Statement Preparation Notice (“EISPN”) be commenced.	The three main areas of concern presented in this comment is a summary of the comments made by the students. Each of these individual comments follow in the letter and have been addressed separately. Upon evaluation of comments received during the Draft EA comment period, DOT stands by its Anticipated Finding of No Significant Impact. The proposed project does not exceed the significance thresholds established in HAR 11 § 11-200.1-13.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	C. Alternatives The limited purpose and need has in turn limited the range of reasonable alternatives considered in the DEA. Additional reasonable alternatives that would address the root causes of the traffic and pedestrian congestion – and reduce it rather than increase visitors to the area - should have been considered. Some of these alternative ideas that should be explored, in light of a broader understanding of purpose and need, and inviting coordinated agency-civic action and engagement, include the following five alternatives:	All five alternatives presented share tourism as a main focus. Note that historically, use of Laniakea Beach has increased while access has not changed. Its use will continue to grow regardless of whether DOT implements the proposed project. This is because use of the beach is driven by Oahu's population growth and the number of tourist visitors to Oahu. Managing population growth and tourism is not within DOT's jurisdiction. DOT seeks to provide safe and reliable highway infrastructure for all users. The proposed design was developed through a robust agency, and stakeholder coordination process. It accommodates the City and County Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. The alternatives presented must meet the Purpose and Need of the Kamehameha Highway Pedestrian Safety Project. The primary purpose of this project is to improve safety for pedestrians and all modes of transportation at the section of Kamehameha Highway fronting Laniakea Beach. Secondary to pedestrian safety, the project is being proposed to: •Improve Reliability. Reduce the Highway's vulnerability to climate change, wave inundation, and coastal erosion that threatens its ability to operate, •Relieve Congestion. Relieve congestion by reducing travel times throughout the project area, and

Commenter	Comment	Responses
		•Pedestrian and Bicycle Facilities. Support alternative transportation modes as identified in regional community and transportation plans.
UH Manoa William S. Richardson School of Law	Alternative 1. Reduced and Managed Tourism Alternative. The highway would be realigned mauka like the Pedestrian Shift Alternative (PSA) but with a makai "passive park" in the area of the existing highway and no parking would be allowed on the makai side of the highway (except for emergency responders, lifeguards, and law enforcement). All parking for tourists would be off-site (e.g., Meadow Gold or Haleiwa or Waimea Valley) and be fee-based; tourists could access the beach area only via a reserved shuttle (fee-based, operated by a community non-profit) with narrated tour and "pono practices" information to protect cultural practices and wildlife. Hawaiʻi residents only would be allowed to park only along the makai Highway on either side of Laniākea and would walk to the beach. Appropriate signage would restrict parking to Hawaiʻi residents only. Close the beach before sunrise and after sunset to non-residents (resident access only). Install permanent educational signs on the shoreline and beach. Implement a social media campaign that discourages cheap tourism, exposes bad behavior (e.g., wildlife harassment), and encourages ethical "regenerative" tourism. Install web cams to document misconduct and support law enforcement. This alternative would enhance the scenic beauty, prevent further shoreline erosion, allow natural retreat of the shoreline, support resident and cultural access, and reduce the overwhelming volume of tourists and their impacts.	The Reduced and Managed Tourism Alternative relies on a design that is similar and already captured by the Pedestrian Shift Alternative. The parking and resource management elements that differentiate this Alternative from the Pedestrian Shift Alternative are outside of DOT's mandate and expertise. The Pedestrian Shift Alternative does not preclude the City and County of Honolulu or the Department of Land and Natural Resources, who manage tourism and beach park resources, from pursuing these strategies.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Alternative 2. Elevated Highway Segment. Instead of moving the highway mauka, elevate the 1000-foot segment by 10-20 feet to allow for natural erosion of the shoreline, protect the floodplain, streams/wetlands, enhance scenic drive-by views, and limit visitors to the site. This could set a valuable precedent for elevating other highway segments in Hawaiʻi that are inevitably at risk from sea level rise and coastal erosion. Allow parking only along the makai side of the highway at either end of the elevated segment for residents only. For tourists, institute the shuttle system and restrictions described in Alt 1. above.	Elevating the Highway would meet the Purpose and Need for pedestrian safety and reducing congestion. However, elevating the Highway on piers for this segment is not constructible given the driveway accesses, slopes and line-of-sight distances that would need to be achieved to meet the new elevated section of the Highway. In terms of impacts, the new structure would have a severe impact on Kahokuwelowelo and, as the structural supports would create more ground disturbance, the chances of disturbing iwi kupuna increases. Other impacts of this alternative would include changing the rural character of the Highway and the visual landscape, which are important for consistency with the North Shore Sustainable Communities Plan and the Coastal Zone Management Policies. Additionally, this alternative poses detrimental impacts, such as flooding on adjacent landowners, which violates the requirements set by the National Flood Insurance Program (NFIP). The remaining suggested actions to manage beach park resources, as well as tourism and visitors to Laniakea Beach all fall outside DOT's mandate as mentioned in the response to Alternative 1.
UH Manoa William S. Richardson School of Law	Alternative 3. Pedestrian-Bike Overpass. Build a pedestrian- and bike-only overpass (similar to the ones over the H-1 Freeway in town) with mauka parking in the city-owned lot for residents and the tourist shuttle (see 1. Above), add solid guard rails and fencing along the highway to prevent pedestrian crossings at grade. The added benefit of an overpass could be educational signage, viewpoints, and a fee could be instituted for	Building a Pedestrian-Bike overpass would address pedestrian safety, congestion and pedestrian and bicycle facilities. However, the alternative would not increase the resilience and reliability of the Highway. Therefore, it would not meet the project's Purpose and Need.

Commenter	Comment	Responses
	tourists (to be used for staffing and marine life conservation on site) during peak times with an ambassador posted at both ends of the overpass and educational kiosks. This creates “management points” for access, enhances safety, relieves congestion, and protects the natural and cultural resources without a costly realignment.	
UH Manoa William S. Richardson School of Law	Alternative 4. Multi-Agency Alternative. Engage all federal, state, and county agency partners in a cooperative approach that seeks to solve more than just the pedestrian/traffic issues. Include the Hawaiian Civic Clubs and the ‘Ahu Kiole (People’s Council) for O‘ahu; use the Aha Moku Framework for Collaborative Management. Designate Laniākea as joint protected area of state-wide significance based on its unique cultural, recreational, and wildlife values. Utilize the City beach park land that is “banked” in this area for parking and strict tourism management (e.g., limited tourist shuttles from Haleiwa and reservation-only commercial island tour stops, like Ha‘ena). Ensure on-site active mangement by DLNR and NOAA for wildlife protection. Provide restrooms at the city parks but farther away from beach itself. Charge fees to visitors through a joint education center like Hanauma Bay and offer limited reserved guided tours of the coastline and expert Honu observation. Do not allow unmanaged access by tourists. At the education center, use pictures and murals of people modeling positive behavior, showing respect for and keeping distance from the turtles, people keeping within walking path, replanting native plants, picking up litter or placing litter in proper receptacles, and people taking the information they learned to educate those at	The Multi-Agency Alternative is well outside of DOT's mandate to provide and maintain transportation infrastructure. It should be noted that Hawaiian Civic Clubs, DLNR, and NOAA were all consulted, as suggested by the comment. This Alternative proposes constructing park facilities with parking, shuttle drop off zone, education center and restroom on the mauka portion of the Highway. Crossing the Highway will continue to be at grade, but no improvements are proposed (overpass, crosswalks, etc.…). While pedestrian safety will continue to be a risk in crossing the Highway, pedestrians will have more room and amenities on the mauka side for their convenience. Congestion along the Highway would continue and there is no plan for Highway resilience. This Alternative proposes to construct a full buildout of the shared use path but the existing shoulder is extremely limited and could not accommodate bikes without moving or widening the existing Highway. While there are many ideas presented for the management of tourism, the basic requirements presented in the Purpose and Need are not met by this Alternative.

Commenter	Comment	Responses
	home about environment preservation/regeneration. Invite local graffiti artists to donate their talents for the murals. Install a "biki" station here and in Haleiwa to allow tourists to bicycle to the area; complete the multi-modal bike path, along the highway makai shoulder, for all users.	
UH Manoa William S. Richardson School of Law	Alternative 5. Pohaku Loa Pedestrian Shift Path Alternative: Shift the location of the Pedestrian Shift Alternative 500 meters to the north, along Kamehameha Hwy. At the Northern intersection of Pohaku Loa Way and Kamehameha Hwy, create the new parking lot and the Kamehameha Hwy can be shifted around it to allow pedestrians and tourists to reach the Beach on the Makai side along a pedestrian walkway without need to cross the highway. By increasing the distance between the parking lot and Laniākea Beach, this alternative will dissuade opportunistic tourists who do not wish to walk the 500 meters to the Beach. The increased distance will also lessen the stress on the sea turtles, monk seals, and other wildlife on Laniākea Beach as distance will limit the number of visitors to the Beach. This alternative will also improve erosion control of Kamehameha Hwy as the roadway will still be moved away from the shoreline, at an even greater distance than the preferred pedestrian shift. Include limited drop-loading area near Laniākea for disabled individuals, families with small children, locals with recreational equipment, and lifeguards, first responders, law enforcement.	The Pohaku Loa Pedestrian Shift Path Alternative would shift the location of the Pedestrian Shift Alternative further north. The purpose of this Alternative appears to be moving any facilities for tourists further away in hopes that the increased distance would limit the number of visitors. However, development of beach support park facilities is outside of DOT's mandate. In addition, in its current alignment, the Pedestrian Shift Alternative avoids archaeological and cultural resources. By shifting the alignment north, these resources would be directly affected. In addition, the section of Kamehameha Highway that is most vulnerable to sea level rise and wave inundation is not addressed by this Alternative. This Alternative does not meet the basic Purpose and Need for pedestrian safety and Highway resilience at Laniakea Beach.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.0 Affected Environment, Potential Impacts, and Proposed Mitigation 3.1 Physical Geography and Coastal Processes The DEA's description of the project area's geological features and kinds of soils present in the area should include an explanation of the significance of the geology and soil and how it relates to the proposed project and its effects in the long-term.	The significance of the soils and geology in the project area become especially apparent in the studies of flora and fauna, coastal erosion, and archeology. Section 3.1 only introduces the topics. The project does not propose to make changes to the geology and soils in the area. The level of analysis is appropriate based on the actions proposed by the project.
UH Manoa William S. Richardson School of Law	The Tsunami Hazards section is very detailed (describing the measurement process, history, and analysis of Tsunamis reaching the island), but this section does not seem to be as urgent or as important to the project and community as the shoreline erosion and climate change sections. Although tsunamis are less predictable than the other natural disasters or concerns listed in the section, it is unclear why disproportionate detail is included here given the low frequency of tsunamis and SEI & FEMA findings. We recommend that the detail here be reduced and adjusted in the various sections be kept proportionate to the significance and risks of and to the project.	The tsunami section is detailed because the Federal Emergency Management Agency used historic tsunami runup to determine the flood zones in this area similar to the rest of the coastline on this side of Oahu.
UH Manoa William S. Richardson School of Law	3.1.1 Existing Condition *Geographic Setting* How many visitors to the project area (on a weekly, monthly, or annual basis) are residents of the North Shore, O'ahu, or Hawai'i? This information should be differentiated and quantified through past or future surveys.	DOT does not collect information on the demographics of who is using their facilities; such data would more likely be collected by the Hawaii Tourism Authority. Differentiating the various users makes no change in the overall usage of the area.
UH Manoa William S. Richardson School of Law	How many visitors to the project area (on a weekly, monthly, or annual basis) are Native Hawaiians engaging in traditional and cultural practices (e.g., surfing, gathering limu or sea salt, fishing)?	DOT does not collect information on the demographics or activities of who is using their facilities. Differentiating the various users makes no change in the overall usage of the area.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	What will be the effect on residents and Native Hawaiian access to Laniākea Beach during the project's construction phase?	Public access for residents and native Hawaiians will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.
UH Manoa William S. Richardson School of Law	*Coastal Erosion* The DEA states that the long-term shoreline position of Laniākea Beach appears stable, yet "[i]f historic trends continue . . . Kamehameha Highway could be eroded away in the near future." Please provide more detailed information on this key issue, historic rates of erosion, differentiate the erosion rates of the various portions of the shoreline in this area, and define "near future" and the timeline.	Please see Appendix D for an in-depth discussion of erosion and the shoreline. More detailed information would not enhance or detract from the overall conclusions of the Draft EA. This analysis is consistent with the level of detail required by Hawaii Administrative Rules 11-200.1.
UH Manoa William S. Richardson School of Law	What are the dates for the "historical aerial photographs" used to analyze the position of the beach low water mark as part of the UHCGG 2010 shoreline erosion study?	The dates vary and are listed in the UHCGG 2010 Shoreline Erosion Study. Please refer to this website: https://www.soest.hawaii.edu/coasts/erosion/
UH Manoa William S. Richardson School of Law	*Sea Level Rise* The DEA does not identify the methodology of the historical extrapolation of the average Laniākea Beach shoreline recession due to increasing sea level rise statewide. The DEA states that, due to increasing sea level rise, "average shoreline recession (erosion) in Hawaiʻi is expected to be nearly twice the historical extrapolation by 2050, and nearly 2.5 times the historical extrapolation by 2100." What is the historical extrapolation of the average shoreline recession due to increasing sea level rise?	Please see Appendix D for an in-depth discussion of erosion and the shoreline that supports the conclusion in the Draft EA document.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	How does this project fit into "big picture" efforts to mitigate the effects of sea level rise that threatens the stability/useability/structure of Kamehameha Highway along the North Shore of Oahu and the coastal highway system statewide? Please explain and include information on DOT's plan to address shoreline erosion for state highways along the coastline statewide and how the Laniākea project aligns, or does not align, with that statewide plan.	DOT recognizes that many areas along the coastal highway system are threatened by erosion and is in the process of evaluating options to address mitigation strategies for our highway system. State of Hawaiʻi Statewide Coastal Highway Program Report (2019) addresses some of DOT's plans for the effects of sea level rise on our highways. This report is used as a reference in Appendix D of the Draft EA. While mitigating effects of sea level rise is important, this project's main purpose and funding mechanism is safety.
UH Manoa William S. Richardson School of Law	Does the CRESI study provide details pertaining to the effect that certain types of adaptation measures, either typical or atypical, might have on Kamehameha Highway should they be adopted instead of simply monitoring the site as recommended?	No, the Coastal Road Erosion Study Index study (CRESI) does not yet provide details on adaptation measures. The study establishes an index system to rank coastal roadway systems by their susceptibility to erosion and structural collapse.
UH Manoa William S. Richardson School of Law	*Floodplains and Flood Hazards* Given that the homes on the makai side of Kamehameha Highway in the project area are at high risks of flooding, what is the risk of flooding for the PSA?	The floodplain designations would stay the same -- Zones VE, AE and D. Please see Section 3.1 and Appendix I.
UH Manoa William S. Richardson School of Law	What were the historic incidents of flooding due to storm surge or rainfall, and not tsunami wave inundation, that have affected and may affect the project site?	There have been numerous examples of highway flooding from rainfall and storm surge but tabulating them serves no purpose for the proposed project. More detailed information would not enhance or detract from the overall conclusions of the Draft EA.
UH Manoa William S. Richardson School of Law	*Tsunami Evacuation Zones* How do climate change impacts affect the analysis of future tsunami evacuation zones in the project area?	As sea level rises, future tsunami evacuation zones will be determined by the City's Department of Environmental Management.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.1.2 Potential Impacts NO BUILD ALTERNATIVE *Coastal Erosion* After major storm events or flooding events how long does the highway typically stay closed?	The length of time the highway is closed depends on the storm event and the extent of flooding. DOT strives to open the road as quickly as possible as it is a vital route.
UH Manoa William S. Richardson School of Law	What have been the nature and costs of repairs?	Kamehameha Highway receives regular maintenance. There have been no recent major repairs in the vicinity of Laniakea Beach.
UH Manoa William S. Richardson School of Law	Sea Level Rise "Not shown in the figure is that much of Kamehameha Highway within the project area would already be inundated by the 0.5-foot sea level rise" -- this indicates that the figures being used are out of date? Please use the most updated information.	No, it does not indicate that the figure is out of date. The figure illustrates a 3.2-foot sea level rise. A figure of the 0.5-foot sea level rise was decided to be unnecessary due to the amount of existing documentation regarding the inundation that already occurs and is available in the Draft EA.
UH Manoa William S. Richardson School of Law	PEDESTRIAN SHIFT ALTERNATIVE Are there examples of similar HDOT projects in size and scope? If so, what was the average difference between estimated and actual time to completion? What was the average difference between estimated and actual costs to complete? Does the estimated project costs take into account the rising fair market value of the real property acquisitions needed to complete this project should the project be delayed for any extended period of time?	No, there are no comparable examples in size and scope that have been constructed. The State of Hawaii Statewide Coastal Highway Program Report (2019) prioritizes other highway segments. However, there will be many more projects like this where the highway has to be shifted inland in the future. Construction estimates are based on best estimates by design engineers. No, the costs are based on the current schedule, and they do not take into account an extended delay; costs fluctuate, and estimates are based on the current market.
UH Manoa William S. Richardson School of Law	What, if any, are the mitigating measures to reduce the anticipated noise and light pollution/nuisance affecting the wildlife and nearby residences during the construction phase of this project?	Please see the sections regarding noise (3.16.3) and biological resources (3.16.5) for mitigation measures for construction impacts.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	*Coastal Erosion* How will the project mitigate potential coastal erosion problems caused by the removal or alternation of existing vegetation along the shoreline?	DOT does not plan to remove coastal vegetation and will maintain vegetation in its right-of-way near the shoreline. DOT will develop a plan to maintain the vegetation.
UH Manoa William S. Richardson School of Law	The DEA does not provide sufficient detail on how this proposed project would protect the highway from the impacts of coastal erosion, which is likely to continue to push the shoreline inland in this area in the long-term.	The project is an interim solution for protecting the highway from the impacts of coastal erosion. Previous alternatives (see Section 2.5) would have moved the road further inland, but they were rejected for a variety of reasons detailed in that section.
UH Manoa William S. Richardson School of Law	The DEA states: "As described in Section 2.4, the proposed highway consists of normal asphalt road structure with a buried concrete cut-off wall on the makai edge, which would protect the road from being undermined or washed out during severe flood events." Has DOT analyzed this kind of erosion mitigation (hard concrete buried wall) versus installation a permeable structure, a permeable highway surface, or a more climate-resilient surface treatment method other than traditional asphalt paving?	Permeable pavement is not as strong as traditional or asphalt pavements.
UH Manoa William S. Richardson School of Law	Sea Level Rise What analysis shows that moving the highway approximately 80 ft inland under the PSA would protect it from the impacts of sea level rise, estimated at 3.2-foot?	The project is an interim solution for protecting the highway from the impacts of coastal erosion. Previous alternatives (see Section 2.5) would have moved the road further inland, but they were rejected for a variety of reasons detailed in that section. The analysis is based on research conducted by the University of Hawaii Sea Grant Engineering Program and the Department of Land and Natural Resources Office of Conservation and Coastal Lands. It is presented in the 2021 State of Hawaii Sea Level Rise Viewer, Version 1.04.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Has DOT considered the scenario for faster and higher sea level rise given recent global climate “tipping point” events?	No, DOT is using currently accepted models as referenced in the Draft EA. Please see Appendix D for greater detail.
UH Manoa William S. Richardson School of Law	Given that the PSA has an estimated 45 years of service – thus, until 2068, if completed in 2023 – how does the PSA align with a long-term solution after 2068 until the end of the century, given sea level rise and other geophysical factors?	The project is an interim solution for protecting the highway from the impacts of coastal erosion. Previous alternatives (see Section 2.5) would have moved the road further inland, but they were rejected for a variety of reasons that are detailed in that section. In the future, the road may have to be moved further inland. DOT generally designs their roadway projects to have a 50-year lifespan.
UH Manoa William S. Richardson School of Law	*Flood and Tsunami Hazards* The DEA states that the PSA could “trap” a tsunami in a limited area. What are the implications of this “trap” on the nearby residential area or the coast?	There would be no impacts to the nearby residential area or coast due to the 'trapping' of a tsunami. The area that would be affected is open pastureland. Please refer to Section 3.1 and Appendix I for an in-depth understanding of the detailed modeling for tsunami runup.
UH Manoa William S. Richardson School of Law	3.1.3 Avoidance, Minimization, and Mitigation Measures This section highlights the potential flooding hazards in the project area and aligns with 3.1.2 (potential impacts). The section concludes that there are no measures to avoid, minimize, or mitigate damage because inundation would not affect any structures. This section begins with an acknowledgment that the proposed road for the PSA would be in a flood zone, so the DEA should address avoidance, minimization, or mitigation measures for flooding, particularly given that that this is a key arterial highway for the North Shore.	By structures, the Draft EA was referring to buildings. The potential hazard for the highway facility would not be eliminated but has been minimized by moving the road inland. The VE flood designation for the area in question is from coastal flooding, not upland flows. Therefore, moving the roadway mauka would minimize flooding to the new roadway.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.2 Land Use 3.2.1 Existing Condition We encourage the DOT to consult with landowner Kamehameha Schools to ensure that future land uses in the surrounding area are aligned with the results of this proposed Project.	DOT has been actively consulting with Kamehameha Schools / Bishop Estate (KSBE) throughout the project's development. KSBE recently clarified that the three residential projects described in KSBE's North Shore Master Plan -- Papailoa Residential Infill, Kapaeloa Residential Infill, and Kuikuiloloa Agricultural Area -- are not being actively pursued. KSBE will seek community input before it considers any residential projects in the area.
UH Manoa William S. Richardson School of Law	3.3 Historic and Archaeological Resources A recent archeological survey identified two historic properties in the affected area. These include SIHP Site L-Bridge, a 1930s reinforced concrete bridge that meets the definition of a historic property, and SIHP Site T-1, which is a possible ceremonial site and includes Kahokuwelowelo and Iliikea heiau. Both sites have been identified as significant thus requiring a "significance assessment." (H.A.R. § 13-276-6). Has the significance assessment been provided to SHPD as required in H.A.R. 13-276-6(D)? The status of the significance assessment is not clear in the DEA but the H.A.R. indicates that SHPD must concur before significance is finalized. The language of Section 3.3 is not clear on whether both sites have been deemed significant. Is a copy of the significance assessment available as an attachment? There does not appear to be one listed as an Appendix. If the significance assessment cannot be provided, what specific research has or will be conducted for each of the "significance" criteria pursuant to H.A.R. 13-275-6? The language of Section 3.3 references Section 3.4 regarding "other related sites" that may have significance. Have	The Archeological Inventory Survey is not included as an appendix to protect the sites. The significance assessment is provided in Section 3.3.2 of the Draft EA. Hawaii Revised Statutes (HRS) Chapter 6E-8 coordination is ongoing with the State Department of Land and Natural Resources State Historic Preservation Division. The sites that are being referenced are well-known and documented. At the time of the publication of the Draft EA, DOT had previously consulted with Kamehameha Schools / Bishop Estate and was in the process of consulting with the State Office of Hawaiian Affairs regarding the ceremonial site's significance. The coordination between agencies has not resulted in any change to the significance as determined. SHPD must concur prior to significance being finalized for the purpose of HRS Chapter 6E-8 but it does not preclude our use for understanding the project's impacts in regards of HRS Chapter 343. Should SHPD disagree with the significance as determined, DOT would reevaluate its disclosure statement under HRS Chapter 343.

Commenter	Comment	Responses
	these other sites also undergone the relevant significance assessment? Given the importance of this area of evaluation additional specificity and clarification of the relationship among the sites may be useful.	The "other related sites" being referenced in Section 3.4 were determined to be too geographically removed from the project to be potentially affected or would not fall under the purview of HRS Chapter 6E-8.
UH Manoa William S. Richardson School of Law	Physical avoidance during construction does not necessarily mean no impact. Would realignment and new construction of the bridge cause potential geographical impacts to the existing bridge?	The Draft EA notes that the change in use and alterations to the immediate surrounding environment are an effect to the existing Lauhulu Stream Bridge, therefore the proposed determination is "effect with proposed mitigation". This is discussed in Section 3.3.4.
UH Manoa William S. Richardson School of Law	H.A.R. § 13-276-6 requires that "Prior to submission of significance evaluations for properties other than architectural properties, the agency shall consult with ethnic organizations or members of the ethnic group for whom some of the historic properties may have significance under criterion "e" to seek their views on the significance evaluations. For native Hawaiian properties which may have significance under criterion "e" the Office of Hawaiian Affairs also shall be consulted." (HAR § 13-275-6(c)). Has OHA been consulted regarding this site? In Section 3.4, the DEA indicates that OHA did not respond to an initial inquiry. Additionally, in the listing of Hawaii Agencies, OHA was not listed as having provided any comments. If OHA does not comment, what constitutes the required consultation?	At the time of the publication of the Draft EA, DOT consulted with the State Office of Hawaiian Affairs (OHA) regarding the ceremonial site's significance. OHA has not yet responded to this specific request. If OHA does not respond, the project has still met the minimum consultation requirements per HAR § 13-275-6(c). The significance of the site has also been reviewed by Kamehameha Schools / Bishop Estate and those that participated in the Cultural Impact Assessment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Given that the site is on Kamehameha Schools property, what is its position on the project and alternatives (independent of the position of the lessees of the property)?	DOT has been actively consulting with Kamehameha Schools / Bishop Estate (KSBE) throughout the project's development. KSBE educated DOT regarding the cultural and archaeological significance of the sites on their property, as well as the overall land use of the property, including the ranching operations and the trespassing issues they have dealt with. Their position is reflected in the comments they provided regarding the Draft EA, in Appendix A-2.
UH Manoa William S. Richardson School of Law	According to Section 3.3.3, ownership and control of Site T-1 will not be acquired by the HDOT. The DEA states that Site T-1 is on Kamehameha Schools property and the only concerns are during construction. After construction, the "treatment of Site T-1 is ultimately their kuleana." (P. 3-16). How were the findings regarding construction activities and potential effects communicated to Kamehameha Schools?	Kamehameha Schools / Bishop Estate (KSBE) was provided a copy of the Archaeological Inventory Survey as well as the Cultural Impact Assessment. There were also multiple meetings with their group to gather their input and comments about the proposed project.
UH Manoa William S. Richardson School of Law	Did Kamehameha Schools acknowledge receipt of the findings or provide any comments?	Yes. In addition to their formal comments on the Draft EA (which can be found in Appendix A-2), KSBE educated DOT regarding the cultural and archaeological significance of the sites on their property, as well as the overall land use of the property, including the ranching operations and the trespassing issues they have dealt with. Formal, non-public comments were also provided to DOT regarding the Archaeological Inventory Survey and Cultural Impact Assessment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	How will DOT take responsibility for monitoring and mitigating the long-term effects of this project on sites like T-1?	Please refer to Section 3.3.3 for this discussion.
UH Manoa William S. Richardson School of Law	In their letter responding to the DEA (PDF, p. 161), Kamehameha Schools suggests that both the Waialua Hawaiian Civic Club and Waialua area cultural descendants be consulted. Section 3.4 indicates that the Waialua Hawaiian Civic Club was notified (but did not respond). Please clarify whether the individuals listed are Waialua area cultural descendants as described by Kamehameha Schools and the efforts to consult them.	The project team attempted to reach out to lineal descendants through the process of developing the Cultural Impact Assessment. There is no formal directory of lineal descendants, so we rely on their voluntary participation in project planning.
UH Manoa William S. Richardson School of Law	Because Site T-1 is interpreted to be a "possible" ceremonial site, how would the effects analysis and mitigation measures differ if the site was confirmed to be a ceremonial site?	There is no difference between a "confirmed" and "possible" ceremonial site with regard to effects analysis and mitigation measures.
UH Manoa William S. Richardson School of Law	More details should be provided on the lease conditions for lessees on Kamehameha Schools lands that may be affected by the project.	The conditions of the lease are not relevant to the impacts analysis. DOT assesses the impacts to the land use.
UH Manoa William S. Richardson School of Law	The description of the ceremonial site is that it is partially within the current study but that it "falls outside the proposed development footprint (p. 3-16)." The report indicates that "once roadway construction is complete the realigned Kamehameha Highway will be no closer to Site T-1 than it is currently" (p. 3-17). How far away is the site from the project?	The Department of Land and Natural Resources State Historic Preservation Division is aware of the location of this site. It is not general practice to make this information available to the public due to its sensitivity.
UH Manoa William S. Richardson School of Law	What is the potential impact on the site itself during construction?	Site T-1 is geographically removed from the project location and will not be affected by construction of the project.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	How will roadway construction impact those who may be currently accessing the site?	Site T-1 is geographically removed from the project location and will not be affected by construction of the project. It is located on private property owned by Kamehameha Schools / Bishop Estate and is not available for general public access without permission from the landowner.
UH Manoa William S. Richardson School of Law	The description indicates that the Kahokuwelowelo and Iliikea heiau are in the relevant area: approximately how far away from the project site are they located? Are they included in the significance assessment (see questions above related to significance)?	These sites are not within the project area, as defined by Hawaii Administrative Rules § 13-275-2. The Department of Land and Natural Resources State Historic Preservation Division is aware of the location of this site. It is not general practice to make this information available to the public due to its sensitivity.
UH Manoa William S. Richardson School of Law	Section 3.3.4 states that an archeological monitoring plan will be developed prior to "initiating and ground-breaking activities" as required by H.A.R. § 13-279-4. What is the timeline for development of the archeological monitoring plan in the context of the project?	The Archaeological Monitoring Plan will be developed prior to the contract being bid.
UH Manoa William S. Richardson School of Law	H.A.R. § 17-279-4 requires a written plan – when and how will DOT develop this plan?	The Archaeological Monitoring Plan will be submitted and accepted by the Department of Land and Natural Resources State Historic Preservation Division prior to construction. DOT has already initiated coordination with SHPD regarding the language and expectations regarding the monitoring.
UH Manoa William S. Richardson School of Law	If iwi kupuna are discovered, work would be halted; what is the nearest site in which iwi kupuna have been discovered in the past?	Based on previous surveys and ongoing coordination with Kamehameha Schools / Bishop Estate, DOT is aware of sensitive areas. The project has been designed to avoid such areas.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Both sites required H.R.S. § 6E-8 review, the review process link (PDF, p. 108, Section 4.2.1) State Historic Preservation | HRS 6E-8 & 6E-42 Review Process (hawaii.gov) It seems that only the first three steps were completed? Please clarify. Step 4 mitigation comments (H.A.R. § 275/284-8(a)): If a project will have an effect on significant historic properties, then mitigation commitments must be proposed/agreed to. Mitigation shall be specific to each property affected. Has Step 4 been completed? Step 5 development of mitigation plans (H.A.R. § 275/284-8(h)): After mitigation commitments are accepted, the agency shall develop detailed mitigation plans and provide them to the SHPD. Has Step 5 been completed?	The project is currently at Step 4. All steps will be completed prior to construction. The monitoring will be an activity that is ongoing during construction.
UH Manoa William S. Richardson School of Law	*Cultural Impact Surveys* Limited number of respondents: ASM Affiliates (ASM), the HDOT contractor responsible for conducting the CIA, identified thirteen individuals and organizations it believed possessed the knowledge required to identify the proposed cultural impacts of the project. This number or respondents appears low given the total population of the area in question. Laniākea Beach lies within the 2.3 square mile moku of Waialua that as of 2020 has a population of about 4,000 people. Only four individuals agreed to answer ASM's interview requests.	The number of interviewees is not based on overall population, but the population of individuals with cultural knowledge of the area. It is not uncommon to only have a few individuals with cultural knowledge volunteer to participate.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	What follow-up efforts were made, or are being made, to secure additional interviews of individuals with cultural knowledge?	DOT in general will not pressure individuals to participate. This has been particularly true during this time of COVID.
UH Manoa William S. Richardson School of Law	Does DOT consider four respondents sufficient?	Yes. As the area is owned by Kamehameha Schools / Bishop Estate, a group with substantial knowledge of the area and ties to groups with current cultural practices on their property. DOT has coordinated extensively with them.
UH Manoa William S. Richardson School of Law	Due to the extenuating circumstances of COVID, the DOT should make extra effort to solicit the opinions of the 9 nonresponsive ASM Affiliates-identified individuals and organizations again to provide a more comprehensive understanding of the area.	The number of interviewees is not based on overall population, but the population of individuals with cultural knowledge of the area. It is not uncommon to only have a few individuals with cultural knowledge volunteer to participate. DOT in general will not pressure individuals to participate. This has been particularly true during this time of COVID.
UH Manoa William S. Richardson School of Law	In its public comments, Kamehameha Schools recommends talking with Waialua-area cultural descendants and the Waialua Hawaiian Civic Club to get a local perspective on the cultural importance of the area. Did ASM conduct this outreach effort?	The project team attempted to reach out to lineal descendants through the process of developing the Cultural Impact Assessment. There is no formal directory of lineal descendants, so we rely on their voluntary participation in project planning.
UH Manoa William S. Richardson School of Law	How completely did ASM follow OEQC Guidelines for Assessing Cultural Impacts?	Yes. ASM followed the OEQC Guidelines for assessing the project's potential cultural impacts. OEQC's guidelines are just that and do not comprise a checklist of items that must be completed.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	COVID-19 Pandemic limited collection methodology: Citing the OEQC Guidelines for Assessing Cultural Impacts-Section III, ASM identified the constraints and limitations which affected the quality of information it obtained. COVID-19 and the consequential "Stay-at-Home" orders issued during ASM's survey limited their ability to meet with people with cultural or historical knowledge of the area. Did ASM consider other methods for interviews such as phone, zoom, mail, e-mail, or video-recorded testimonials?	If there was an individual who wanted to participate but did not wish to conduct an in-person interview would have volunteered, these would have been options made available to them.
UH Manoa William S. Richardson School of Law	*Existing Condition* Kawailoa Plain contains "a good amount of archaeological and cultural studies with findings spanning from pre-contact to early and late Historiceras," with the inclusion of three heiau located just north of the project area. Multiple residents expressed concern that one of these heiau is considered to be within a cultural landscape that extends into the project area, and that construction or the resulting raised tourism levels could be of detriment to these sites. These concerns warrant further interviews to determine effects and significance.	The project is not anticipated to increase tourism in the area. The cultural landscape is located on private property owned by Kamehameha Schools / Bishop Estate and is not available for general public access without permission from the landowner.
UH Manoa William S. Richardson School of Law	Jaucas sand, an indicator of burial sites in past instances, has been identified directly within the project area. Additional interviews should be conducted to further document the potential for impacts given this condition.	The project team and agencies are aware of the prevalence of Jaucas sand and its potential significance. DOT committed to archaeological monitoring for this reason. Interviews are not successful for identifying the location of iwi kupuna, for obvious reasons.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	The DEA indicates that "background research and consultation process did not identify any ongoing traditional cultural practices within the current project area [but] several such practices do occur in the vicinity of the project area, including surfing, limu picking, subsistence fishing (including with a pole and throw net) and diving." Collection and analysis of more interviews on these issues with practitioners should be conducted to identify potential indirect and secondary effects of the project.	Adequate research has been performed to determine that there would not be indirect or secondary effects to traditional and cultural practices. Public access for cultural practitioners will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.
UH Manoa William S. Richardson School of Law	*Kahokuwelowelo Heiau* "Kahokuwelowelo Heiau is situated outside of the project area but is considered to be part of a larger cultural landscape that extends through the current project area to the shore." The exact location of the Kahokuwelowelo Heiau and its perimeter to the project area are not clearly stated or mapped out, thus making it difficult to assess potential impacts. Although there may be legitimate reasons for not disclosing the exact site of Kahokuwelowelo Heiau, how does DOT install a sufficient protective perimeter to mitigate potential impacts during and after construction?	DOT's practice is not to give the exact location of heiau, burials, and other historic and cultural site in public documents to avoid desecration. A protective perimeter is not proposed for Kahokuwelowelo since the Heiau is distant from the project location. Protective measures will be installed for Site T-1.
UH Manoa William S. Richardson School of Law	How will DOT coordinate with the landowner and "interested community members and organizations such as I Nui Ke Aho, a non-profit organization who cares for and conducts ceremonies at Kahokuwelowelo and other sites in Waialua" to ensure no impacts to these cultural sites?	DOT has been coordinating with KSBE. KSBE is and has been the primary active steward of Kahokuwelowelo Heiau for over the last 10 years. KSBE coordinates and collaborates with numerous community groups and educational institutions in this regard.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	*Kamehameha Schools Land Acquisition* Details regarding the potential purchase of land from Kamehameha Schools (timeline, cost, obstacles) should be disclosed because the preferred alternative depends on the usage of Kamehameha Schools' property. Because the current lessee has objected to use of the leased land for the highway realignment in the past, how can DOT ensure the cooperation of Kamehameha Schools in the required land acquisition for the project?	DOT has been coordinating with KSBE and there are no indications that the land acquisition is in jeopardy. At the outset of each project phase, DOT develops risk management strategies to meet their schedule and budget.
UH Manoa William S. Richardson School of Law	3.4.2 Potential Impacts The DEA does not mention how their proposed project will impact Native Hawaiian custom and practice.	Adequate research has been performed to determine that there would be no direct impacts to traditional and cultural practices. Public access for cultural practitioners will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction.
UH Manoa William S. Richardson School of Law	The sea turtles that rest at Laniākea Beach have served as aumākua, or deified family guardians, of Kanaka Maoli for centuries. The fourth verse of the Kumulipo, the Hawaiian creation chant, mentions the honu (green turtle) and honu'ea (hawksbill turtle). The DEA does not the effect or effects the proposed project would have on this Hawaiian tradition and custom. The DEA does not identify any Hawaiian families or individuals who may have practices related to these aumākua and how such practices may be affected by the construction or operation of this project. The preferred alternative would increase the number of cars that could park in the vicinity of the Laniākea Beach from 50 to 90, almost double. It would provide an area for tour buses. Thus, the proposed	No Hawaiian families or individuals have commented that their cultural practices involving sea turtles would be affected. Adequate research has been performed to determine that there would be no direct impacts to traditional and cultural practices. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public throughout the duration of construction. The EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With

Commenter	Comment	Responses
	project will likely substantially increase the number of people who could disturb, harass, molest, and annoy the sea turtles, as well as practitioners of hōʻaumakua. As such, HDOT needs to conduct a more in-depth Cultural Impact Assessment (CIA) to account for the cultural obstruction the proposed project will create. An Environmental Impact Statement (EIS) can accomplish this.	informal or non-designated parking, the number of cars would be similar to existing accommodations. The use of Laniakea Beach is more tightly tied to tourism than the proposed project. The project will not increase the number of users along Kamehameha Highway. The level of impact due to the project does not warrant an Environmental Impact Study.
UH Manoa William S. Richardson School of Law	*Cultural Impacts on Recreational and Cultural Practices* If construction limits or prevents access to Laniakea for an indefinite amount of time, this is a significant effect under § 11-200-12, HAR, as it curtails the range of beneficial uses of the environment.	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public.
UH Manoa William S. Richardson School of Law	What is the DOT's plan for an alternative parking arrangement to ensure coastline access for recreational and cultural access during construction?	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public. DOT does not plan to find an alternative parking arrangement.
UH Manoa William S. Richardson School of Law	During construction, how does the plan to eliminate the parking across from Laniakea on the Laniakea Support Park parcels comport with H.R.S. Chapter 205A?	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	What will be the spillover impact on the surrounding neighborhoods during the construction shut-down period?	There is no defined shut-down period during construction. Vehicles may seek parking further from Laniakea as they do now. DOT is not suggesting any mitigation measures, as DOT is working to maintain access to the informal parking area that currently exists. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public. People are likely to continuing parking on the shoulders and crossing the street in other locations along the highway as the current condition exists.
UH Manoa William S. Richardson School of Law	How will the shut-down period affect access for people with disabilities and families with small children?	There is no defined shut-down period during construction. Access to parking will be available during construction as coordinated around the Contractor's work areas. -Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public. Currently, there are no special facilities for those with disabilities or families with small children.
UH Manoa William S. Richardson School of Law	Will Laniakea Beach Support Park be maintained for recreational activities during and after construction?	Laniakea Beach Support Park has never been formally developed or maintained for recreation. There was a Final EA and Finding of No Significant Impact determination in 2005 but there are no current plans to develop Laniakea Beach Support Park. The preferred alternative does not preclude the development of a park.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	During construction, how will DOT mitigate the spillover effect of people parking on the shoulder of the highway and crossing the highway?	Vehicles may seek parking further from Laniakea as they do now during construction. DOT is not suggesting any mitigation measures, as DOT is working to maintain access to the informal parking area that currently exists. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public. People are likely to continuing parking on the shoulders and crossing the street in other locations along the highway as the current condition exists.
UH Manoa William S. Richardson School of Law	3.5 Biological Resources 3.5.1 Existing Condition Section 3.5.1 provides an overview of the biological resources in the project location. The area was surveyed on three occasions (October 2019, August 2020, and March 2021). Three study dates, conducted across three calendar years is insufficient to fully catalog the resident species of the area.	The current studies that have been conducted have been performed by qualified local biologists that have extensive knowledge of the biological resources in the area. The distribution of threatened and endangered species is well-documented and considered during the surveys that are conducted. The three documented site visits are sufficient to evaluate the existing environment at this project site.
UH Manoa William S. Richardson School of Law	Appendix E correctly states that the project area is relatively dry, with 36 inches of annual rainfall, and the peak rain fall occurring in January. Anecdotally, these seasonal weather patterns result in drastic alterations of the physical environment at Laniākea, including the addition/subtraction of sand from the beach and the creation of temporary streams and waterways in the wetter months. The study conducted surveys in March, August, and October, all of which are comparable in rainfall and on the lower end of the annual precipitation	The current studies that have been conducted have been performed by qualified local biologists that have extensive knowledge of the biological resources in the area. The distribution of threatened and endangered species is well-documented and considered during the surveys that are conducted. The three documented site visits are sufficient to evaluate the existing environment at this project site.

Commenter	Comment	Responses
	spectrum. Without additional survey dates during the rainy season (December to February), how can the DEA be certain of the presence/absence of additional species, including endangered ones?	
UH Manoa William S. Richardson School of Law	How can limited surveys conclude the absence of waterbirds in the project area ("no waterbirds were observed utilizing the Lauhulu Stream area") when no surveying was conducted in the rainy season, the wettest portion of the year in the project area?	The study only stated that there were no waterbirds observed, not that they are not present in the project area. The study conclusions and project determination rely on background and historical data as well as the site visits that were conducted.
UH Manoa William S. Richardson School of Law	All of the survey dates were conducted during daylight hours, yet the DEA makes conclusions regarding the absence of endangered, nocturnal species such as the Hawaiian hoary bat and Hawaiian short-eared owl ("Pueo"). How can the wildlife survey be relied upon without nocturnal sampling?	The study conclusions and project determination rely on background and historical data as well as the site visits that were conducted. There are established mitigation measures that have been researched and determined to be effective by the U.S. Fish and Wildlife Service and the Department of Land and Natural Resources. Mitigation measures concerning any tree removal will be in the construction documents addressing hoary bats because no matter how many surveys there are, they might still have gone unnoticed. The pueo is diurnal and most likely seen during the day.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	**3.5.2 Potential Impacts & Appendix E** Appendix E provides a few recommendations to mitigate the impact on protected resources including Pueo and the Hawaiian hoary bat. The DEA only briefly mentions that Honu, or Green Sea Turtles, were spotted in the water during the survey. As a protective measure, the DEA suggests that construction activities "be monitored to ensure that neither of these two marine species (Honu and Monk Seals) are disturbed." The assessment inexplicably minimizes the significant and well-known presence of Honu on the shores of Laniākea. The description gives the impression that the Honu are only occasionally spotted in the waters surrounding Laniākea beach. However, the beach is known for the large number of Honu that come ashore daily. The unusual basking behavior of Honu on this beach, their feeding activity in the nearshore area, and their high numbers in the area are, in fact, the reason for the increasingly high levels of tourism and the "pedestrian" problem that is the current justification for the project. It is surprising and puzzling that Honu were not fully surveyed or considered in the DEA. A thorough marine resources survey should have been conducted for the DEA. Without such a survey, the potential impacts cannot be properly assessed, and the mitigation measures will likely be inadequate.	Thank you for your comment. DOT recognizes that Laniakea Beach is known for a large number of turtles. The project is not on the beach; the turtles do not access Kamehameha Highway. The project is not proposing any construction activities on the beach or in the marine environment. There will be mitigation measures for night work to control lighting which may attract turtles as noted in Section 3.16.5 of the Draft EA. The City and County Department of Parks and Recreation and other agencies may decide to manage tourism at the site. There is ongoing coordination between DOT and other agencies regarding tourism and behaviors at Laniakea Beach.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	**3.5.2 Potential Impacts & Appendix E** The recommendations provided in Appendix E are cursory and insufficient for species that are protected under federal and state endangered species laws. The recommendations leave open for interpretation the level of protection to be afforded during the project, which is problematic. The general recommendation of "monitoring" the turtle species during construction offers little information on specific monitoring activities, who is responsible for monitoring, or how potential interference with such species will be mitigated. Additional details should be provided.	This recommendation was a general statement that would be applicable in the event that work would occur on the beach or in the marine environment. The project is not proposing any construction activities on the beach or in the marine environment.
UH Manoa William S. Richardson School of Law	Additionally, the DEA does not discuss the secondary impacts of the project. By creating more parking and increasing access to Laniākea beach, the project will enable more growth in the number of visitors. The effects of such growth on biological resources in the area were not considered or discussed in the DEA. Section 3.5 even acknowledges that "the cove has become known as 'Turtle Beach' and is a popular destination for tourists to observe the species closely." However, Appendix E does not point out the impact of the project on the number of visitors or crowding of the marine resources, in particular Honu and Monk Seals. There have been many reports of Monk Seal and Honu harassment as a result of the large tourist crowds at Laniākea. The State Department of Land & Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniākea in order to prevent a spike in tourist harassment. Increasing the amount of parking, without mitigating measures, will likely lead to increased	DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular area.

Commenter	Comment	Responses
	negative impacts on protected species and should have been fully analyzed in this section of the DEA.	
UH Manoa William S. Richardson School of Law	Another secondary impact not considered is the increase in irresponsible fishing that could occur as a result of increased parking with the project. This could have negative impactson the Honu due to accidentally hooking or entanglement in line. These potential impacts should have been thoroughly considered in the DEA and recommendations should have been provided to mitigate these concerns.	DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors or users of Laniakea Beach. The State Department of Land & Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniakea which will help supervise fishing in the area.
UH Manoa William S. Richardson School of Law	The Methods of Study for the survey of the terrestrial, vegetation and wildlife survey indicates that the study was conducted by LeGrande Biological Survey Inc. flora and fauna. Did the consultant reached to state and federal agencies, and community members, who have substantial expertise in these marine protected species issues, in this location, for data, analysis, and mitigation recommendations?	The following agencies were consulted, and their recommendations have been incorporated into the project's design and overall consideration throughout the duration of the development of the project. Early coordination with the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, and the State Department of Land and Natural Resources was used by the project team in the alternatives analysis, as discussed in Section 2.5 of the Draft EA. The scope of the environmental studies that were performed to define the alternative as proposed was also supported by these early coordination efforts.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	*Proposed Mitigation of Impacts on Endangered Species* Appendix E proposes a pre-construction nest survey to verify the presence/absence of pueo, which we commend. However, in the event pueo are discovered in the project area, the proposed mitigation is to cordon off the nest and establish a "50-foot buffer" to avoid construction disturbances. Is this sufficient protection for a nesting endangered species? How was this figure obtained? What is the basis for this proposal as sufficient mitigation?	A 50-foot buffer is what the State Department of Land and Natural Resources Division of Forestry and Wildlife typically requires.
UH Manoa William S. Richardson School of Law	The DEA acknowledges the presence of both Green and Hawksbill Turtles, species known to be affected by artificial light. The proposed streetlights implemented in the Pedestrian Shift Alternative will be spaced every 120 feet and equipped with flat lens fixtures to reduce glare and shield light, but can this be certain to have no significant impact on the turtles, as well as migrating birds, without further study and analysis?	DOT uses these lights along many highways and their impacts to turtles and migrating birds have been studied. These lights will replace existing lights and they will be further from the shoreline and therefore even less likely to attract turtles.
UH Manoa William S. Richardson School of Law	We agree with the importance of declaring artificial lighting as an issue for sea turtles. However, we would like this point to be more developed. The draft environmental assessment should explain the negative impact artificial lighting has on turtles and stress the fact that it should be avoided by the project. If the lighting is critical for the project, this should be explained. The draft should include with this sentence that the lighting can cause problems for resting turtles, foraging turtles, and nesting sea turtles and their hatchlings (even if Laniākea may not be a known nesting area at this time, recent nesting activity has increased in "new areas" along the North Shore during the COVID shutdown).	DOT uses these lights along many highways and their impacts to turtles have been studied. These lights will replace existing lights and they will be further from the shoreline and therefore even less likely to attract turtles. Section 3.16.5 and 3.5 have been revised to reflect your comment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	The proposed mitigation during the construction phase for pupping Hawaiian hoary bats is a blanket restriction on cutting down any trees less than 4.6 meters in height. No nocturnal surveys have been done to confirm the presence/absence of bats in the project area. Since the bats "use multiple roosts in their home territories," how was this threshold tree height determined? How can the DEA conclude this arbitrary height will result in no significant impact on the hoary bats, if present (which is unknown due to insufficient nocturnal surveying), particularly when Appendix E acknowledges the significant threat deforestation poses to adult females and pups, which may be unable to flee a tree being felled? Given the bats' endangered status, this would suggest a finding of significant impact, at least until further surveys can more conclusively determine the true probability of bats nesting in the area and the basis for the tree-height threshold and its efficacy in protecting bats during construction.	DOT does not determine that height; it is a restriction regularly placed on construction projects by the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service has determined that implementation of this mitigation measure is sufficient to protect the pupping of the Hawaiian hoary bat and would not result in any significant impact.
UH Manoa William S. Richardson School of Law	*Section 3.6.1* The DEA does not adequately describe the USFWS designated wetland area. The DEA states, "The stream channel itself is intermittent and appears to have water flow only during heavy rain events. Additionally, an area to the west of the stream is mapped as an estuarine and marine wetland by the NWI, but no evidence of standing water was observed to the west of the intermittent stream during site surveys in March 2021 (Appendix E and Section 4.2.2). No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during site surveys and no wetland soils were present."	The U.S. Fish and Wildlife Service does not have jurisdiction over wetland areas. The project team is in coordination with the U.S. Army Corps of Engineers. The Draft EA relied on initial indicators regarding the presence or absence of a wetland. A formal Wetland Delineation has been performed.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Appendix E on the Wildlife and Terrestrial Vegetation Survey did not clearly include specific times of day that the survey was conducted to compile list of impacted wildlife and terrestrial vegetation (e.g., “No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during site surveys and no wetland soils were present.”) The areas that constituted the wetland that was mentioned were unclear and confusing, both from the textual description and the accompanying images, and are need further clarification.	The Draft EA relied on initial indicators regarding the presence or absence of a wetland. A formal Wetland Delineation has been performed.
UH Manoa William S. Richardson School of Law	*Section3.6.2* Under the Pedestrian Shift Alternative, the new bridge would create more stormwater from the impervious road surface than the existing bridge. The DEA appears to discount the effect by asserting “[T]he amount of existing impervious surface would be lower when one lane of the current Kamehameha Highway is removed.”	The impervious surface that would be created by the new bridge was considered in the stormwater design calculations for the project.
UH Manoa William S. Richardson School of Law	Was there an evaluation of stormwater runoff generated from the existing bridge and how the amount of stormwater runoff from the new bridge may differ?	The impervious surface that would be created by the new bridge was considered in the stormwater design calculations for the project.
UH Manoa William S. Richardson School of Law	More information is needed to understand the impact created in higher generation of stormwater runoff from the proposed new bridge from the existing bridge.	The impervious surface that would be created by the new bridge was considered in the stormwater design calculations for the project. These calculations included the anticipated stormwater runoff due to the existence of both facilities. The stormwater swales will be designed based on the amount of stormwater runoff anticipated due to the additional impervious surface. Any new storm water runoff created by the impervious surface associated with the project is relatively small

Commenter	Comment	Responses
		compared to the storm water that is generated off-site during rain and storm events in the area.
UH Manoa William S. Richardson School of Law	A visual representation of the new bridge and details should be included in this section, as the text used make it hard to understand exactly how the new bridge will differ from the old bridge in terms of size, location, and direction.	The proposed bridge is designed to a sufficient level of detail to determine its impacts. It will be at more of an angle because the road will curve, and it will be longer to keep its foundation out of the stream.
UH Manoa William S. Richardson School of Law	*Section 3.6.3* "The design for the bridge would not require any permanent structural components be placed in the stream." This statement is hard to evaluate with at least conceptual design information about the new bridge. This information should have been included in the DEA.	The proposed bridge is designed to a sufficient level of detail to determine its impacts. The structural analysis shows that no permanent structural components have to be placed in the stream.
UH Manoa William S. Richardson School of Law	Regarding the vegetative swale ("The project will also implement the permanent Best Management Practice (BMP) of vegetated swales across the mauka side of the existing road to carry stormwater and to allow infiltration…"), DOT should specify utilizing native plant species for habitat restoration.	DOT has a list of appropriate plants for highway projects, and they will be specified in the construction documents.
UH Manoa William S. Richardson School of Law	*3.7.1 Existing Conditions* Laniākea Beach attracts the very visitors - "locals and tourists alike" - whom DOT seeks to protect with its proposal to improve pedestrian safety. It is, therefore, vital to balance the management of visitors and potential impacts on the surrounding environment. Residents and tourists frequent the area to access popular surf spots and to watch Honu rest, feed, and swim at Laniākea Beach.	DOT seeks to provide safe highway infrastructure for all users. The design is intended to accommodate the City and County Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. DOT has been coordinating with other agencies, but this is a transportation project. The following agencies were

Commenter	Comment	Responses
	The accessibility to the high numbers of Honu on the shoreline attracts large numbers of tourists and that attraction for tourists plays a key role in the “people management” issues that lead to traffic congestion and pedestrian safety concerns. The City and County of Honolulu Department of Parks & Recreation owns key parcels of land in the project area. The DEA recognizes two beach park lots the City & County of Honolulu’s Department of Parks and Recreation (DPR) own that may be developed in the future. However, there does not appear to have been an effort to coordinate with DPR regarding the project or alternatives. The State Department of Land and Natural Resources has responsibility for the shoreline and conservation resources, as well as the wildlife, in conjunction with NOAA and USFWS. Given the especially sensitive project setting including protected natural resources and wildlife, the expertise of the Department of Land and Natural Resources (DLNR) and the federal agencies (NOAA, USFWS) should have been tapped and fully integrated into the DEA. The DEA does not indicate, however, efforts to come up with a coordinated multi-agency solution to the driving factor that is causing the congestion and pedestrian safety concerns: the unfettered access of tourists to the beach and lack of crowd control or enforcement.	consulted, and their recommendations have been incorporated into the project's design and overall consideration throughout the duration of the development of the project. Early coordination with the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, the State Department of Land and Natural Resources , State Office of Planning and Sustainable Development (previously the State Office of Planning), the City and County Department of Planning and Permitting, the City and County Department of Design and Construction, and the City and County Department Parks and Recreation was used by the project team in the alternatives analysis, as discussed in Section 2.5 of the Draft EA. The scope of the environmental studies that were performed to support the alternative as proposed was also supported by these early coordination efforts.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	HDOT predicates this project on Hawaii's heavy reliance on tourism without considering the potentially destructive consequences of increasing accessibility to Laniākea. Without critical engagement of all of the agencies with co-management responsibilities for the area, the HDOT appears to have taken an overly narrow look at the issue of safety without considering the overall "integrated planning" elements of the root problem and a coordinated solution. Given the goal of Chapter 343 to integrate planning efforts and agency coordination, please describe HDOT's efforts to engage City, State, and Federal agencies in an integrated planning process and a multi-agency alternative that would take a holistic look at the natural resources implications of the realignment. The DEA does not mention the lack of restroom or shower facilities at Laniākea. With the increase in parking and visitors projected under the Pedestrian Shift Alternative, how will the thousands of visitors/users be accommodated in terms of restroom facilities? What are the implications of continued use of "bushes" as restrooms for thousands of people a day visiting the area? This section and the Water Quality section should address the implications of this continued and induced growth in visitors to the beach.	The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors or users of Laniakea Beach. DOT seeks to provide safe highway infrastructure for all users. The design is intended to accommodate the City and County Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. DOT has been coordinating with other agencies, but this is a transportation project. The following agencies were consulted, and their recommendations have been incorporated into the project's design and overall consideration throughout the duration of the development of the project. Early coordination with the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, the State Department of Land and Natural Resources , State Office of Planning and Sustainable Development (previously the State Office of Planning), the City and County Department of Planning and Permitting, the City and County Department of Design and Construction, and the City and County Department Parks and Recreation was used by the project team in the alternatives analysis, as discussed in Section 2.5 of the Draft EA. The scope of the environmental studies that were performed to define the alternative as proposed was also supported by these early coordination efforts.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	*3.7.2 Potential Impacts* The proposed alternatives that invite more tourists -- some of whom show a propensity to disregard state and federal mandates -- increases the likelihood of incidents involving harassment of Hawaii's endangered species. Discouraging visitor access to Laniākea can serve both concerns of safety and protection of wildlife. Imposing parking fees, limiting parking stalls, and stationing personnel to enforce parking restrictions -- in addition to the guard rails and crosswalk -- can deter people from crowding the area. Communication of limited parking near the beach can also alert drivers of the small likelihood of finding parking. Fewer numbers of people not only decrease the chance of wildlife harassment, it also makes it easier for park officials and watchful beach-goers to spot and chastise those who still attempt to touch the Honu or Monk Seals.	The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. With informal or non-designated parking, the number of cars anticipated to use the area would be similar to the existing condition. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors or users of Laniakea Beach. The State Department of Land and Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniakea Beach.
UH Manoa William S. Richardson School of Law	*Pedestrian Shift Alternative* The Pedestrian Shift Alternative (PSA) creates more parking for those accessing Laniākea Beach for recreational use (60 to 90 stalls). Recreational activities at Laniākea need to be surveyed and and analyzed before any project looking to accommodate an increase of human presence moves forward. The DEA does not consider the environmental impact of continued or increased recreational use of Laniākea without new mitigating procedures. The PSA creates the greatest potential for increased human activity at Laniākea. The shift moves parking	The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. With informal or non-designated parking, the number of cars anticipated to use the area would be similar to the existing condition. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors or users of Laniakea Beach.

Commenter	Comment	Responses
	from the mauka side of the highway to the makai side of the highway. The accessibility to Laniākea would likely increase tourist and recreational use of the beach. The PSA's effect on human activity extends beyond the more immediate accessibility of parking closer to the beach. The PSA "was designed recognizing . . . potential future park use." A "formal parking area" or added "beach amenities" – without new restrictions - would bring more people in contact with marine wildlife, which is a significant impact meriting consideration in an EIS.	
UH Manoa William S. Richardson School of Law	During the construction phase of the Pedestrian shift alternative, access to Laniakea Beach will be "more difficult" due to guardrail barriers being installed. The DEA acknowledges that access to the beach area will be temporarily "more difficult" and that this may "last for up to 24 months." The DEA reveals very little about the nature of the restrictions. This leads to the following questions: Can DOT elaborate on how difficult is "more difficult?" Will there be functionally no access to the beach area?	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible throughout the duration of construction.
UH Manoa William S. Richardson School of Law	In what ways could temporarily restricted access to the beach area affect different categories of recreational access from surfers, tourists wanting to view sea turtles, and local residents wanting to enjoy a nice day at the beach?	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to surfers, tourists, and local residents throughout the duration of construction.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	What would the construction entail? Could construction affect or impede beach users' enjoyment of the beach area even if they are able to access the area itself? Would there be significant noise, dust, and lighting issues that are common in construction areas? While it is noted that the wildlife in the area is accustomed to people, how will construction impact the wildlife, including the sea turtles, which are the area's main attraction for tourists and residents?	Section 2.4 describes the elements of the proposed project; construction mainly entails building the new road. Please see Section 3.16 for construction related issues. Section 3.16.5 specifically addresses construction impacts to biological resources such as turtles.
UH Manoa William S. Richardson School of Law	During the 24 month construction period, how will traffic be impacted in the construction corridor? How would parking be impacted?	There will be traffic impacts and there will be a traffic management plan to facilitate access to adjacent properties. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Please see Section 3.16.1 for details.
UH Manoa William S. Richardson School of Law	What effects will construction have on commute times for residents and tourists in either accessing the beach area or using that stretch of Kamehameha Highway to move to other parts of the island for work, school, and recreational activities?	Traffic management plans during construction will take into account rush hours, school hours, etc. to work with the community to limit delays. Construction impacts will be temporary in nature. Please see Section 3.16.1 for details.
UH Manoa William S. Richardson School of Law	How will construction impact pedestrian safety in the area?	Pedestrians near roadway construction always add another element related to site safety. The Contractor will establish their work area to provide a safe work zone and will exclude pedestrians from entering the location. Parking and beach access during construction will operate as current conditions with parking mauka of the highway and utilization of existing crosswalks.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	What agency would be in charge of regulating beach access both during and after construction? DLNR or the City? If so, has DOT consulted with them on a plan of action?	From a perspective of managing the coastal zone, the State Office of Planning and Sustainable Development (previously the State Office of Planning), the City and County Department of Planning and Permitting, as well as the Department of Land and Natural Resources' Office of Conservation and Coastal Land would oversee any development in the area. The City and County Department of Parks and Recreation and the State of Hawaii Department of Land and Natural Resources' Division of State Parks would manage any beach access and facilities. DOT has been coordinating with these agencies, but this is a transportation project. The design is intended to accommodate the City and County Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism.
UH Manoa William S. Richardson School of Law	Once the parking lot is constructed, what agency is responsible for maintaining the parking lot itself and establishing safety and security in the area?	The new informal parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. DOT will maintain the area as part of its right-of-way, but parking will continue to be at the motor vehicle owner's own risk.
UH Manoa William S. Richardson School of Law	*3.7.3 Avoidance, Minimization, and Mitigation Measures Pedestrian Shift Alternative* By supporting "ready access to Laniākea," the HDOT is not considering the impact increased access could have on Honu and other marine life. The DEA acknowledges that traffic and parking will be "temporarily limited for up to 24 months."	The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. Various agencies, including the U.S. Fish and Wildlife Service and the State of Hawaii Department of Land and Natural Resources were consulted and their recommendations have been incorporated into the project's design and overall consideration throughout the duration of the

Commenter	Comment	Responses
	How will traffic congestion, in an already very congested corridor, be impacted and what mitigation measures will be put in place to address that?	development of the project. Traffic management plans during construction take into account rush hours, school hours, etc. to work with the community to limit delays. Please see Section 3.16.1 for details.
UH Manoa William S. Richardson School of Law	Will any measures be taken to address impacts to parking?	The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Please see Section 3.16.1 for details.
UH Manoa William S. Richardson School of Law	Does DOT plan to implement mitigation measures to minimize impacts to parking and access to the beach, if any?	Access to parking will be available during construction as coordinated around the Contractor's work areas. Parking limitations will be temporary during the duration of construction of up to 24 months. Laniakea Beach will remain open and accessible to the public. Please see Section 3.16.1 for details.
UH Manoa William S. Richardson School of Law	During the construction phase, presumably residents and tourists would still cross the road to access the beach. What measures will DOT take to mitigate any additional pedestrian safety risks?	The Settlement Alternative will be in place which is beyond DOT's control. The Contractor will establish their work area to provide a safe work zone and will exclude pedestrians from entering the location. Please see section 3.16.1.
UH Manoa William S. Richardson School of Law	What measures would DOT take to mitigate noise and dust from a construction area that could disturb residents living in the area and interfere with visitors' enjoyment of the beach area?	Construction will result in short-term noise and dust impacts. Measures to mitigate noise and dust will be detailed further in construction documents and permits. Please see Sections 3.16.2 and 3.16.3 for details.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	After the proposed project is complete, while public safety may improve, what measures will be taken to manage the additional traffic of people and the impact that will likely have on the land and marine wildlife in the area?	DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land and marine wildlife that may result from their usage of the area.
UH Manoa William S. Richardson School of Law	Will DOT be coordinating with DLNR and DPR in the maintenance and management of beach resource access? If so, what plans are being considered?	From a perspective of managing the coastal zone, the State Office of Planning and Sustainable Development (previously the State Office of Planning), the City and County Department of Planning and Permitting, as well as the Department of Land and Natural Resources' Office of Conservation and Coastal Land would oversee any development in the area. The City and County Department of Parks and Recreation and the State of Hawaii Department of Land and Natural Resources' Division of State Parks would manage any beach access and facilities. DOT has been coordinating with these agencies, but this is a transportation project. The design is intended to accommodate the City and County Department of Parks and Recreation’s and other agency needs should they proceed with developing beach support amenities or managing tourism.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.8.1 Regulatory Requirements Laniakea is one of the most scenic coastal views from the highway along the North Shore. The DEA does not explain why only a brief visual impact assessment ("VIA") was conducted. Per the FHWA's Guidelines for the Visual Impact of Highway Projects this less detailed level of VIA is appropriate for assessing routine or minor projects. Please explain why the Project should be considered routine or minor.	The Visual Impact Assessment that was performed and developed for the project is appropriate for the size and scope of this project. There is an existing highway in the area; the project only proposes to shift it mauka by roughly 80 feet. There is no heighted element proposed that would result in a new visual obstruction.
UH Manoa William S. Richardson School of Law	The DEA also does not mention that a brief VIA was chosen in part, according to Appendix H, because "based on public engagement activities to date, there has been a low level of local concern regarding the project's visual components." However, it appears that not very many community members were consulted for the DEA, and Appendix H does not mention what concerns they had about the visual components of the Project. As such, the VIA might not accurately reflect community sentiment as opposed to assumptions by landscape architects and planners assume people would want. Given the scenic beauty of this particular area, the potential significant impacts of realignment and a new makai parking lot, and the obligations of all state agencies under Article XI, Section I of the Hawai'i Constitution to protect "natural beauty" ("Conservation and Development of Resources. For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty . . ."), the DEA should have conducted a more complete and detailed VIA.	The North Shore Community Development Plan represents the community's perspective regarding important visual elements along Kamehameha Highway in the North Shore area. The Visual Impact Assessment that was performed and developed for the project is consistent with the North Shore Community Development Plan. The level of study that was performed is commensurate with the size and scope of this project. There is no heighted element proposed that would result in a new visual obstruction.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.8.3 Potential Impacts Maintaining Rather than Improving the Aesthetic and Visual Impacts of the Project The main text of the DEA and Appendix H reflect a very conservative approach to the aesthetics of the Project. Of course, the VIA properly uses the existing appearance of the site as the baseline for determining the aesthetic and visual impacts of the Project. Yet, the finding that the Project alternatives generally have little impact on the visual character and quality of the area shows that the Project is not designed to improve the appearance of the area. Planners instead focused on maintaining its existing appearance. This is a lost opportunity to enhance the visual quality of the Project and the natural environment of a highly scenic and sensitive area.	DOT is replacing an existing facility and is not providing / creating any additional accommodations. DOT's focus is on creating and maintaining a safe transportation system; enhancing scenic views is generally outside their jurisdiction.
UH Manoa William S. Richardson School of Law	Maintaining the Scenic View Conflicts with Traffic Management and Safety The DEA notes that for both the TSM and the Pedestrian Shift Alternatives the scenic views “would still tempt drivers to slow down to enjoy the stunning sight of Laniākea Beach.” Drivers slowing down either to see Laniākea Beach from their cars or to park their cars to get out and view the beach are a main source of traffic problems in the area. Although both of these alternatives reduce the number of pedestrians crossing the road, they do little to solve the problem of slow, distracted driving in the area. Routing the highway farther inland would solve this problem and the interaction with the view by	The Most Alternative was considered but rejected as discussed in Section 2.5 and would not have resulted in a change in driver behavior as your comment suggests. DOT’s focus is on creating and maintaining a safe transportation system; enhancing scenic views is generally outside their jurisdiction.

Commenter	Comment	Responses
	drivers passing at a higher elevation, or a potential pullover for the viewplane, should have been analyzed.	
UH Manoa William S. Richardson School of Law	Revegetation and replanting In respect of the Pedestrian Shift Alternative, the DEA mentions at 3.8.3 revegetation and replanting efforts on both sides of the proposed roadway. No specifics are given regarding this portion of the project. No details are provided regarding the density, distribution and species composition of current vegetation and proposed revegetation.	Density, distribution, and the species composition of the proposed revegetation is part of the project's final design. DOT has guidelines that it will follow regarding the revegetation efforts for the project.
UH Manoa William S. Richardson School of Law	Please give further details regarding the density, distribution and species composition of the proposed revegetation and replanting.	Density, distribution, and the species composition of the proposed revegetation is part of the project's final design. DOT has guidelines that it will follow regarding the revegetation efforts for the project.
UH Manoa William S. Richardson School of Law	Who will be responsible for the revegetation and replanting?	Revegetation and replanting will be part of the construction contract. DOT will maintain this vegetation in accordance with the maintenance plan developed for the project.
UH Manoa William S. Richardson School of Law	What is the timeline for revegetation and replanting? How long will the revegetation and replanting process take? This timeline should be considered in the visual analysis.	Revegetation and replanting will be part of the construction contract. DOT has guidelines that it will follow as far as the timeline for plant establishment. The vegetation will not affect visual environment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Will such revegetation and replanting projects be protected from human traffic?	Revegetation and replanting will be part of the construction contract. DOT has guidelines that it will follow as far as the timeline for plant establishment which will include protecting the new plantings from foot traffic.
UH Manoa William S. Richardson School of Law	Will native species be used? Please note that native species may be required by State Highway landscaping laws and, if so, this should be noted and explained.	Density, distribution, and the species composition of the proposed revegetation is part of the project's final design. DOT has guidelines that it will follow regarding the revegetation efforts for the project.
UH Manoa William S. Richardson School of Law	Such information is required especially since at 3.8.3 it is mentioned that the proposed Highway will displace some of the vegetation, but this is not taken into account in the visual analysis given the assumption that the revegetation will replace such displacement. This information would be helpful as well to further supplement the claims that it would benefit erosion control and coastal ecosystems (see as well 3.18.1, 5.0 paragraph 10) and the overall visual impact (see Appendix H at 4.5.4).	The revegetation for the new highway area is different from the naturalization for the existing highway. Both areas will follow existing DOT guidelines regarding plantings. The Visual Impact Analysis assumes and discusses the construction of a new roadway. This construction will require the displacement of existing vegetation. The naturalization of the existing portion of Kamehameha Highway will result in the establishment of new vegetation in an area that is currently paved. Vegetation is anticipated to be low-lying typical of what is currently found along Kamehameha Highway in other areas and will not obstruct any view planes. Revegetation is generally considered an overall benefit to the coastal ecosystem and can be an important factor in erosion control.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Pedestrian Traffic Impacts to Visual Quality The main text of the DEA and Appendix H fails to address the impact of pedestrian traffic on visual quality for travelers and neighbors alike. As stated at 1.5.1, "200 to 300 pedestrians cross the [Kamehameha] Highway each hour from about 11:00am to 4:00pm to get to the beach from their vehicles." Thus, the population density at the site is substantial, and any alternative proposing to increase accessibility for pedestrians and motorists will likely obstruct and compromise the view even more significantly.	The EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars would be similar to existing accommodations. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of pedestrians at any particular location or the impacts to the visual environment that may result from their usage of the area.
UH Manoa William S. Richardson School of Law	The proposed Pedestrian Shift Alternative may create significant adverse impacts on visual quality by adversely affecting the sensitivity of neighbors and travelers. In Appendix H at 4.5.2, it is stated that "the size and scale of widened road, refuge median, guardrails, and other ancillary elements may impose slight adverse effects to motorists and a small number of commercial neighbors; however, the human and project environments will be orderly and coherent for neighbors and travelers." This conclusion is not supported by any explanation as to how "coherence and order" would be achieved.	The project as designed is intended to shift the existing Kamehameha Highway mauka by roughly 80 feet. The proposed project will reconstruct what is an existing condition. Coherence and order will be maintained because the elements of the proposed project are the same as the elements of the existing highway and visual environment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Furthermore, the fact that the new roadway and auxiliary features are “common” does not necessarily mean that a significant increase in size and scale would not negatively impact visual perception in this special area. The DEA should acknowledge that despite the desirability from an engineering perspective of “project orderliness and coherence,” a large new makai parking lot with 90+ cars constantly moving in and out, plus thousands of daily visitors on the beach, may detract from the beauty of this naturally scenic area.	References to the roadway and auxiliary features as "common" are intended to suggest that the scenic beauty of the area is already impacted by the presence of Kamehameha Highway. The slight increase in size and scale of the roadway's typical section is not sufficient to create a new negative visual impact. The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars would be similar to existing accommodations.
UH Manoa William S. Richardson School of Law	Construction Impacts to Visual Quality In Appendix H at 4.5.3, it is clearly stated that if the Pedestrian Shift Alternative is adopted, that there will be a negative visual impact as a result of the construction of the highway for 18 months, that “during the construction of this alternative, both neighbors and travelers could perceive that the visual quality of this project’s Area of Visual Effect (AVE) would be temporarily degraded.” However, these construction impacts are not mentioned in the visual analysis portion (at 3.8) of the main DEA document. Other than shielding of lights, there are no other construction-related mitigation measures with regard to the impacts to visual quality of the area (see Appendix H at 4.5.3).	Visual impacts during construction are temporary in nature and difficult to mitigate. Construction equipment must be present, and lighting may be used at times. Lighting is discussed in Section 3.16.5 because of considerations regarding wildlife.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Cultural Site The DEA and Appendix H gloss over the visual impact of increased highway lighting on Kahokuwelowelo Heiau, which is used at night to perpetuate traditional the Native Hawaiian knowledge and practice of wayfinding and star navigation. Appendix H notes that the number of viewers at the cultural site would be small and that new lights could be shielded to reduce glare at night. This approach seems to minimize the cultural significance of the practice and the need to avoid, not just mitigate, impacts.	The project noted in the Draft EA, Appendix H, that the views of the roadway from the site would be obscured by existing landforms and vegetation. The project does not minimize the cultural significance of the site by mitigating the visual impact of highway lighting. There were multiple alternatives rejected for this project (see Section 2.5) based solely on their impact to Kahokuwelowelo Heiau and other archeological and cultural sites. DOT's approach is to avoid impacts when possible and mitigate what cannot be avoided. The installation of streetlights is a necessary safety requirement.
UH Manoa William S. Richardson School of Law	3.8.4 Avoidance, Minimization, and Mitigation Measures *Pedestrian Shift Alternative* Appendix H states that a possible avoidance measure is adjustment to the proposed roadway alignment to avoid large trees, native plantings, or visually pleasing features: particularly adjacent to the Lauhulu Stream riparian corridor. There is no indication that the inventory for the VIA actually identified and located these aesthetic features that would possibly be impacted. Please provide the details for this analysis and conclusion.	The project has not yet reached the final design phase where the exact route is surveyed and can be adjusted. There are no large trees in the project vicinity, and 95% of the plants along the project corridor are alien to Hawaii. The inland side of the existing Kamehameha Highway is dominated by an overgrown forest of invasive tree species with weedy understory or open pastureland.
UH Manoa William S. Richardson School of Law	Section 3.9 Roadways and Traffic & App. B-Traffic and Pedestrian Circulation *Existing Conditions* The data used for this study were not comprehensive enough to provide significant conclusions as the data were only collected on two days. Although the DEA does attempt to show a difference between a Thursday and a Saturday, this is not enough to really show any	The report was prepared in accordance with industry standards. 24-hour data was obtained from HDOT. Travel time runs conducted for other projects along this corridor helped to determine the peak travel hours. Two consecutive weekdays of data were available, and the days were averaged. This is standard for locations without permanent traffic stations. The 24-hour data was supplemented with manual traffic counts during the

Commenter	Comment	Responses
	patterns. Data should be collected on all seven days during a week to give a full picture, for at least two weeks separated by a period of at least a month. At minimum, counts on Thursday and Saturday should be repeated on another week so that the DEA can provide an understanding of the conditions, particularly given that traffic and congestion are critical issues for the project.	weekday and Saturday periods. In addition, the existing conditions of backed up traffic and crossing pedestrians are well-documented by public input collected during project meetings, and in the form of newspaper articles and letters to the editor concerning this project.
UH Manoa William S. Richardson School of Law	The tables in this section are not easily understandable to the general public; acronyms like EB and WB should be spelled out. Table 2 describes parking related turns in the area, but it is not clear what exactly it is describing, as terms like "in" and "out" are used but not properly defined. Is this describing cars moving in from the road or the parking lot? A diagram would be helpful to accompany these charts. The data located in Appendix B are difficult to follow; adding table descriptions to the data tables to describe each column and row will make the data more digestible. Additionally, each table is referenced in the writing portion of the Appendix, therefore it might be helpful to give a detailed description of the variables and how they interact with each other instead of a cursory description of the data.	The text in the Traffic Evaluation (Appendix B) has been revised to add explanations to make the document more understandable to the general public.
UH Manoa William S. Richardson School of Law	This section states "2012 HDOT traffic counts at Chun's Reef (roughly 0.4mile northeast of the Laniākea Beach) were used to establish a baseline for Kamehameha Highway through traffic." Why is 2012 considered to the baseline for Kamehameha Highway through traffic in 2021? The concrete barriers were installed in 2013. This section should include a description of the historical	2012 data was the most current 24-hour data available at the time. It was supplemented by data collection before, during, and after the barriers were in place. Determining when visitors increased along with annual traffic counts would not impact the choice of alternatives.

Commenter	Comment	Responses
	context – when did the visitor at Laniākea increase, presented alongside annual traffic counts.	
UH Manoa William S. Richardson School of Law	After the tables, this section goes on to describe how “the hourly pedestrian crossing peaks were 242 pedestrian crossings per hour during the weekday afternoon (between 2:00 PM and 3:00 PM) and 338 crossings per hour during the Saturday afternoon (between 11:45 AM and 12:45 PM).” This data does not match Table 3, so it is not clear to the reader where these new data are coming from. Were these data collected in a different year so intended to be a comparison, or were these collected on January 16 and January 18, 2020 as well?	Table 3 illustrates the hourly pedestrian volume during the vehicular peak hour, while the text discussion presents the number of the maximum number of pedestrians during the peak pedestrian usage hour.
UH Manoa William S. Richardson School of Law	“A travel time that would normally be 10 minutes with no Laniākea Beach slowdown would take 11-12 minutes due to about 1-2 minutes of additional delay caused by the beach.” The observations of the class include many stories of being stuck in this traffic jam for at least 10 minutes, thus it is hard to understand this claim that the slowdown only causes 1-2 minutes of delay. Later on in this section, the actual data show delays ranging from 4-24 minutes. The sentence quoted above is misleading and should be edited for clarity.	The "actual" conditions being referred to is related to the longer beach-related delays observed on the weekend. The shorter delay times occur during weekday traffic.
UH Manoa William S. Richardson School of Law	Existing Conditions Analysis Methodology Please describe what Synchro and Simtraffic are. The general public does not understand what these words mean and how these applications were used to calibrate the data.	Appendix H has been revised to add descriptions of Synchro and Simtraffic.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Year 2030 Conditions Year 2030, the project's proposed build year, the plan does not take into full account the rapid acceleration in climate conditions. The DEA should utilize updated current information on 2030 conditions including how the City & County of Honolulu's new plans from the Office of Climate Sustainability and Resiliency can inform project design, potential impacts, and mitigation, and the DOT's recently released Climate Action Plan - https://hidot.hawaii.gov/wp-content/uploads/2021/07/HDOT-Climate-Resilience-Action-Plan-and-Appendices-May-2021.pdf	Section 3.1 of the Draft EA describes the geography and anticipated effects of sea level rise associated with climate conditions. Climate conditions and the project's impact extrapolated to 2050 and 2100 are presented in this discussion. The 2030 conditions in the transportation study are appropriate for understanding traffic volumes and conditions. Traffic volumes are directly influenced by population growth and land use. The burden of the model is to include assumptions that are reasonable and foreseeable relevant to the construction timeframe or planning horizon. A Climate Action Plan is only peripherally relevant as it has potential to influence land use, however, this is already accounted for in the reasonable and foreseeable land use development constraint. It is not necessary to explain this in the document as it is an understood professional standard in both transportation modelling and impact analysis.
UH Manoa William S. Richardson School of Law	Year 2030 Conditions Analysis Methodology Data used to analyze four alternatives are based on 2012 collection and depict a narrow data set. See comments under "Existing Conditions" regarding 2012 data. Is this method of data and prediction the best method for future conditions? What other factors are important to analyze related to road condition? Number and frequency of traffic accidents, pedestrian accidents, or close calls? Number and frequency of tour buses that contribute to traffic? Number and frequency of local vs non-local traffic?	The Purpose and Need for the proposed project were determined from a pedestrian traffic accident in August 2019. The future traffic condition was developed based on 2012 data, which was the most current 24-hour data available at the time. It was supplemented by data collection before, during, and after the barriers were in place. DOT does not discriminate between local versus non-local users of DOT facilities. Tour buses were observed but only as a producer of pedestrian crossings. The Traffic Evaluation documents the high volume of pedestrian traffic within this rural corridor. Local and non-local traffic are not separated.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Year 2050 Conditions Is a steady 1.0% growth rate over the course of decades an appropriate measure to use for the potential conditions at this specific scenic and heavily touristed area? Since the state reopened to tourism, despite the continued worsening of the pandemic, especially in Hawaiʻi, the numbers of tourists have skyrocketed past pre-COVID levels. Additionally, as developments and hotels continue to expand, it seems that a flat 1.0% growth rate is hopeful; with all these additions it would seem likely that growth rates of traffic will grow exponentially or might not hold steady at 1.0%.	The 1% growth rate was considered conservative based on historical traffic growth. Known developments in this area were also incorporated into this model.
UH Manoa William S. Richardson School of Law	Additionally, while no new developments are planned in the immediate vicinity of Laniākea, the issue is developments all around the island because this is a tourist attraction; if there is development growth and continued tourism growth elsewhere on the island, there will continue to be traffic and congestion issues even if no new houses or hotels are built between 2030-2050 in the surrounding area.	Yes, agreed, the number of tourists visiting Laniakea is mostly independent of development of the area near the project.
UH Manoa William S. Richardson School of Law	3.9.1 Existing Conditions See "As described in the Traffic and Pedestrian Circulation Study (Appendix B), pedestrian and vehicle data were collected several times over multiple years to analyze the impacts of both the previous barrier and to evaluate the proposed project." Please make the bolded text specific. Also add a general explanation on how data were estimated using predictions made from historical data and the 2035 Oahu Metropolitan Planning Organization (OMPO) model. Is this the best method and	Yes, the framework that is being used is appropriate for this proposed project. The use of historical data and the 2035 Oahu Metropolitan Planning Organization model is the standard for analyzing transportation demands. The layering of reasonable and foreseeable development in the model accounts for the anticipated impacts due to climate change.

Commenter	Comment	Responses
	appropriate framework for analyzing future trends and conditions taking into account climate change factors in Hawai‘i?	
UH Manoa William S. Richardson School of Law	Although useful to compare how conditions were affected by the inclusion of the barrier, it is also necessary to evaluate the situation from a larger perspective. How will climate change affect these areas? Will a road through this area be feasible if sea level rises to estimated heights? If not, how can we begin to redivert road traffic today as if the sea level was rising tomorrow?	The project is considered an interim solution for climate change/global sea level rise. Please see Section 3.1 of the Draft EA for details.
UH Manoa William S. Richardson School of Law	Section 3.10 Pedestrian Safety 3.10.1 Generally, Section 3.10.1 fails to present data that illustrate past and existing conditions concerning pedestrian-motorist related accidents and/or fatalities in the project area and along the North Shore stretch of Kamehameha Highway.	The Purpose and Need as described in Section 1 of the EA was determined from a pedestrian traffic accident in August 2019. The Traffic Evaluation documents the high volume of pedestrian traffic within this rural corridor.
UH Manoa William S. Richardson School of Law	The section lacks concrete, multi-year data concerning incidences of motorists striking pedestrians both in the project area and along the North Shore stretch of Kamehameha Highway. This data is important because it can be used to assess the purported need for “pedestrian safety” versus other needs that are perhaps more critical to the community, such as environmental and cultural resources of the area.	The Purpose and Need as described in Section 1 of the EA was determined from a pedestrian traffic accident in August 2019. The Traffic Evaluation documents the high volume of pedestrian traffic within this rural corridor. Pedestrian safety is a high priority for DOT. The project has been designed to avoid and mitigate potential impacts to environmental and cultural resources while creating a safer pedestrian environment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	This section briefly mentions the March 2021 technical report titled: "Traffic and Pedestrian Circulation Study,"1 which was conducted by consultants WSP Hawaiʻi Inc. The report (see Appendix B) presents general pedestrian and vehicle data collected over a few years, to assess the impacts of traffic congestion and travel time across the various proposed alternatives. Yet, the study does not directly assess pedestrian safety. For example, no data were collected concerning the number of "close calls" between pedestrians and motorists that may indicate the need for increased pedestrian safety, nor does it provide an estimation of the distribution of specific user groups who are causing the purported safety concerns in the project area (i.e., tourists, locals, etc.). In doing so, the "supporting" study is misaligned with the main asserted purpose of the project - pedestrian safety - which remains weakly supported by a single, tragic event of a motorist striking a pedestrian in the project area in August 2019.	The Purpose and Need as described in Section 1 of the EA was determined from a pedestrian traffic accident in August 2019. The Traffic Evaluation documents the high volume of pedestrian traffic within this rural corridor. Pedestrian safety a high priority for DOT. DOT recognizes that there is an inherent lack of safety measures in the vicinity of Laniakea Beach for pedestrians. Historical data is not the only means of determining a safe pedestrian environment.
UH Manoa William S. Richardson School of Law	The DEA should provide more detailed data to substantiate the main purpose of the proposed project and preferred alternative. This should also include data and discussion regarding pedestrian-motorist accidents and fatalities on Oʻahu, the North Shore area specifically, and nearby stretches of Kamehameha Highway - to present a more complete picture of the scope of the issue and to better articulate the need as being one supported by data.	The project area is located in the vicinity of Laniakea Beach. DOT recognizes that there is an inherent lack of safety measures for pedestrians in the vicinity of Laniakea Beach, which is a unique resource and tourist destination. The evaluation of the entire North Shore is beyond the scope of this project.
UH Manoa William S. Richardson School of Law	Furthermore, additional data should be collected, presented, and analyzed to determine which user group(s) are historically and presently contributing the most to pedestrian-motorist conflicts. This nuanced analysis may change the consideration of the alternatives. Moreover, mitigation measures based on this user data	DOT has responsibility to provide a safe transportation system for all users. Data regarding which user groups are involved in pedestrian-motorist conflicts would not affect the selection of the Pedestrian Shift Alternative as the preferred

Commenter	Comment	Responses
	should be incorporated into the analysis of all proposed alternatives	alternative. The Pedestrian Shift Alternative also fulfills a secondary purpose of roadway resilience.
UH Manoa William S. Richardson School of Law	The DEA does provide general estimations of the amount of pedestrian foot traffic in the project area, for example, describing how “as many as 338 pedestrians cross[] the road [in the project area] during a single hour on [any given] Saturday afternoon.”2 However, the DEA lacks any specific data or estimation regarding the make-up and distribution of user groups who (1) illegally park in the mauka parking lot; and (2) illegally cross the Highway during “peak”periods (posing the main pedestrian-motorist risk). This specific data is critical to understanding, and thus constructing mitigation measures, that provide for pedestrian safety in the project area. For example, if the majority of illegal crossings in a “peak” period are by tourists illegally parking and/or stepping out of tourist’s busses/shuttles - then specific mitigation measures should be formulated to target the safety concerns that those user groups pose. Like all management strategies - the solutions, and their supporting data, should be both place-based and stakeholder/user-group informed. Here, if after further study it is determined that tourists are presenting the main pedestrian safety threats and concerns, then the subsequent proposed mitigation measures should be targeted to address those specific problems across all proposed alternatives. Expanding a tour bus ban to all proposed alternatives is one option. A visitor permitting system with limits3 is another tailored mitigation measure that may be considered. A complete realignment and unfettered access to expanded parking	DOT does not manage the number of visitors to any particular location or the impacts to the land that may result from their usage of the area. DOT has responsibility to provide a safe transportation system for all users. Data regarding which user groups are involved in pedestrian-motorist conflicts would not affect the selection of the Pedestrian Shift Alternative as the preferred alternative. The Pedestrian Shift Alternative also fulfills a secondary purpose of roadway resilience.

Commenter	Comment	Responses
	may not be the best solution when the precise problem is not well analyzed.	
UH Manoa William S. Richardson School of Law	Section 3.11 Public Facilities Section 3.11 regarding Public Facilities appears to be lacking in breadth and depth. The purpose of this DEA is to address pedestrian safety, the shoreline erosion, congestion, and reliability of highway operations within the project limits. Within section 3.11, many of these categories are absent in discussion and analysis. Analyses on the important facilities that may be affected are absent. The DEA should include more information on how there may need to be new facilities implemented due to the proposed parking lot, as outlined by the preferred Pedestrian Shift Alternative.	The design is intended to accommodate the City and County Department of Park and Recreation's needs should they proceed with developing beach support amenities. The existing facilities are minimal and are not under the jurisdiction of DOT.
UH Manoa William S. Richardson School of Law	3.11.1 Existing Condition This section of the DEA demonstrates a cursory coverage of impacts to facilities available in the vicinity of Laniākea beach. It is noted that homes in the project area are served by public utilities (water, electricity, sewage) and private utilities (Hawaii Telecom, Hawaii Electric Company) with further acknowledgement towards the extra burden placed on the lifeguards at Laniākea who are required to act as first responders to incidents at the beach due to the distance of the nearest emergency services (Waialua Fire Station) and the traffic congestion observed along the road. Nowhere in this section are any other public facilities and services in the area, such as public bathrooms, showers,	DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population growth. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land that may result from their usage of the area. The design is intended to accommodate the City and County of Honolulu Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities.

Commenter	Comment	Responses
	or rubbish bins, addressed. Are there currently any of these facilities at the site? If so, what is their current usage rate and maintenance status? This seems like important baseline knowledge to convey so that we may better understand how increased visitor traffic to Laniākea as a result of this project may affect the use of these types of facilities. The draft points out that there is only one lifeguard tower at the beach, but the rest of the section does not address how increased traffic to the beach will impact the capacity of the lifeguards at the site. Will more lifeguards be stationed in the area to handle the anticipated increase in visitors? Already the lifeguards on O'ahu have had to limit coverage due to expanded hours; how will adequate coverage be assured and is coverage for a larger tourist crowd at Laniākea "fair" given high usage in other areas of the North Shore?	
UH Manoa William S. Richardson School of Law	3.11.2 Potential Impacts Pedestrian Shift Alternative According to this alternative, moving the highway inland would keep it open during high surf, which helps further one of the project's purposes of improving roadway reliability. This alternative would reduce congestion and allow easier passage of emergency vehicles, both of which further the project's purposes of congestion and roadway reliability. According to the draft, "water meters, utility poles and sewer manholes would remain accessible for maintenance along the currently existing highway," and no changes to the utilities are anticipated. However, the draft does not address how shoreline erosion may affect	These utilities are owned by other entities and are not under DOT jurisdiction. DOT has been in coordination with utility owners and providers to ensure continued services to the area.

Commenter	Comment	Responses
	these utilities that remain along the existing highway. Given that one of the secondary reasons for this project is to address impacts of shoreline erosion to the currently existing highway, how will public utilities along the old highway be protected or mitigated from weather and erosion impacts?	
UH Manoa William S. Richardson School of Law	As mentioned previously regarding Section 3.11.1, if there are public facilities such as public bathrooms, showers, and rubbish bins at the beach, this draft does not address any of the potential impacts to those facilities that increased visitor traffic may result in. If there currently are no such public facilities such as public restrooms or trash bins available in the area, this seems like a major concern given that the project would increase visitor access to the beach.	There are no restrooms or similar public facilities on site. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land that may result from their usage of the area. The design is intended to accommodate the City and County of Honolulu Department of Parks and Recreation's and other agency needs should they proceed with developing beach support amenities.
UH Manoa William S. Richardson School of Law	There is a lack of discussion with how electricity consumption rates might change with this alternative's proposal to install new poles for lighting every 120 feet along the highway. Currently, electricity and telephone/cable lines are on poles that also provide highway lighting (3.11 Public Facilities and Services). With this alternative's proposal to install new poles for lighting along the mauka side of the highway, how will this impact the existing poles which have lighting,	The poles are replacing existing poles so there will be no net change in electricity consumption. Lighting will be shifted to the newly realigned Kamehameha Highway on the mauka side of the proposed highway and lighting will no longer be provided along the existing Kamehameha Highway. The currently poles will continue to exist in-place for the co-located utilities.

Commenter	Comment	Responses
	electricity, and telephone/cable lines attached to them. Will the new poles interfere with the current poles?	
UH Manoa William S. Richardson School of Law	According to this section, “[n]o changes to utilities serving this area would be made.” One of the components of this alternative is to improve drainage (2.4 Pedestrian Shift Alternative). This portion of the draft does not address how the drainage system will be affected or improved. Rather, this section says that “[n]o changes to utilities serving the area would be made.”	Stormwater drainage is generally referred to as a feature of the roadway facility. The stormwater system has been designed as a low-impact permanent best management practice that allows for stormwater infiltration rather than a storm sewer system.
UH Manoa William S. Richardson School of Law	3.11.3 Avoidance, Minimization, and Mitigation Measures Pedestrian Shift Alternative The DEA mentions a plan for implementing “access controls at Pohaku Loa Way to prevent the private road from being used as overflow parking for beach access, as well as to discourage inadvertent motorized uses of the shared-use path.” How will that overflow control be monitored and enforced?	DOT will install a gate at the end of Pohaku Loa Way. Enforcement will be managed through coordination with the Honolulu Police Department.
UH Manoa William S. Richardson School of Law	As mentioned previously regarding Section 3.11.2, it sounds like leaving public utilities along the old highway will not protect those utilities from the effects of shoreline erosion. The reliability of the public utilities if they are left along the old highway needs to be addressed in the assessment.	Public utility companies are monitoring this issue throughout the state. The project team agrees with this observation. However, these utilities are owned by other entities and are not under DOT jurisdiction. DOT has been in coordination with utility owners and providers to ensure continued services to the area.
UH Manoa William S. Richardson School of Law	One component of the project is removing the makai lane of the original highway and revegetating it (2.4 Pedestrian Shift Alternative). However, potential impacts to the utilities along the original highway during the lane removal and revegetation should be addressed in the assessment.	Lane removal and naturalization can be completed without impacting utilities. DOT has been in coordination with utility owners and providers to ensure continued services to the area.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.15 Social and Economic Conditions This section highlights how HDOT's Title VI Plan (2019) was designed to fulfill its responsibilities under nondiscrimination regulations and directives. HDOT uses detailed race categories to treat people of different national origins equitably in highway planning, programs, and activities. This information is helpful when thinking about the impacted community and how to integrate Environmental Justice into this project. The Kawailoa Census Tract, which includes the project area, is compared and contrasted with the population, demographics, and socio-economic conditions of Hawaiʻi and Honolulu County. Given the disparity in Median Household Income by Household and Median Structure Value, how does the project plan address this? Do the U.S. Census Bureau (2017) characteristics include average lot size for the Kawailoa Census Tract compared to Hawaiʻi and Honolulu County? Are the Kawailoa Census Tract numbers different from other areas because of the increased tourism caused by Laniākea Beach? How many people living in the Kawailoa Census Tract commute to and from Honolulu, and at what frequency? More information would be helpful for the reader to grasp the state of the community and the context in which it exists.	More information regarding the project area with this information would not impact the choice of the preferred alternative. The Draft EA contains an appropriate level of analysis based on the benefits that would be provided to the immediate and adjacent communities with the construction of the proposed project. No further analysis is warranted.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	The section concludes by stating that impacts on air and noise will be temporary and are outweighed by the "benefits" of a safer roadway and "overall enhancement to the quality of life," which seems like an overall generalization when considering that the project will attract more tourists than ever before which will likely not benefit the quality of life for North Shore residents. There are also no plans to mitigate the social and economic conditions that will change with this project. In this draft, it would be helpful to indicate how North Shore residents will be affected by the increase in tourists and any plans to mitigate overcrowding at the beach.	This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT's focus is transportation, mitigation of tourism is outside of their jurisdiction. The design is intended to accommodate the DPR's, and other agency needs should they proceed with developing beach support amenities or managing tourism.
UH Manoa William S. Richardson School of Law	3.16 Construction Impacts 3.16.1 Maintenance of Traffic and Parking This section addresses the impact to motorists traveling along Kamehameha Highway if they choose to move forward with the Pedestrian Shift Alternative. The whole project will take a total of 24 months to complete, and the DOT plans to install proper signage on the streets around Laniākea and establish communication methods with the Laniākea and North Shore communities. However, given that the project schedule is expected to continue over the next 24-months, the DEA fails to address where tourists and locals alike can park and access Laniākea. In Sections 3.9 and 3.10 Roadways, Traffic and Pedestrian Safety are addressed, but only in regards to before and after the completion of the project, and not during construction.	The contractor may have to block parking for limited amounts of time for safety at an active construction site. Parking in the dirt area across the highway during construction cannot be guaranteed but access the beach will still be available. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. No additional parking facilities will be provided. The design is intended to accommodate the DPR's, and other agency needs should they proceed with developing parking, beach support amenities or managing tourism.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	A construction site will not deter tourists from seeking out turtles at Laniākea, and their cars will congest the local communities and streets in the surrounding areas. What measures will be taken to keep pedestrians safe during this time? Are these side streets maintained enough to support the increase of cars, people, and traffic during this construction period? Will the local residents be given parking permits to ensure that they have street parking near their own homes?	No additional parking facilities will be provided. During construction, DOT's contractor will manage site safety. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency. There are no existing public side streets within the project area; Pohaku Loa Way is privately-owned.
UH Manoa William S. Richardson School of Law	This is also a rural community, so how will traffic affect emergency service times? These are questions that need to be considered and answered that the DEA fails to adequately address. Although the Laniākea project will not conduct continuous work activities around the clock, these are still things that need to be considered and planned for, especially for a 24-month project.	Construction plans will include Maintenance of Traffic Plans and DOT will coordinate with emergency service providers in the development of these plans.
UH Manoa William S. Richardson School of Law	3.16.4 Water Resources In compliance with the constitutional mandate under the Public Trust Doctrine, the DEA, as prepared by the DOT, should ideally demonstrate the State's fulfillment of its affirmative constitutional duty to protect water resources. We contend, however, that the DEA still lacks detailed considerations with respect to the protection of water resources. To note, we identified two potential impacts to water resources, as mentioned in Section 3.16.4, that merits further assessments and analysis as follows: (1) Section 3.16.4 states that limited access during construction will "require parking in other locations than the informal area on the mauka side of the Highway where people now park." The DEA does not provide any details in terms of alternative parking sites during	Access to parking will be available during construction as coordinated around the contractor's work areas. As noted in Section 3.16.1, traffic control plans will be developed based on the contractor's phasing to minimize traffic and access issues to adjacent properties. The concerns expressed in your comment regarding water quality created by unregulated parking and access already exist and would not be exacerbated by the proposed project.

Commenter	Comment	Responses
	construction. We would have expected the DEA to further specify alternative parking areas and an assessment whether those alternative sites would pose any impacts to water resources. Further, the DEA should identify alternative routes that would enable safe access to Laniākea Beach. Unregulated parking and access routes during construction could inadvertently impact water resources in the event that irresponsible people choose to create an alternative path that is harmful to water resources.	
UH Manoa William S. Richardson School of Law	(2) Section 3.16.4 acknowledges that the project contractor will obtain the required permits through the NPDES program and noted several construction best-management-practices ("BMPs") that would minimize sedimentation and improper waste disposal. We are concerned that the DEA, in its current form, discusses BMPs in generalities, and that the DOT is merely relying on the representations made by the project contractors. As previously noted, the State has an affirmative duty to protect water resources pursuant to the Public Trust Doctrine, which includes the duty to monitor the practices of third parties. We, therefore, urge the DOT to provide additional details and assurances that the identified BMPs will provide sufficient protection of water resources from construction impacts.	As stated, the project will have an National Pollutant Discharge Elimination System permit which will have detailed best management practices (BMPs). It is inappropriate to try to determine exact BMPs and their location and management until the design is completed. The State of Hawaii Department of Health Clean Water Branch will not issue a Notice of General Permit Coverage without being assured that the identified BMPs will provide sufficient protection of water resources from construction impacts. DOT is well aware of their agency's obligations and duties to protect our state's water resources.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.16.5 Biological Resources Section 3.5 of the Draft EA describes various plant and animal species found in the area. For example, the DEA lists the dominant vegetation types, plant and wildlife habitats, and key animal species including native birds, bats, and turtles. Unfortunately, the construction impacts on most of these species and habitats are not similarly addressed in section 3.16.5. Section 3.16.5 only addresses impacts on wildlife without any discussion as to how construction of the Project might impact native species in the area, nor how construction can enable the spread of invasive species. For example, clearing invasive tree species (e.g., cutting off tree branches) to make space for the construction site might indirectly disperse seeds or pollen into areas outside the construction site. Construction equipment used in other sites may bring in invasive species (e.g., toxic devil weed that is a serious problem in mauka areas of the North Shore).	The Draft EA in Section 3.16.5 includes and addresses the animal species that could be impacted by construction and includes avoidance measures. Controlling importation of invasive plants and animals is a standard part of construction documents and contractor requirements. The Final EA has been revised to include more of these standards that will mitigate potential impacts regarding invasive species and wildlife found in the project area.
UH Manoa William S. Richardson School of Law	A deeper discussion on construction impacts on indigenous bird species is also merited because of the Project’s large geographic coverage and specific location. Some indigenous bird species found in the area include migratory shorebirds like the Pacific Golden Plover (Pluvialis fulva) and the Ruddy Turnstone (Arenaria interpres). Seabird species include the Wedge-tailed shearwater (Ardenna pacifica, also known as Uau Kani), the endangered Hawaiian Petrel (Pterodrama sandwichesis), and the threatened Newell's Shearwater (Puffinus auricularis newelli).	Please see Appendix E for a more in-depth discussion of bird species in the area. Lighting impacts would be the main concern that could impact some of these bird species during construction and are addressed in Section 3.16.5.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	While Section 3.16.5 does discuss efforts to minimize construction lighting impacts on these species, that is the extent of the analysis. The DEA lacks any examination of other potential impacts, such as how construction noise might interrupt nesting patterns or interspecies communication, nor how the physical presence of construction equipment might scare or otherwise dissuade these species from being in their natural habitat area. These impacts are important because these species are native and/or listed as threatened or endangered under Section 7 of the Endangered Species Act. Any effects on how construction activities and the new makai parking lot might affect or displace these species should be considered in light of these legal protections.	The level of discussion in the EA is appropriate for a small construction site. As discussed in Appendix E, it is recommended that a preconstruction nest survey be conducted to confirm that there are no pueo nesting in the area prior to any vegetation clearance. The project will comply with this recommendation. No species protected by Section 7 of the Endangered Species Act were observed in the project area or are known to nest there. The project area is comprised of a busy highway and existing uses include an operating ranch that could disrupt any use by these bird species. The existing environment is not quiet.
UH Manoa William S. Richardson School of Law	Lastly, while it is important to identify construction impacts that directly affect individual species, it is also critical to examine any negative effects construction might have on larger habitats and ecosystem zones as a whole. For example, Section 3.16.5 should provide a discussion on how construction activities might affect: the food, water, or other resource availability for the species already described, any intrusions on physical habitat (e.g. clearing trees or branches may disrupt nesting sites), the connectivity between habitats, and any alterations to habitats that may make them more vulnerable to natural predators, humans, natural phenomenon (e.g. vulnerability to extreme weather events), and climate change. A broader look at how construction activities influence the overall health of the larger habitat ecosystem will	The level of discussion in the EA is appropriate for a small construction site. Please see Appendix E for a general overview and description of the biological environment. It is noted that 95% of the plant species are alien to Hawaii and no threatened, endangered, or species of concern were found in the project study area. The project area is comprised of a busy highway and existing uses include an operating ranch that already disrupts the physical habitat.

Commenter	Comment	Responses
	ensure this project does not sacrifice the integrity of the flora and fauna of the area.	
UH Manoa William S. Richardson School of Law	3.16.6 Solid Waste Management and Hazardous Waste In 3.16.6 the DEA outlines the requirements for contractors. However, the DEA fails to address the possibility of their requirements not being met, and any fines or consequences the contractor will face if they do not follow procedures. Laniākea is a sensitive coastal and beach habitat. Even if road sites under construction follow all procedures, it is simply not enough to keep up with the rubbish and nuisance that these sites emit including: napkins, plate lunch plates, dirt, odor, and dust. With the beach and Honu present in the vicinity of the Project area, it is imperative that HDOT goes above and beyond the regular scope of procedures to make sure that the project site does not contribute to the degradation of the local ecosystem. How will this be monitored and enforced?	These requirements will be specified in the contract documents, including the specifications. DOT is experienced with contracts for road construction and has inspectors that will visit the site to enforce compliance.
UH Manoa William S. Richardson School of Law	Has the Department asked any help from federal agencies or other state agencies who have a stake in protecting beaches and endangered wildlife from solid or hazardous waste? These are all missing parts of the analysis that is not included in the DEA.	DOT has been coordinating with other agencies that have a stake in protecting beaches and endangered wildlife for approximately ten years. Impacts to endangered wildlife due to hazardous waste or materials during construction has not been a concern expressed by regulatory agencies.
UH Manoa William S. Richardson School of Law	In 3.13.1, the DEA addresses hazardous waste for the Project, but also fails to specifically address mitigation efforts if hazardous materials will affect the ecosystem. The negation of these potential impacts merits further consideration that should be addressed before Project work commences.	Requirements related to spills and other hazardous waste will be specified in the contract documents. Hazardous waste is not expected at the site. The previous and continued land use of the project area does not commonly generate hazardous waste. If the contractor encounters anything unexpected, there are procedures in place for DOT projects.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.17.1 State of Hawaii Plans and Land Use Controls *Hawaii State Plan Transportation Functional Plan* "This project would address congestion, one of the four issues considered most critical in the plan" 3.17.1 at 3-53. The document admits in section 3.18.1 Potential Secondary Impacts that "By creating safer access to the beach, more tourists may come, and add to the pressure placed on resting turtles and coastal resources . . ." How would the project address traffic congestion if there is no discussion about the reason why there is increased traffic in the first place, which are the turtles and other wildlife?	The design is intended to accommodate the City and County of Honolulu Department of Park and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land and marine wildlife that may result from their usage of the area.
UH Manoa William S. Richardson School of Law	The Pedestrian Shift Alternative (PSA) projects an estimated capacity of 90 cars, up from the 50-60 car capacity in the no-build alternative. A potential impact of increasing accessibility to the beach will likely be a greater number of tourists and visitors to Laniākea. As traffic congestion is one of the four issues considered under this plan, how would the PSA continue to minimize congestion once all 90 car parking spaces are full? Once all spaces are occupied, what prevents additionally bottlenecking along the proposed relocated highway, resulting in traffic and delays? Increasing accessibility may provide safer access to the beach, however, would seem to still run a risk for congestion.	The design is intended to accommodate the City and County of Honolulu Department of Parks and Recreation's needs should they proceed with developing beach support amenities. The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars using the area would be similar to existing accommodations. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	*Hawaii 2050 Sustainability Plan* *"The Hawaii 2050 Sustainability Plan, July 2021 (Hawaii State Plan), prepared pursuant to HRS 226-65, serves as strategic action plan for climate and sustainability for the next ten years (2020- 2030)."* The DEA briefly mentions consistency between the goals of this project and the eight focuses of the Hawaii 2050 Sustainability Plan. Of the eight focus areas listed under this plan, two focus areas--number three (Improve Climate Resilience) and seven (Preserve the Natural Environment)--seem most applicable to this proposed project. With the anticipated increase in number of visitors to Laniākea beach with the suggested increase in accessibility to the beach this project would provide, what considerations are in place to minimize human effects on coastal erosion and overall human impact to the beach? How is this plan increasing the resilience of the shoreline against human traffic, litter, and erosion apart from coastal revetment?	The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project.
UH Manoa William S. Richardson School of Law	Natural resource protection is one of the eight focus areas under the Hawaii 2050 Sustainability Plan. Although this project theoretically increases safe accessibility to theshoreline, it does not address any safety measures regarding the impact of the increase in visitors to the shoreline on the local marine ecosystem and wildlife (resting Honu and other wildlife in the area). What measures will this project take to protect the natural local ecosystem against a greater number of visitors to the beach?	The design is intended to accommodate the City and County of Honolulu Department of Park and Recreation's and other agency needs should they proceed with developing beach support amenities or managing tourism. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach

Commenter	Comment	Responses
		has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land and marine wildlife that may result from their usage of the area.
UH Manoa William S. Richardson School of Law	*Coastal Zone Management, Chapter 205A-2 of the Hawaii Revised Statutes* Coastal Ecosystems: "The Pedestrian Shift Alternative would not only protect coastal ecosystems, it would benefit them by reducing and scaling back urban encroachment." 3.17.1 at 3-56. How does increasing the amount of parking available from 50-60 spaces to 90 spaces, moving the parking closer to the coastal zone, and increasing the amount of people visiting Laniākea protect and benefit the coastal ecosystems? How will the Pedestrian Shift Alternative reduce and scale back urban encroachment? This alternative seems more likely to encourage people to come and visit this area, which will actually increase the amount of development that will happen in this area. Companies are more likely to increase building and urban encroachment in order to take advantage of the better road infrastructure and tourists that will be visiting.	The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars accessing the area would be similar to existing accommodations.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Managing Development and Public Participation: "The Pedestrian Shift Alternative has been developed through public participation. As discussed in Section 2.4 and Section 2.5, it is largely based on the Quinlan Realignment Alternative, which was strongly advocated by the community . . .HDOT met with residents at Pohaku Loa Way, residents on the Haleiwa side of Laniākea Beach, Kamehameha Schools, the City DPR, and local ranchers to develop the Pedestrian Shift Alternative design." 3.17.1 at 3-56 and 3-57. How many community members advocated for the Quinlan Realignment Alternative? Were those community members that advocated for the Quinlan Realignment Alternative the same community members that HDOT met with at Pohaku Loa Way and Haleiwa? How many residents were consulted at Pohaku Loa Way and Haleiwa? Were the residents' input, comments, or concerns incorporated into the Pedestrian Shift Alternative?	Yes, the residents' concerns were incorporated into the design of the Pedestrian Shift Alternative. All adjacent property owners were invited to public meetings regarding the project alternatives in 2018 and then again in 2019. Approximately 12 residents were consulted at these meetings held for residents, but they were also consulted as part of the larger community. The exact number of community members who advocated for the Quinlan Alternative, which was originally presented by the Task Force to DOT at a project meeting in 2013, is unknown as no formal poll was taken. There may have been some overlap with the residents and the supporters of the Quinlan Alternative. The design of the project has been refined based on input from Kawailoa Ranch and Kamehameha Schools / Bishop Estate as the lessee and landowner of the property the project would impact.
UH Manoa William S. Richardson School of Law	Marine Resources "The pedestrian shift will have no adverse impact on marine resources" and "revegetation would benefit the coastal ecosystem." There should be more explanation to these conclusive statements. How will the project not have an impact on marine resources? How will this project benefit the coastal ecosystem?	The project will move cars and any associated potential pollutants further from the marine environment. Half of the pavement from the existing highway will be removed and the area will be naturalized. The removal of this section of pavement will allow for more stormwater to be absorbed before entering the marine environment.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	3.17.2 City and County of Honolulu Plans and Controls *North Shore Sustainable Communities Plan* This section discusses how the proposed project would keep Kamehameha Highway as a two-lane highway consistent with the region's rural character and rural lifestyle. However, it seems that with an increase in the parking space this will increase the amount of traffic on the highway. How will the project keep the highway consistent with the region's rural character, especially if it is widened and improved on, and with the increased capacity for tourists in this area? This seems as though it will encourage more people to use this part of the highway and visit Laniākea, creating additional congestion.	The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars accessing the area would be similar to existing accommodations. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project.
UH Manoa William S. Richardson School of Law	The Department of Planning and Permitting's consultation letter, in Appendix A-1 pg. 145, states this Draft EA "should disclose how the various project alternatives will be consistent with Hawaii Revised Statutes Section 205A-2 and Chapter 25, Revised Ordinance of Honolulu (ROH)." On this note, to be completely transparent with the public and those that are involved with this project, the Draft EA "should identify any significant adverse environmental or ecological effects and specify which elements of the Project would be considered "development" for purposes of Section 24-1.3, ROH." The DEA does not appear to address these concerns. The DEA seems to ignore or only superficially cover the fact that this is a State Conservation District. More discussion is needed	After the Draft EA is finalized, it will be used to support the Special Management Area Use Permit Application as required. Section 3.18 of the Draft EA is explicit in identifying the Certified Shoreline, which delineates the Conservation District from the Special Management Area. Figure 3-15 of the Draft EA illustrates elements of the project that would be considered "development" based on their relationship to the Certified Shoreline. The discussion as presented in the Draft EA is adequate for the level of analysis required.

Commenter	Comment	Responses
	regarding the secondary and cumulative impacts on that conservation district.	
UH Manoa William S. Richardson School of Law	3.18.1 Potential Secondary Impacts The DEA fails to quantify secondary impacts on Honu and other endangered species such as Monk Seals. HDOT claims "[t]here is no way to reasonably quantify" the secondary impact on the project on these species. HDOT has already estimated the current number of vehicles that park on the mauka side of the highway during peak hours at fifty to seventy and the number of pedestrians that cross the Kamehameha Highway fronting Laniākea Beach every hour from 11:00 AM to 4:00 PM at 200 to 300 people every hour. (See 1.5.1). HDOT knows their proposed Pedestrian Shift Alternative will create ninety (90) new parking spots for vehicles and will allow a safe area for tourists to alight from buses. Based on the current trend of 200-300 pedestrians per hour crossing over from the current mauka side parking lot five hours a day, one could predict that the preferred project will increase the number of tourists visiting the sea turtles by fifty percent based solely on the increased number of parking spots. HDOT can also estimate the number of tourists that tour buses would drop off at the new parking lot using current tour bus data. Even estimating only one bus every thirty minutes, the preferred pedestrian shift alternative could increase the number of tourists travelling to Laniākea to see the sea turtles by at least 100% (400-600 per hour).	The Draft EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars would be similar to existing accommodations. The design is intended to accommodate the City and County of Honolulu Department of Parks and Recreation's needs should they proceed with developing beach support amenities. DOT is replacing an existing facility and is not providing / creating any additional accommodations. This project is not intended to change the existing usage of Laniakea Beach because its usage is determined by tourism and general population. The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land and marine wildlife that may result from their usage of the area.

Commenter	Comment	Responses
UH Manoa William S. Richardson School of Law	Although most tourists respect the Federal laws protecting these endangered species, there will always be a few who ignore them and harass and molest these majestic animals. Even if just one percent of the total visitors violate these laws, any project that proposes to increase the number of visitors to Laniākea Beach will increase the number and frequency of illegal interactions with the protected species that use Laniākea Beach. For these reasons, HDOT’s assessment in 3.18.1 stating their inability to quantify the secondary impact on the Sea Turtles at Laniākea beach should be reevaluated.	The use of Laniakea Beach has grown and is anticipated to continue to grow regardless of this project. DOT does not manage the number of visitors to any particular location or the impacts to the land and marine wildlife that may result from their usage of the area. The State Department of Land & Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniakea in order to prevent a spike in tourist harassment.
UH Manoa William S. Richardson School of Law	App. A-1 Pre-Scoping (agencies, officials) We acknowledge and appreciate the DOT’s exhaustive recipient list of Federal, State, and County agencies, elected officials, organizations, and stakeholders who received correspondence regarding the scoping request in preparation of the DEA. Only a minority of the recipients submitted a response to the DOT’s scoping requests (around 35 responses received out of approximately 100-plus recipients). Given the importance of this project and its controversial history, DOT should continue community engagement and consultation activities through the remainder of the environmental review process, especially outreach to residents and community members who will be most impacted by this proposed Project. The distribution of a single email or letter correspondence to a select group of individuals or entities may meet the minimum but does not constitute meaningful community outreach. The intent of the public records and notice requirements under HRS 343-3 is to embrace public comments to help	Yes, DOT outreach to residents and community members most impacted by this project has been a hallmark of DOT's project development approach. This outreach effort has consisted of multiple meetings and conversations that have led us to a project that is a compromise for all and a solution to a complex problem. The formal correspondence as included in the EA is a procedural requirement. The response rate to these formal letters doesn't always reflect the true engagement that occurs between DOT and agencies, elected officials, and community members. Section 1.4 summarizes the project's ten year-long history, which far exceeds the minimum requirements for project outreach.

Commenter	Comment	Responses
	inform the State and applicants of environmental concerns. To upholds the spirit of meaningful community outreach as expressed in HRS Chapter 343, and to help overcome a history of community skepticism about DOT's project planning processes, DOT should strive to exceed the minimum requirements provided under the law.	

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

April 1, 2019

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 14, 2021

LD1027e

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
X Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: rubyrosa.t.terrago@hawaii.gov)*
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
X Office of Conservation & Coastal Lands *(via email: sharleen.k.kuba@hawaii.gov)*
X Land Division – Oahu District *(via email: barry.w.cheung@hawaii.gov)*
X State Historic Preservation Division *(via HiCRIS)*

TO:

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

SUBJECT: **Draft Environmental Assessment (DEA) for Kamehameha Highway Pedestrian Safety Project in Vicinity of Laniakea Beach**

LOCATION: Haleiwa, Island of Oahu, Hawaii

APPLICANT: **Department of Transportation-Highways Division**

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published on August 23, 2021 by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2021-08-23-TEN.pdf

Please submit any comments by **12:00 PM, noon, on September 22, 2021** to Land Division via email to barbara.j.lee@hawaii.gov. If no response is received by this time and date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at the above email address. Thank you.

BRIEF COMMENTS:

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

Signed:
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Sep 21, 2021

Attachments
Cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Draft Environmental Assessment (DEA) for Kamehameha Highway Pedestrian Safety Project in Vicinity of Laniakea Beach
Location: Haleiwa, Island of Oahu, Hawaii
Applicant: Department of Transportation-Highways Division

<u>COMMENTS</u>

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR, 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 to research 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) (http://gis.hawaiinfip.org/FHAT) 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:

- <u>Oahu</u>: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- <u>Hawaii Island</u>: County of Hawaii, Department of Public Works (808) 961-8327.
- <u>Maui/Molokai/Lanai</u> County of Maui, Department of Planning (808) 270-7139.
- <u>Kauai</u>: County of Kauai, Department of Public Works (808) 241-4849.

Signed: ______________________
CARTY S. CHANG, CHIEF ENGINEER

Date: Sep 21, 2021

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 23, 2021

LD 1027e

Mr. Bryan Tyau, HDOT Project Manager
869 Punchbowl Street
Honolulu, HI 96813-5097

Via email: Bryan.Tyau@hawaii.gov

Dear Sirs:

SUBJECT: **Draft Environmental Assessment for Kamehameha Highway Pedestrian Safety Project in Vicinity of Laniakea Beach**
Haleiwa, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the above subject. In addition to previous comments sent to you from the Department of Land and Natural Resources (DLNR) dated September 22, 2021, enclosed are comments from DLNR's (a) Land Division, Oahu District and (b) Office of Conservation and Coastal Lands.

Should you have any questions, please feel free to contact Barbara Lee at 587-0453 or barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 17, 2021

LD1027e

MEMORANDUM

TO: **DLNR Agencies:**

X Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
__ Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: rubyrosa.t.terrago@hawaii.gov)*
__ Div. of State Parks
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
X Office of Conservation & Coastal Lands *(via email: sharleen.k.kuba@hawaii.gov)*
X Land Division – Oahu District *(via email: barry.w.cheung@hawaii.gov)*
X State Historic Preservation Division *(via regular mail and messenger)*

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: **Draft Environmental Assessment (DEA) for Kamehameha Highway Pedestrian Safety Project in Vicinity of Laniakea Beach**
LOCATION: Haleiwa, Island of Oahu, Hawaii
APPLICANT: **Department of Transportation-Highways Division**

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published on August 23, 2021 by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2021-08-23-TEN.pdf

Please submit any comments by **12:00 PM, noon, on September 22, 2021** to Land Division via email to barbara.j.lee@hawaii.gov. If no response is received by this time and date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at the above email address. Thank you.

BRIEF COMMENTS:

The project proposes the realignment of the existing Kamehameha Highway mauka in favor of a pedestrian beach access and bike lane. We believethe Dept. of Transportation Highways (DOT) should continue to maintain the improvements makai of the realigned highway upon its completion, regardless of whether the lands stay with DOT or are transferred to DLNR to be unemcumbered lands within the shoreline. If necessary, authorization from the Land Board enabling DOT to conduct maintenance work can be processed, too.

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(X) Comments are included/attached.

Signed: [signature]
Print Name: Calen Miyahara
Division: Land
Date: 9/22/2021

Attachments
Cc: Central Files

T Re: DA 22-39
LD1071

DAVID Y. IGE
GOVERNOR OF HAWAII

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

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS

2021 SEP 15 A 2:31

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 14, 2021

LD1027e

MEMORANDUM

RECEIVED LAND DIVISION 2021 SEP 22 A 9:46 DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

TO: **DLNR Agencies:**
X Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: rubyrosa.t.terrago@hawaii.gov)*
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
X Office of Conservation & Coastal Lands *(via email: sharleen.k.kuba@hawaii.gov)*
X Land Division – Oahu District *(via email: barry.w.cheung@hawaii.gov)*
X State Historic Preservation Division *(via HiCRIS)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Draft Environmental Assessment (DEA) for Kamehameha Highway Pedestrian Safety Project in Vicinity of Laniakea Beach**
LOCATION: Haleiwa, Island of Oahu, Hawaii
APPLICANT: **Department of Transportation-Highways Division**

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published on August 23, 2021 by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2021-08-23-TEN.pdf

Please submit any comments by **12:00 PM, noon, on September 22, 2021** to Land Division via email to barbara.j.lee@hawaii.gov. If no response is received by this time and date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at the above email address. Thank you.

BRIEF COMMENTS:

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

Signed:
Print Name: Trevor Fitzpatrick
Division: OCCL
Date: 9/21/21

Attachments
Cc: Central Files

DAVID Y. IGE
GOVERNOR OF
HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: TF

COR: OA 22-39

SEP 2 1 2021

Brian Tyau
Hawaii Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, HI 96813

SUBJECT: Draft Environmental Assessment Announcement for the Kamehameha Highway Pedestrian Safety Project.
Located in the Vicinity of Laniakea and Kamehameha Highway (Route 83) Right-of-Way (ROW)
Kawailoa-Waimea, Waialua, Oahu
Tax Map Keys (TMKs): (1) 6-1-005:023 and 024; (1) 6-1-009:004, 021, and 022; & (1) 6-1-010:019 and 020.

Dear Mr. Tyau:

The Office of Conservation and Coastal Lands (OCCL) has reviewed your email and attachments regarding the subject matter. According to your email, the Hawaii Department of Transportation (HDOT) is seeking comments on the Draft Environmental Assessment (Draft EA) for the Kamehameha Highway Pedestrian Safety Project which was published in the August 23, 2021 edition of the The Environmental Notice. The Draft EA states that HDOT is proposing roadway improvements to address pedestrian safety, shoreline erosion, congestion, and roadway reliability along Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the North Shore of Oahu. The Draft EA notes that the primary purpose of the proposed project is pedestrian safety.

Four conditions or alternatives are identified and analyzed in the Draft EA: the No Build, the No Build Settlement, the Transportation System Management (TSM) Alternative, and the Pedestrian Shift Alternative. The Draft EA notes that the Pedestrian Shift Alternative is preferred and involves realigning Kamehameha Highway mauka (landward) up to 80 feet from its current location from the Haleiwa side of Lauhulu Stream Bridge to the Haleiwa side of Kawailoa Stream Bridge for approximately 1,100 feet. Components and details of the Pedestrian Shift Alternative also include:

- A highway right-of-way that is generally 120-feet wide with two (2) 12-foot wide through lanes (one (1) in each direction) and a 10-foot wide median refuge lane for part of the realigned distance;
- A normal asphalt road structure with provisions on the makai edge of the highway, a buried concrete cut-off wall to reduce the potential of soil erosion from under the roadway where needed;
- Vehicular guardrails to prevent parking on the mauka side of the shifted highway, placement of guardrails on the makai side of the shifted highway will be evaluated during final design to allow for streamlining of vehicles;
- Existing cross streets and driveways would be modified to allow access to the realigned Kamehameha Highway with a vehicle control gate at Pohaku Loa Way;
- Streetlights would be installed on the mauka side of the highway;
- Drainage improvements;
- A new bridge at Lauhulu Stream on the mauka side of the existing Lauhulu Stream Bridge; and
- Re-purposing the highway by converting the mauka lane of the existing Kamehameha Highway to a 16-foot wide shared use path for bicycles and pedestrians. The makai lane is proposed to be partially removed and revegetated.

The OCCL regulates land uses in 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. The OCCL supports HDOT's efforts to improve pedestrian safety while also attempting to address the anticipated impacts of climate change and sea level rise to roadway reliability. With this in mind, we offer the following comments on the subject Draft EA and the proposed Kamehameha Highway Pedestrian Safety Project.

The OCCL notes that it does not appear that our office received HDOT's January 26, 2021 Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments letter. Based on Appendix A of the Draft EA, it does not appear that the other Divisions within the Department received the letter or were able to provide preassessment comments as well.

According to OCCL files, past correspondences have stated OCCL's support for the proposed realignment of Kamehameha Highway near Laniakea Beach and Chun's Reef to reduce vulnerability to coastal erosion and wave inundation. Past correspondences also indicate OCCL's support for the "Most Realignment" Alternative contained in Section **2.5 Other Alternatives Considered but Eliminated** of the Draft EA but was removed from consideration due to impacts on cultural and historical resources, cost, schedule, and effects on Kamehameha Schools' property according to the Draft EA.

Based on the July 30, 2020 certified shoreline, it appears that the portion of the existing Kamehameha Highway that is makai of the shoreline lies within the Conservation District

Resource Subzone and may be considered a nonconforming use. The Draft EA and the preferred alternative (the Pedestrian Shift Alternative) identified in the document appear to indicate that the character of use of this portion of Kamehameha Highway will change with the realignment of the highway.

The OCCL requests that the final EA further clarify if the HDOT will continue management of the existing right of way makai of the shoreline or if the lands will be unencumbered as defined in Hawaii Administrative Rules (HAR), §13-221-2. As it appears that new land uses are being proposed makai (seaward) of the certified shoreline, it appears that further consultation with the OCCL and authorizations from the Department may be needed.

The final EA should also address how the proposed project(s) will comply with Hawaii Revised Statutes (HRS), §115 and maintaining a free and clear beach transit corridor from physical impediments such as human-induced, enhanced, or unmaintained vegetation. No improvements should be proposed makai of the shoreline other than the removal of man-made structures. The project areas identified makai of the shoreline should be allowed to naturalize to facilitate the migration of the shoreline and beach transit corridor. The OCCL thanks you for the opportunity to provide comments on the proposed project.

Should you have any questions, contact Trevor Fitzpatrick of the Office of Conservation and Coastal Lands at (808) 798-6660 or trevor.j.fitzpatrick@hawaii.gov .

Sincerely,

(For)
Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

CC: Oahu District Land Division Office
City and County of Honolulu, Department of Planning and Permitting

STATE OF HAWAII
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

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

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://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 Program

DTS 202109161305LI

September 22, 2021

To: Mr. Jade T. Butay
State of Hawaii Department of Transportation
Attn: Mr. Brian Tyau

From: Mary Alice Evans, Director
Office of Planning and Sustainable Development

Subject: Draft Environmental Assessment for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach, Haleiwa, Oahu; Tax Map Key: Kamehameha Highway Right-of-Way; (1) 6-1-005: 023 and 024; (1) 6-1-009: 004, 021 and 022; and (1) 6-1-010: 019 and 020

Thank you for the opportunity to provide comments on the subject Draft Environmental Assessment (Draft EA), transmitted via memorandum dated August 13, 2021.

According to the Draft EA, the State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing roadway improvements to address pedestrian safety, shoreline erosion, traffic congestion, and roadway reliability along Kamehameha Highway in the vicinity of Laniakea Beach on the North Shore of Oahu. Pedestrian safety is the primary purpose of the proposed project given that the conflicts between pedestrians and roadway traffic occur when vehicles park on the mauka side of Kamehameha Highway and then proceed to cross through traffic to access the beach and ocean.

The proposed pedestrian safety project consists of realigning Kamehameha Highway mauka up to 80 feet from its current location from the Haleiwa side of Lauhulu Stream bridge to the Haleiwa side of Kawailoa Stream bridge. The makai side of the realigned Highway is anticipated accommodate parking with an estimated capacity of 90 cars in the 60-foot-wide by 400-foot-long space. As a result, pedestrians from the new parking area would no longer need to cross the highway to access Laniakea Beach.

The proposed project will require approximately three acres of undeveloped property from the City and County of Honolulu Department of Parks and Recreation and Kamehameha Schools ranch property. No changes to land use under county zoning are anticipated from the proposed project.

The project construction is anticipated to last for up to 24 months and be completed by 2025. Construction costs are estimated at $12,000,000 without including the costs to obtain rights-of-way.

HDOT submitted a shoreline certification application on January 14, 2020, and the State of Hawaii Department of Land and Natural Resources certified the shoreline on July 30, 2020. Except for the existing roadway right-of-way, the proposed project is confirmed to be mauka of the shoreline and located within the county designated Special Management Area (SMA) under Hawaii Revised Statutes (HRS) Chapter 205A. A SMA Use Permit and Shoreline Setback Variance will be required from the City and County of Honolulu for the project.

The proposed project would involve State funds, use of State and County lands, use of land classified as a conservation district, as well as use of shoreline areas, and therefore require an environmental review in accordance with HRS Chapter 343.

After a careful review on the Draft EA, the Office of Planning and Sustainable Development has no comments to offer, and concurs the proposed project to improve pedestrian safety, reduce traffic congestion, and mitigate the impacts of shoreline erosion and high waves on the Highway in the subject area.

If you have any questions regarding this comment letter, please contact Shichao Li of our office at (808) 587-2841.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

BOARD OF WATER SUPPLY

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

September 3, 2021

Mr. Brian Tyau, Project Manager
State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Tyau:

Subject: Request for Comments on the Draft Environmental Assessment for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea

The Board of Water Supply has several water transmission mains along Kamehameha Highway within the vicinity of Laniakea Beach. We also have water system replacement projects along Kamehameha Highway – Haleiwa Water Systems Improvements, Part I & II in the vicinity of the project site. These projects are currently in the design phase and are tentatively scheduled to be completed in Fiscal Year 2023. Please coordinate with the Design Branch of our Capital Projects Division at (808) 748-5710.

Due to the nature of the proposed pedestrian shift alternative, there are many unforeseen circumstances and uncertainties regarding roadway ownership, public rights-of-way, and water system reliability for existing customers with water service meters along Kamehameha Highway. Existing water mains, water meters, and fire hydrants along the current Kamehameha Highway alignment should be located within paved public rights-of-way and be made accessible for repairs and maintenance. All proposed structures should be adequately set back from the water main easements for the safety of the public and to prevent damage to any structures in the event of main breaks, repair, and maintenance.

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

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

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

Very truly yours,

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

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

RICK BLANGIARDI
MAYOR

ALEX KOZLOV, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

September 9, 2021

Mr. Brian Tyau
HDOT Project Manager
Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Tyau:

Subject: Draft Environmental Assessment for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea

Thank you for the opportunity to review and comment. Our Facilities Division has comments; please see the attached.

Should you have any further questions, please contact Clifford Lau, Facilities Division Chief at 768-8483.

Sincerely,

fm Alex Kozlov, P.E.
Director

Attachments

AK:krn (860658)

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.2 Land Use	No impact.	No impact City property is less than 3 acres. The project would require the entire parcel.	No impact.	Requires approximately three (3) acres from undeveloped City DPR property and Kamehameha Schools ranch property. Kawailoa Ranch's pasture land and riding trails would be affected.	Planning and design has been and will continue to be coordinated with property owners. Real property would be procured in accordance with federal, State, and local regulations.
3.3 Historic and Archaeological Resources	No impact.	No impact	No impact	Site T-1 would be avoided. Lauhulu Stream Bridge would not be directly affected, but the change in use and alteration of the surrounding environment would be considered an effect in accordance with HAR 13-275.	Effect with mitigation based on impacts to Lauhulu Stream Bridge. Proposed mitigation is preservation in the form of avoidance and protection. Archaeological Monitoring would be conducted as agreed upon between HDOT and the State Historic Preservation Division (SHPD).
3.4 Cultural Resources	No impact.	No impact	No impact	Less than significant. No cultural resources identified, except for Site T-1, which will be avoided. Although no kupuna iwi have been encountered, cultural practitioners expressed concerns for impacts to Kamehameha Schools property, and kupuna iwi.	Archaeological monitoring would be conducted. See Section 3.3. HDOT would continue to coordinate with Kamehameha Schools and affected lessees as design progresses.

Table ES – 1: Summary of Potential Impacts by Alternative

Section	No Build	No Build Settlement	TSM Alternative	Pedestrian Shift Alternative Impacts	Mitigation / Minimization / Avoidance Measures
3.7 Parks and Recreational Resources	No impact.	No impact.	TSM Alternative would not affect the City DPR's ability to implement the park in the future. However, based on HDOT's meeting with the City DPR, as long as Laniakea Beach is owned by Kamehameha Schools, ~~there is no City beach~~ recreation area to support.	Recreational access would continue once the Highway is realigned. However, during construction, parking may be inaccessible, as determined by Contractor work areas. Construction is anticipated to last for up to 24 months.	None proposed.
3.8 Visual and Aesthetic Resources	No impact.	No impact.	No impact.	No impact.	None proposed.
3.9 Roadways and Traffic	Traffic would continue to be congested.	Traffic Congestion would be improved over the No Build, assuming that pedestrians use the crosswalks.	Traffic Congestion would be improved similar to the No Build Settlement.	The Pedestrian Shift Alternative would improve traffic congestion.	None proposed. The proposed project in itself is a mitigation measure.
3.10 Pedestrian Safety	No change to safety conditions would occur.	Pedestrians could cross at crosswalks, potentially reducing pedestrian accidents.	Parking would be eliminated on the mauka side of the Highway. This Alternative may move the pedestrians to other parts of the Highway if they can find additional parking.	Pedestrians would no longer need to cross the Highway to access Laniakea Beach eliminating concerns for pedestrian safety.	None proposed.

will the state be responsible for the area since it will all be state property?

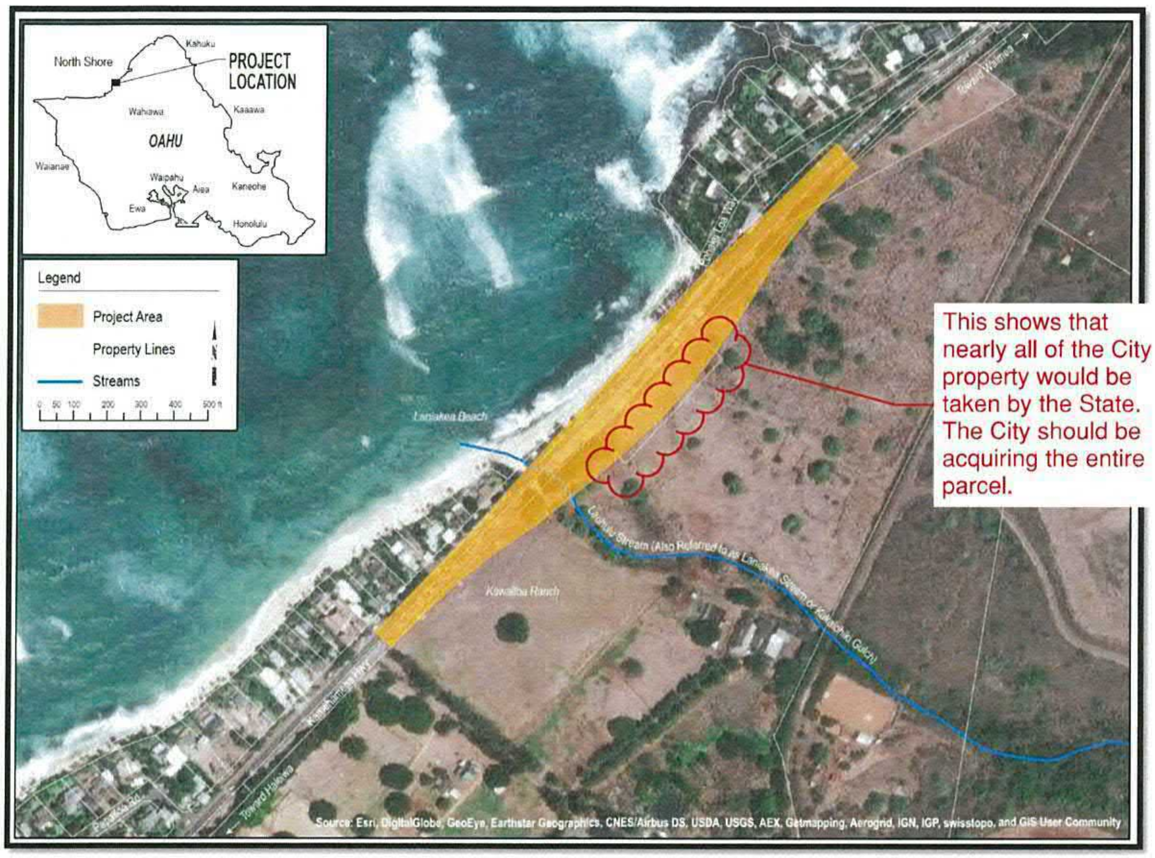


Figure 1-1. Project Location

With this Alternative, it is assumed that shoreline erosion mitigation would be undertaken on an as needed basis, as it is today. This typically involves (a) closing the highway during periods of high surf when the highway is overtopped by waves, (b) the removal of sand and debris from the highway surface following high wave events, and (c) periodic maintenance of the rocks protecting the highway embankment along the shoreline. These activities would be performed within the existing highway ROW to the degree practicable.

In the event the Highway was to suffer greater damage, more invasive emergency repair projects may be necessary. Such emergency projects have occurred elsewhere in Hawaii, including, for example, Kamehameha Highway repair at Kaaawa on Oahu and Honoapiilani Highway shoreline repairs on Maui, which both resulted in the installation of shoreline revetments. Some may find these emergency projects preferable to improvement projects due to their speed and perceived short-term improvements. However, such emergency projects have noteworthy shortcomings, including: (a) only the same facilities can be rebuilt, no enhancements can be made; (b) the repairs do not address the underlying cause of the emergency and the facility remains under threat of a repeat event; (c) adverse short-term impacts may occur, both to the travelling public and the natural environment; and (d) unintended adverse long-term impacts may also occur to the natural environment, such as beach loss when shoreline revetments are installed.

Other development in the project area would occur under the No Build Alternative. The scope of all public and private development in the project area between now and 2030 is unknown; however, some projects have been planned or proposed, including the following:

- Papailoa residential infill project, by Kamehameha Schools
- Kapaeloa residential infill project, by Kamehameha Schools
- Kuikuiloloa Ag Area project, by Kamehameha Schools

At this time, the City DPR has no plans to implement the development of Laniakea and Kawailoa Beach Parks as described in Section 3.2.

2.2 No Build Settlement Alternative

The No Build Settlement Alternative involves allowing cars to park on the mauka side of the Highway on an unpaved parking area for better public access to Laniakea Beach and installing guardrails and crosswalks so that visitors might cross the Highway in a safer, more orderly fashion. Cars will enter the parking area by making a right-turn from Kamehameha Highway on the Haleiwa side of the parking area. Cars will exit the parking area by making a right-turn onto Kamehameha Highway at the Waimea end. Cars travelling on Kamehameha Highway in the Haleiwa-bound direction will be prohibited from making left-turns into the parking area. Additionally, cars exiting the park~~ing area will be prohibited from making a left~~ turn towards Haleiwa.

the City has already done this.

As the unpaved parking area is now, it is estimated that 50-60 parking spaces would be available. In addition, the City DPR will move a cattle fence on its property mauka of the Highway so that cars have room to maneuver and park. The agreement further prohibits large tour buses and vans that often shuttle tourists to Laniakea from stopping there. The settlement agreement calls for a one-year trial period, but there is no deadline for the changes to take place.

- A new bridge at Lauhulu Stream on the mauka side of the existing Lauhulu Stream Bridge; and
- Re-purposing the highway by converting the mauka lane of the existing Kamehameha Highway to a 16-foot wide shared use path for bicycles and pedestrians. The makai lane would be partially removed and revegetated.

This Alternative is based on the previously developed "Minor" Alternative without a large coastal revetment and the "Quinlan" Alternative without parking and tight curves (Section 2.5.3). Because the road is shifted, there would be no open area for parking on the mauka side and the temptation to park and cross the road to access the beach would be removed. However, the makai side of the realigned Highway could accommodate parking with an estimated capacity of 90 cars in the 60-foot-wide by 400-foot-long space. This would exceed the estimated 50-60 cars that could park on the mauka side of the highway under the No Build Settlement.

During construction, the parking area may be restricted or limited by placing guardrail or barriers, as determined by the Contractor's work areas. The guardrail will provide safety by separating the public vehicles and pedestrians from the construction area. Estimated timeframe for construction is 24 months.

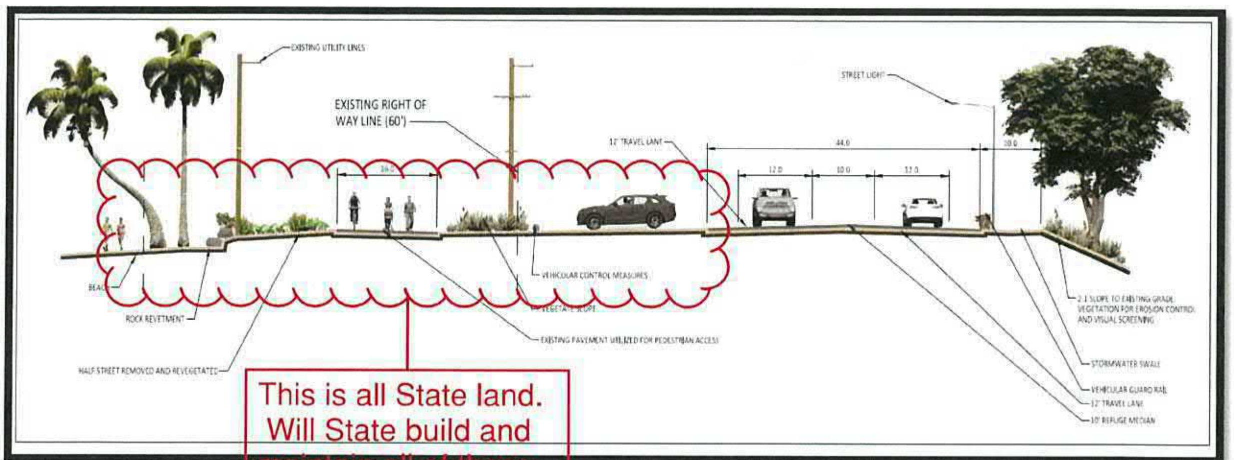


Figure 2-6. Pedestrian Shift Alternative Alignment Typical Section

Table 3-2. Summary of Potential ROW Acquisition

TMK	Area (acres)	Owner	Use	Pedestrian Shift Alternative Acquisition (estimated acres)
6-1-005:023	144	KSBE	Ranch/pasture	0.4
6-1-005:023	144	KSBE	Ranch/pasture	0.2
6-1-005:024	2.084	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.8
6-1-009:004	2.028	Ung, et.al.	Undeveloped, portion former OR&L ROW	0.15
6-1-009:021	0.707	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.07
6-1-009:022	0.389	KSBE	Undeveloped, former OR&L ROW	0.4
6-1-010:019	0.346	City's DPR	Undeveloped, planned Laniakea Beach Support Park	0.3
6-1-010:020	1.44	KSBE	Ranch/pasture; former OR&L ROW	0.5
Total				**3 acres**

The Pedestrian Shift Alternative has been designed to avoid and minimize impacts to the City DPR's undeveloped park parcels to the degree possible. However, this Alternative impacts the [illegible] hat may require redesign of the facilities described in [illegible]

based on these numbers the state would have acquire majority of the City property and only leave an unusable sliver of land. Suggest that the State would need to take the entire parcel. City parcel only 2.47 acres.

[illegible] l regulations require fair compensation for the land [illegible] y to be acquired will be based on property owner [illegible]

[illegible] rtial displacement of Kawailoa Ranch's pastureland located Haleiwa of Lauhulu Stream Bridge. Additionally, about 500 feet of a riding trail near Pohaku Loa Way would be affected. The City DPR's acquisition of the Kamehameha Schools property has already disrupted portions of the trail. These land use impacts are not anticipated to be so severe that they would cause the ranch to become inoperable. No land use would be totally displaced.

3.2.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

As noted in Section 3.2.2., none of the land use activities occurring on the affected parcels would be fully displaced. However, coordination with the landowners and tenants of affected parcels will be conducted during the project's design to avoid, minimize, and mitigate any unforeseen impacts to land use operations or activities.

Any real property acquisitions or entitlements will be procured in accordance with federal, State and local regulations.

No Build Settlement Alternative

The No Build Settlement Alternative would provide sanctioned parking for Laniakea Beach. Given the existing usage of the same parking area on the mauka side of the Highway, visitation to these recreational sites is anticipated to remain largely the same. There may be a slight increase in visitation, by both tourists and locals [illegible] ced with guardrails and crosswalks.

There should not be any obligation for the City to develop the site since all of the land will be under State control. Also with the coastal erosion and sea level rise it is not fiscally responsible for the City invest in developing a park here.

TSM Alternative

The TSM Alternative would not impact [illegible] ure.

Pedestrian Shift Alternative

For the Pedestrian Shift Alternative, recreational access would continue at Laniakea Beach with the provision of access to parking on the makai side of the Highway. The walk to the beach from the parking area would be safer and easier, especially for families and those with disabilities.

The Pedestrian Shift Alternative was designed recognizing the City DPR's potential future park use. This Alternative would not preclude the City DPR from developing a formal parking area or beach support amenities.

As discussed in Section 3.16.4, parking and access to Laniakea Beach as a recreational area would be more difficult during construction as a guardrail barrier would be installed as determined by the Contractor to establish the work areas. This impact would be temporary, as construction is anticipated to last for up to 24 months.

3.7.3 Avoidance, Minimization, and Mitigation Measures

TSM Alternative

No Avoidance, Minimization, and Mitigation Measures are needed for the alternative.

Pedestrian Shift Alternative

Shifting the Kamehameha Highway mauka would support ready access to Laniakea Beach and its recreational resources by removing the conflicts between the Highway and those wishing to access the beach. As noted in the previous section, parking and access to Laniakea Beach would be temporarily limited for up to 24 months while the improvements are constructed.

3.8 Visual and Aesthetic Resources

3.8.1 Regulatory Requirements

The project will not use federal funding and will not be required to complete FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015). However, these guidelines, referred to as the "FHWA guidelines," are a broadly accepted approach to analyzing visual impacts, particularly for transportation projects. The FHWA guidelines use changes in visual character and viewer group sensitivity to assess changes in visual quality. The Visual Impact

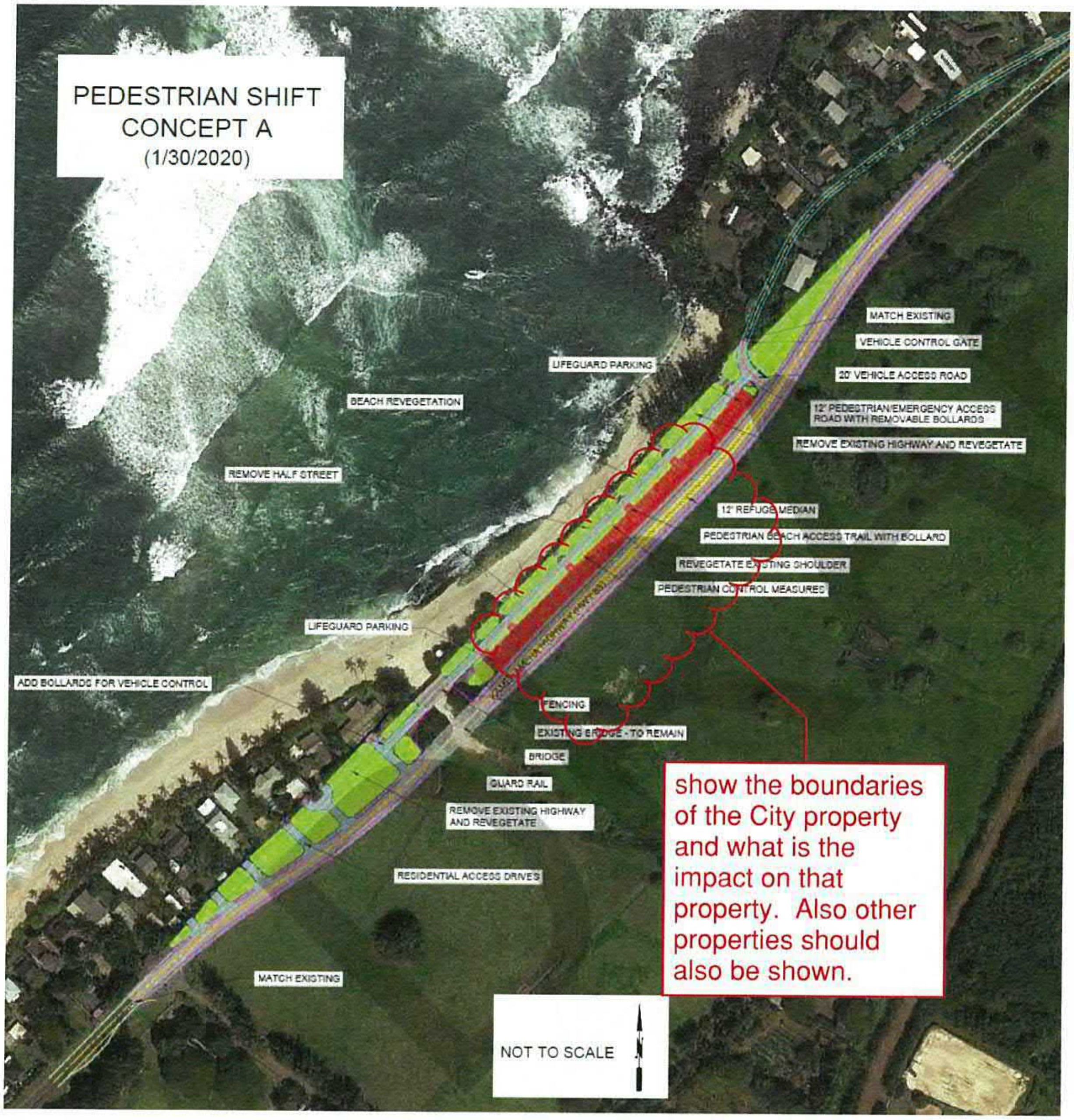


Figure 1-5. Plan view of the Pedestrian Shift alternative

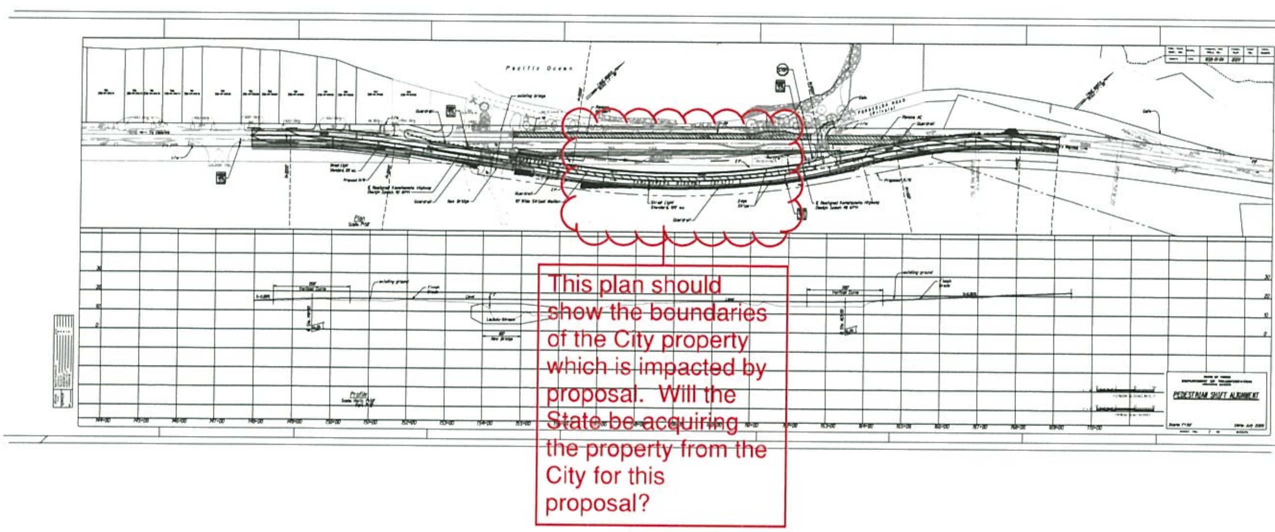
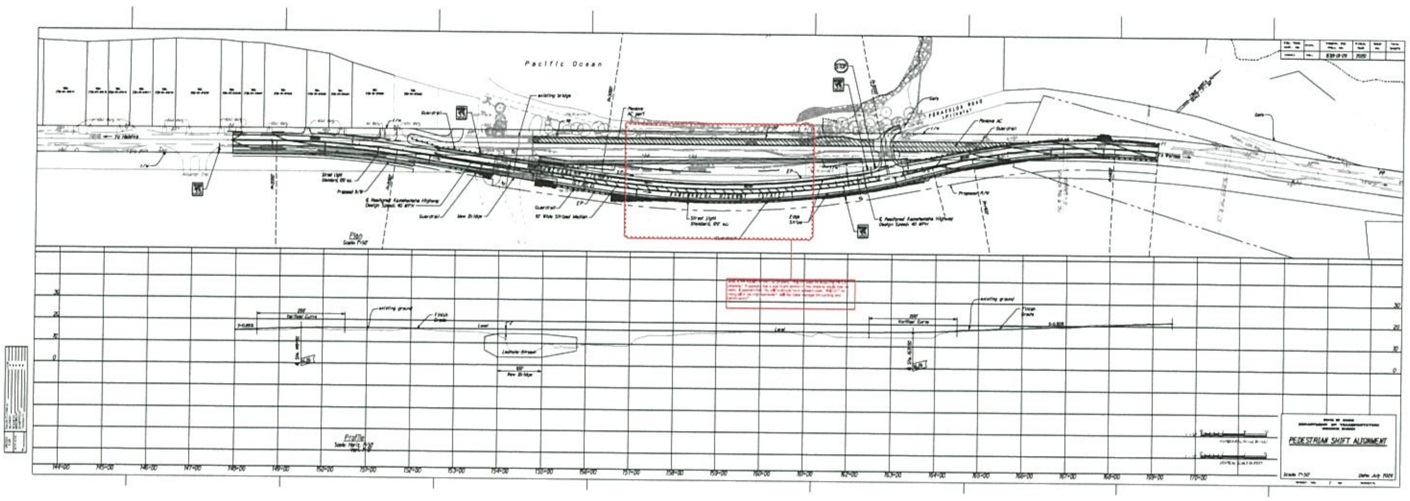


Figure 1. Plan and Profile for the Proposed Pedestrian Shift showing study area.



Pacific Ocean
Plan
Profile
New Bridge
PEDESTRIAN SHIFT ALIGNMENT

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

RICK BLANGIARDI
MAYOR

LAURA H. THIELEN
DIRECTOR

KEHAULANI PU'U
DEPUTY DIRECTOR

October 25, 2021

SENT VIA EMAIL

Mr. Brian Tyau, HDOT Project Manager
Brian.Tyau@hawaii.gov

Dear Mr. Tyau:

SUBJECT: Draft Environmental Assessment
Kamehameha Highway, Pedestrian Safety Project
Vicinity of Laniakea

As requested, the Department of Parks and Recreation has accessed the subject Draft Environmental Assessment published on the Office of Environmental Quality Control's website page on August 23, 2021.

The Department supports the selected Pedestrian Shift Alternative realigning Kamehameha Highway mauka up to 80 feet from its current location from the Haleiwa side of Lauhulu Stream bridge to the Haleiwa side of Kawailoa Stream bridge for roughly 1,100 feet.

Should you have any questions, please contact Mr. John Reid, Planner at 768-3017.

Sincerely,

Laura H. Thielen
Director

LHT:jr
(860682)

cc: Miles Hazama, D4

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

PMC

RICK BLANGIARDI
MAYOR

DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

September 22, 2021

2021/ELOG-1669(LP)

Mr. Brian Tyau
Engineering Program Manager
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Tyau:

SUBJECT: Kamehameha Highway Pedestrian Safety Project
Draft Environmental Assessment (EA)
Vicinity of Laniakea Beach

This is in response to your letter, received August 23, 2021, requesting comments on the Draft EA prepared for the subject Project in compliance with Chapter 343, Hawaii Revised Statures (HRS). The following are our comments for the items to be address in the Final EA:

1. The Final EA should answer and explain the following questions associated with the objectives and policies of Chapter 205A, HRS:

   a. Is there adequate public access to diverse coastal recreational opportunities, like beaches, recreation areas, and natural reserves provided by dedication or other means? If so, please describe how the access consistent with sound conservation principle.

   b. Is the site near any identified scenic resources? If so, how will the Project limit interruption of those views? Please use appropriate resources such as the 1987 Coastal View Study and the North Shore Sustainable Communities Plan (NSSCP) to identify the scenic resources.

   c. How will the development be designed to minimize impacts from floods, wind damage, storm surge, landslides, erosion, sea level rise, siltation, or failure in the event of earthquake?

d. How does the Project comply with the National Flood Insurance Program and the provisions of Chapter 21A, Revised Ordinances of Honolulu?

e. Will the Project exacerbate coastal flooding? If so, what mitigation measures are proposed? If not, how was that determined?

f. Please include an analysis on hurricanes, storm surges, and earthquakes in the Project area.

g. Are there cumulative adverse effects/impacts relating to individual developments within the plan, each of which taken by itself might not have a significant adverse effect? If so, how will they be mitigated?

h. Does the project eliminate future planning options?

2. The Final EA should list and address all relevant policies and guidelines of the NSSCP and the General Plan. The Final EA should include a discussion on how the proposed action comports with Sections 3.3.2.3 and 4.1.1 of the NSSCP. Please also note that the NSSCP is currently being reviewed for revisions and the General Plan is under revision at Council as Resolution No. 21-23.

3. Plans should show the shoreline and the shoreline setback. The Final EA should indicate what parts of the Project will be within the shoreline and will need a Shoreline Setback Variance (SSV). A certified shoreline survey will be required in the SSV application.

4. The Draft EA indicates that the U.S. Army Corps of Engineers (USACE) conducted a site visit and found no wetlands that will be impacted by the Project. The new bridge appears to be directly over Lauhulu Stream and the Draft EA states that no abutments or structures will be in the stream bed or in any wetlands. A summary of the consultation with the USACE should be included in the Final EA. The Special Management Area (SMA) Use Permit application should include confirmation from the USACE that a Department of the Army Permit is not required.

5. The Final EA should include a narrative describing the Project's post-construction stormwater quality strategic plan to comply with the "Rules Relating to Water Quality" ("Rules"). The narrative should include a written description of the proposed development, expected activities and pollutants that will be generated by activities at the site, and Low Impact Development site design strategies that will be used to comply with the Rules and include a development schedule. The

Project's compliance with the Rules Relating to Water Quality will be verified at the time that the grading/construction plans are submitted to DPP for review.

6. The Project site is within the SMA and Section 2.7 of the Draft EA suggests that an SMA Use Permit and SSV will be required for the Project. Please note that the SMA Use Permit requires a presentation to the Neighborhood Board prior to submittal, pursuant to Ordinance No. 21-27.

7. The SSV will be reviewed under the public interest standard. The SSV application will have to discuss how the Project will clearly be in the public interest, is the practicable alternative which best conforms to the public of Chapter 23, Revised Ordinances of Honolulu, and the shoreline setback rules.

8. If the Pedestrian Shift Alternative is implemented, the highway realignment will be subject to a subdivision application. Construction within the floodplain (coastal and riverine zones) is subject to compliance with the provisions of the City's Flood Hazard Ordinance and the National Flood Insurance Program.

9. Based on the information in the Draft EA, a grading permit is required. Based on the preliminary drainage report prepared by WSP, the drainage design criteria that may be used for grading permit purposes is based on State of Hawaii Department of Transportation's design criteria, which is more conservative and acceptable. We recommend that the State consider using Plate 6 to determine the 100-year peak design flow at the proposed bridge.

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

Very truly yours,

For: Dean Uchida
Director

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

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

RICK BLANGIARDI
MAYOR

LIONEL CAMARA JR.
ACTING FIRE CHIEF

SHELDON K. HAO
ACTING DEPUTY FIRE CHIEF

September 10, 2021

Mr. Bryan Tyau
Project Manager
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Tyau:

Subject: Draft Environmental Assessment Request for Comments
Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea
Haleiwa, Hawaii 96712

In response to your postcard received August 24, 2021, regarding the abovementioned subject, the Honolulu Fire Department determines that there will be no significant impact to fire department services.

Should you have questions, please contact Battalion Chief Reid Yoshida of our Fire Prevention Bureau at 723-7151 or ryoshida@honolulu.gov.

Sincerely,

JASON SAMALA
Assistant Chief

JS/TC:gl

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 202
HONOLULU, HAWAII 96813-3065
TELEPHONE: (808) 768-5010 • FAX: (808) 768-5011

HEIDI TSUNEYOSHI
CITY COUNCILMEMBER
HONOLULU CITY COUNCIL
DISTRICT II
TELEPHONE: **(808)768-5002**
FAX: **(808) 768-1222**
EMAIL: htsuneyoshi@honolulu.gov

Memorandum

Date: September 22, 2021

To: Mr. Bryan Tyau
State of Hawaii Dept. of Transportation
Highways Division

From: Councilmember Heidi Tsuneyoshi
City Council District II

RE: HWY-PA 2.5136 Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach Pre-Draft Environmental Assessment (EA) Scoping and Request for Comments

Thank you for the opportunity to provide comment on this very important and long-awaited project for the residents of the North Shore. On behalf of the residents I am most grateful that a plan of action is being moved forward to address the public health and safety concerns associated with the traffic congestion and compromised roadway conditions in the vicinity of Laniakea Beach.

As indicated by the title, the project focuses on pedestrian safety but also addresses critical issues such as improving the reliability of the highway, relieving congestion and improving options for pedestrian and bicycle facilities. I am grateful for the comprehensive assessment and believe that all these issues need to be addressed. As noted in the report, this area of the highway has been and continues to be undermined by shoreline erosion and wave activity that threatens the stability of the highway which is very concerning.
I am greatly concerned for residents of the North Shore should this section of the roadway be compromised as it is the only access road for the area. Residents would be left stranded which could have grave consequences in the event of a natural disaster. Additionally, the congestion on this roadway greatly compromises the ability of our First Responders to respond to emergency situations during which timing could be a matter of life or death. Lastly, the quality of life of residents living in this area have been adversely impacted by the shoreline erosion and influx of visitors and locals alike to this popular area.

In light of the time and effort that has brought us to this important juncture, I humbly ask that the Department of Transportation consider the No Build Settlement Alternative as the immediate, short-term solution while working toward the Pedestrian Shift Alternative as the long-term solution which is the preferred alternative by DOT and the majority of community members. I understand that the DOT has gone through many iterations and processes throughout the many years of this issue and I am very grateful for the focused attention at this time and feel it would be appropriate and beneficial to capitalize on the momentum by implementing both the short-term and long-term options.

I strongly believe that time is of the essence and am advocating for the continued focus forward to expedite the process and hopefully finish ahead of the 2025 schedule for construction completion for the Pedestrian Shift Alternative. Please feel free to contact me with any addition questions. MAHALO!

Very Sincerely,

Heidi Tsuneyoshi

Heidi Tsuneyoshi
City Council
District II

The Senate

STATE CAPITOL
HONOLULU, HAWAII 96813

September 22, 2021 **Submitted via Email**

Brian Tyau, Highways Division Brian.Tyau@hawaii.gov
Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Rachel Adams Rachel.adams@wsp.com
WSP USA Inc.
1001 Bishop St, #2400
Honolulu, Hawaii 96815

RE: Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea (DEA-AFNSI)

I support the preferred Pedestrian Shift Alternative to realign the highway at Laniakea, provided that the design includes ample legal parking makai of the roadway, and safe vehicular ingress and egress.

I oppose an indefinite prohibition of all parking in the project area during construction. The highway will not be closed during construction, although temporary detours and other safety measures will likely be deployed. Similarly, temporary parking alternatives should be included in the construction plan.

I strongly oppose the TSM Alternative or any option that restricts parking; I would support the Settlement Option as a short or interim project; and the No Build alternative is unacceptable.

Here are additional comments and suggested edits.

Table ES 3.14 Air Quality
Whether statistically significant or not, it seems that air quality would surely be improved when hundreds of vehicles no longer idle or move slowly through this traffic bottle neck. I have the same comment relating to "**3.14.2 Potential Impacts**."

Table ES 3.15 Social and Economic Conditions
Resident quality of life would be tremendously enhanced by resolving this traffic bottleneck and saving 30 minutes each way. Employers would benefit greatly by not having to pay their employees to sit in traffic, wasting time, productivity and fuel.

1.0 Introduction

"When this project was initiated in 2011, it was called the "Kamehameha Highway Realignment, Vicinity of Laniakea Beach". At the time, the primary purpose was to address shoreline erosion, and roadway reliability."

At the first task force meeting on 1/25/2012, the first item listed under Purpose and Need was "Improve safety and accessibility (for pedestrians, accessing beach, bicyclists, and motorists." Recognizing that the task force members were most concerned about congestion relief, the presenter made very clear that safety must be part of the need. Other listed components were reliability, erosion, parking, congestion, and consideration of the parks. (Ex. 1)

1.4 Project History

This section would be improved with additional discussion of efforts to realign this highway. Community advocacy for this project formally began in 2005 when both the North Shore Chamber of Commerce and North Shore Neighborhood Board joined the Oahu Metropolitan Planning Organization Citizen's Advisory Committee. (OMPO CAC)

In 2006, the CAC recommended that projects S50 & S42 be consolidated in the proposed FY 2008-2011 Transportation Improvement Program to "Combine the two projects into a project that would realign Kamehameha Highway mauka at Laniakea Beach." HDOT's response was "Yes – S51 and S76. They can be combined into one contract." (Ex. 2)

In 2007, HDOT declined a work element proposal to realign or bypass a section of Kamehameha Hwy at Laniakea for the FY 2008 Overall Work Program. (Ex. 3) The North Shore Neighborhood Board wrote to express the community's disappointment. (Ex. 4)

In 2007, the Hawaii State Legislature appropriated $1.2 million dollars for "Plans for the realignment of Kamehameha Highway along the areas of Laniakea Beach and Chun's Reef." HDOT never utilized the appropriation and the funds lapsed in 2009. In 2008, the North Shore Neighborhood Board again expressed its disappointment about lack of action. (Ex. 5)

Shortly after the legislature's appropriation lapsed, HDOT reprogrammed $1.7 million of its funds for a traffic alternatives study and environmental assessment. A contract was approved in 2010 for $1.4 million. Notice to proceed was issued January 10, 2011, with a condition to complete the work within 480 calendar days. (Ex. 6) This is the project that included a public advisory group. No final report was published.

Page 2-11 "Kukaeohiki"
Check the spelling, this name is Kukaiohiki elsewhere.

Figure 3-10. Proposed City and County of Honolulu Parks
The Mauka portion is labeled Proposed Laniakea Park, but this is part of the Proposed Kawailoa Park. The label should be corrected. (Ex. 7)

I recognize there will remain other traffic challenges along the North Shore, but this is an important project that is long overdue. I truly hope this realignment project moves forward expeditiously; our community has been waiting a long time.

Mahalo,

Gil Riviere

Gil Riviere
Senator, District 23
Oahu's North and Windward Shores

Kamehameha Highway Realignment
Vicinity of Laniakea Beach, O'ahu

Purpose and Need

Possible components include:

- Improve safety and accessibility (for pedestrians accessing beach, bicyclists, and motorists)
- Improve roadway reliability.

Safety – Must be part of Need

Kamehameha Highway Realignment
Vicinity of Laniakea Beach, O'ahu

Purpose and Need

- Address beach/road erosion to preserve for future generations.
- Address Parking.
- Congestion-relief caused-by ocean sight-seeing.
- Consider planned parks.

Reliability – includes solution to high surf over topping roadway

Erosion – good to allow beach to form

Kamehameha Highway Realignment
Vicinity of Laniakea Beach, O'ahu

Break Out Groups

1. Select a Recorder, and a Reporter.
2. Consider the following:
   a) What do you do in the project area and is there a need that relates to that activity?
   b) Do we agree that the list of "needs" in the purpose and need statement is complete?
   c) Clarify the meaning of each statement. (Safety for Who? Parking for What?) Does everyone agree?
   d) Prioritize the needs.
3. Report Back

Exh 1

Response

OahuMPO CITIZEN ADVISORY COMMITTEE RECOMMENDATIONS					AGENCY RESPONSES	
PROJ. #	Facility/Project Title	Project Description	Project Type	District	Included in Draft FYs 2008-2011 TIP?	Implementing Agency
453	TheBus Service, Expansion, Islandwide	Expand the bus service through increase of capacity of the existing system to accommodate population growth.	Transit	Islandwide	No – Operating funds are not eligible in the TIP.	City
444A	TheBus Service, Expansion, North Shore, Waianae, & Windward Oahu	Expand the bus service through increase of Express bus service to the North Shore, Waianae, and Windward Oahu.	Transit	North Shore Koolauloa Koolaupoko	No – Operating funds are not eligible in the TIP.	City
508	Transit Centers, Various Locations	Construct transit centers at various locations islandwide to support the Rail Transit and TheBus systems.	Transit	Islandwide	Yes – C24	City
C22	Transit Related Safety and Security Projects	Capital projects at various locations to improve security/safety at bus stops, park-and-ride lots, and bus facilities.	Transit	Islandwide	Yes – C22	City
20	Transportation Demand Management (TDM) Program	Develop an aggressive TDM program that could include, but is not limited to: 1) Free real-time online carpool matching,2) Outreach promotion and marketing of alternative transportation, 3) Emergency ride home program, 4) Major special events, 5) Employer-based commuter programs, 6) Emerging and innovative strategies (e.g., car sharing).	Islandwide Projects	Islandwide	Yes – S94 Vanpool Program	City and State
PROJECT MODIFICATIONS – CAC recommended that these projects be modified and included in the TIP.						
21, 22	Van Pool Program	Modify to include access for the elderly and disabled.			Yes – S94 Vanpool does have special accommodations for the disabled that could apply to the elderly as well.	State
S50 & S42	• Kamehameha Highway, Shoreline Protection, Vicinity of Kawailoa Beach • Kamehameha Highway, Rehabilitation of Kawailoa Stream Bridge	Combine the two projects into a project that would realign Kamehameha Highway mauka at Laniakea Beach.			Yes – S51 and S76. They can be combined into one contract.	State

Exh 2

OahuMPO

March 13, 2007

MEMORANDUM

To: Gil Riviere
North Shore Chamber of Commerce

From: Marian Yasuda, Community Planner

Re: Fiscal Year 2008 Overall Work Program (OWP) Suggested Work Element

---

The work element proposal you submitted regarding planning for the realignment or bypass of Kamehameha Highway at Laniakea Beach for the FY 2008 Overall Work Program is not included in the FY 2008 OWP. The Hawaii Department of Transportation (HDOT) declined to sponsor this work element. However, you are welcome to resubmit the proposal during the FY 2009 OWP call for work elements.

The public review draft of the FY 2008 OWP can be viewed on the OahuMPO website. The review period ends on April 2, 2007.

We appreciate your time and attention given to this effort. If you have any further questions regarding the OWP, please feel free to contact me at 587-2015.

Oahu Metropolitan Planning Organization
Ocean View Center / 707 Richards Street, Suite 200 / Honolulu, Hawaii 96813-4623
Telephone (808) 587-2015 • (808) 523-4178 / Fax (808) 587-2018 / email: ompo001@hawa

Exh. 3

April 11, 2007

Mr. Barry Fukunaga, Director
Department of Transportation
869 Punchbowl St
Honolulu, HI 96813

Dear Mr. Fukunaga:

On behalf of the North Shore Neighborhood Board, I must express the community's disappointment that the Department of Transportation declined to sponsor a work element in the FY 2008 Overall Work Program relating to an environmental study for Kamehameha Highway in the Laniakea area of Kawailoa.

Two meetings were held in Senator Robert Bunda's office to discuss the community desire, reasons and benefits for a realignment or bypass of this section of Kamehameha Highway. Rod Haraga and Ron Tsuzuki from DOT participated, along with Representative Michael Magaoay, DLNR Director Peter Young, Reed Matsuura from Councilman Dela Cruz's office, Gordon Lum from OMPO, Giorgio Calderon and Kalani Fronda from Kamehameha Schools and representatives of the North Shore Chamber of Commerce and the North Shore Neighborhood Board.

Senator Bunda requested $1.2 million in this year's CIP Budget to fund the study and DLNR requested funding through the Federal Highway Enhancement Funds. Mr. Young mentioned that DLNR is willing to swap land with Kamehameha Schools to help offset their loss of land. Every department and agency, with the possible exception of one, very much wants to see this project move forward.

The benefits of realigning or bypassing the highway around the beach areas in Kawailoa include:

- Improved traffic flow and safety
- Improved safety for beach users who cross the increasingly dangerous highway
- The opportunity to restore and enhance the beaches
- The City could build beach facilities on the beach instead of mauka of the highway
- The existing bridges are obsolete and must be rebuilt anyway
- The new roadway would not be exposed to damage from high surf and closure
- The affected landowner is willing to help

It is hard to imagine a more favorable set of circumstances for such a project. We humbly ask that your department reconsider its decision or let us know why it opposes the project.

Respectfully,

Mike Lyons
Chairman, North Shore Neighborhood Board (#27)

Cc: Governor Linda Lingle

Exh. 4

November 25, 2008

Mr. Brennon Morioka, Director
Department of Transportation
869 Punchbowl St
Honolulu, HI 96813

Dear Mr. Morioka:

On behalf of the North Shore Neighborhood Board and residents and visitors who drive on Kamehameha Highway on the North Shore, I would like to request an update from the Department of Transportation on the pending Traffic Alternatives Study for the Kawailoa area.

The area in question is commonly known for the surf spot, Laniakea, and is now known to tourists throughout the world as a place to observe basking green sea turtles. Frequent pedestrian street crossings all along this short stretch of highway create dangerous situations every day and terrible traffic flow most days.

The Legislature appropriated $1.2 million to study this area in 2007 based on estimates provided by the State DOT. One and a half years later, the project has not begun and the community continues to endure the unsafe and predictable traffic gridlock.

This traffic project is extremely important to our community and the funding is in place. Please let us know when we can expect the project to begin and its estimated time to completion.

Respectfully,

Mike Lyons
Chairman, North Shore Neighborhood Board (#27)

Cc: Governor Linda Lingle

Exh 5

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
INTERIM DIRECTOR

Deputy Directors
Ford N. Fuchigami
Jan S. Gouveia
Randy Grune
Jadine Urasaki

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

IN REPLY REFER TO:
HWY-PA
2.7472

RECEIVED
JAN 27 2011

January 10, 2011

Mr. Randall M. Urasaki
Vice President
PB Americas, Inc.
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

Dear Mr. Urasaki:

Subject: Kamehameha Highway Realignment, Vicinity of Laniakea Beach
Project No. 83B-01-09, Contract No. 59754

Enclosed for your files is a fully-executed copy of Contract No. 59754. The contract essentially engages the services of your firm to conduct planning and design services for the subject project.

You are hereby given Notice to Proceed for the subject project effective January 10, 2011. As indicated in our contract, all work should be completed within four hundred and eighty (480) calendar days of this date, excluding the State's review time.

It is requested that you indicate receipt of this Notice to Proceed by signing and dating in the space provided below and returning the original letter to the undersigned.

If you have any questions, please contact Darell Young, Highways Division, Planning Branch, Advance Planning Section, at 587-1835.

Very truly yours,

EDWIN H. SNIFFEN
Administrator
Highways Division

Enclosure

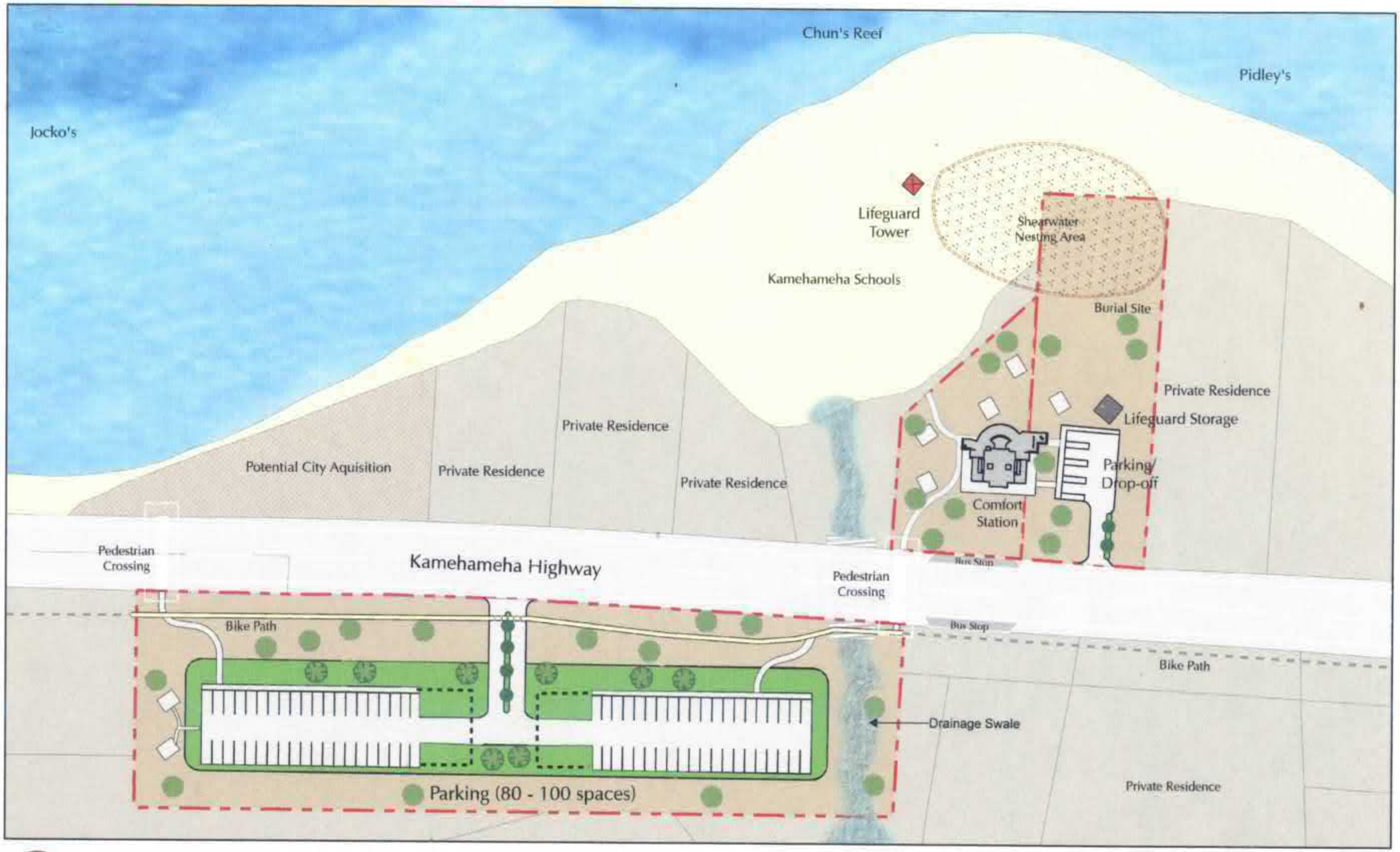
Received and Concurred:

PB Americas, Inc.

By ____________________
Its Vice President

1/27/11
Date

Exh 6



Kawailoa Beach Park

Concept Site Plan - Alternative A

August

Exh. 7

> On Sep 12, 2021, at 12:52 PM, Beau Sheil <beau@tropicblue.net> wrote:
>
> Thanks for sending this Draft EA to me (and many other local residents) for review.
>
> I appreciate the level of detail provided and I support your proposed choice of the Pedestrian Shift Alternative option.
>
> If I could make 2 minor and one larger comment:
> 1) Your Executive Summary says of the TSM Alternative Option
>> This Alternative may move the
>> pedestrians to other parts
>> of the Highway if they can
>> find additional parking.
> In fact, the previous experiment with blocking the mauka parking caused exactly this effect, with visitor cars parked a half mile or more on either side of the barriers. It just spread the pedestrian safety problem out. I'd suggest that your Executive Summary be more definite about this.
> 2) At one point, you comment on utility pole and wires having bad effects on the view of the beach. Surely, this level of construction would provide a very low cost opportunity of undergrounding these poles and wires for the extent of the project.
>
> More importantly,
> 3) This proposal brings all the traffic back onto the old Kam Hwy near Pohaka Lo Way. But this is going to recreate the problem at Chuns Reef - indeed, it's already starting to happen. I understand how difficult it is to extend an already large and difficult project, but if no consideration is given to this now, you'll be doing it all over again for Chuns Reef the day construction on this project is finished.
>
> Thanks again for soliciting our input.
>
> - Beau Sheil
>

From: nimboy44@aol.com
Sent: Tuesday, August 24, 2021 3:59 PM
To: Brian.Tyau@hawaii.gov
Cc: McClellan, Malie
Subject: Laniakea Parking Pedestrian Shift Alternative

Aloha Brian,

on page 45 of the DEA (2.5.6 Pedestrian Shift Alternative Configuration Options) it is stated that Pohaku Loa Way could not be considered as the way to connect back to the highway because it is a private street.

It is the understanding of the North Shore Neighborhood Board Laniakea Committee that Pohaku Loa Way would be the only access to the parking area and that vehicles would not be able/allowed to access the parking from the Highway.

Can you please advise what the plan is for parking access.

Thanks,

Bill Quinlan

Douglas Meller
douglasmeller@gmail.com

September 21, 2021 Comments on Draft Environmental Assessment for Proposed Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach

Submitted to:

- HDOT Project Manager, Mr. Brian Tyau via email at: *Brian.Tyau@hawaii.gov*
- EA Consultant, Ms. Rachel Adams via email at: r*achel.adams @wsp.com*

GENERAL COMMENTS

I support any project which would make it safer for the public to park near and/or walk to Laniakea Beach. I oppose any project which would close and not replace public parking at Laniakea Beach for an indefinite multi-year period.

REQUESTED MODIFICATIONS OF THE PEDESTRIAN SHIFT PREFERRED ALTERNATIVE

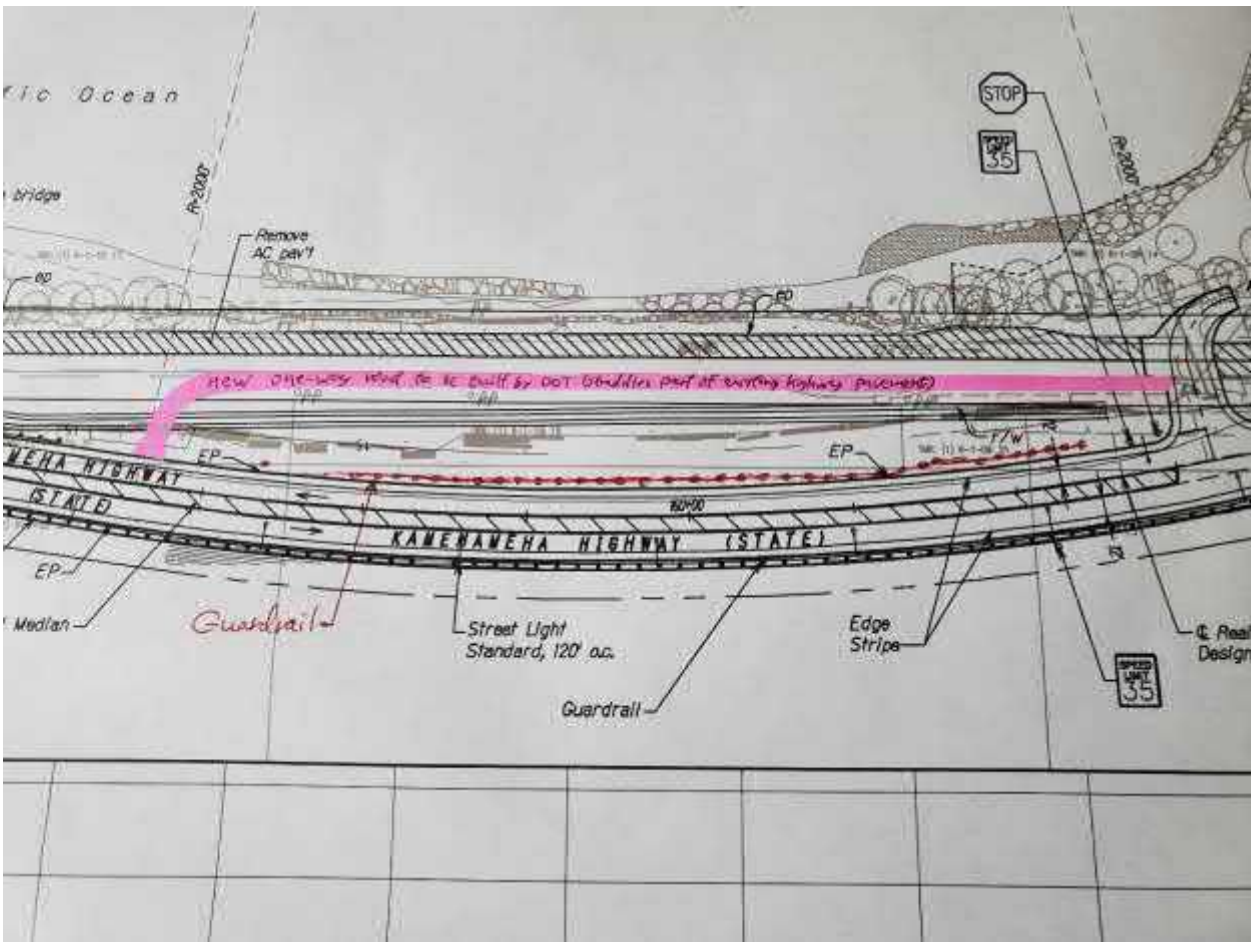
I support the proposed highway realignment. However, I am concerned about the safety and traffic impacts of the DEA proposal to allow unregulated vehicle access from the makai side of the realigned highway. Based on DEA figures, the Preferred Alternative could allow left and right turns from, left and right turns onto, and even vehicles backing onto roughly 600 to 700 feet of realigned highway mauka of Laniakea Beach. All of these turning movements currently occur on the existing highway.

To avoid pilikia, I suggest that the DOT modify the Preferred Alternative by:

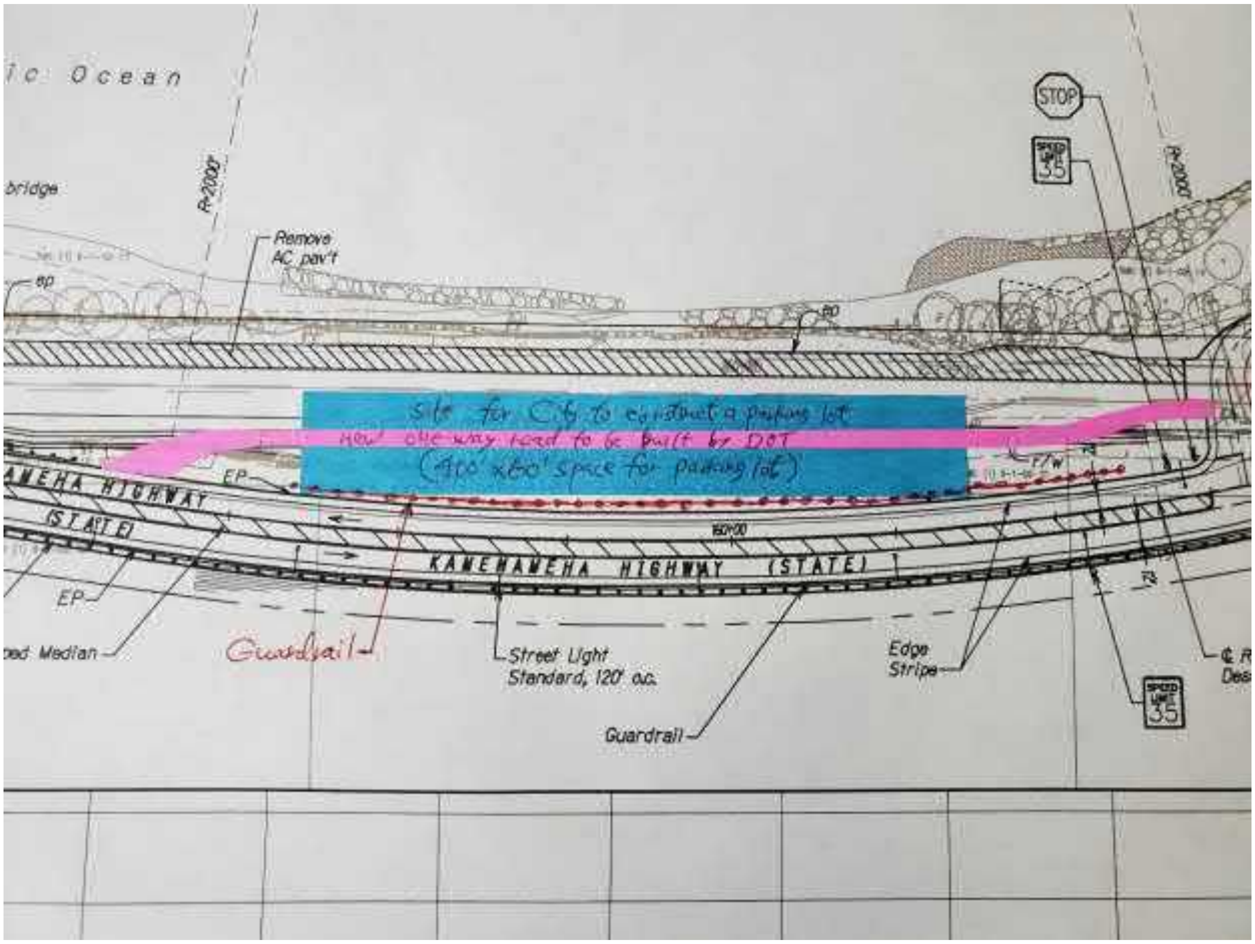
- Providing a one-lane one-way road for vehicle access to unimproved property makai of the realigned highway. (To encourage dialogue, I have prepared figures which illustrate two conceptual alignments. There are many other reasonable alignments. Costs could be reduced for the conceptual alignment shown in Figure 1 by including a strip of existing highway pavement as part of the one-way road. The conceptual alignment shown in Figure 2 could facilitate development of a parking lot for 80 cars.)
- Allowing highway access from the proposed one-way road. (It would be desirable to allow both left and right turns onto the realigned highway. A competent engineer would need to determine where to locate and how to design highway access.)
- Restricting other vehicle access from the makai side of the realigned highway.

On page 2-14 the DEA stated that, “Any alternative that leaves Kamehameha Highway as a frontage road was rejected because HDOT cannot retain two parallel/redundant routes.” A DOT policy which prohibits parallel/redundant DOT routes for through traffic would not apply to a one-way road which has no function other than public access to scenic views and informal parking on DOT property makai of the realigned highway. Moreover, the DOT has constructed one-way access roads for scenic pullouts along other state highways.

CONCEPTUAL ONE-WAY PARKING ACCESS ROAD FIGURE 1



CONCEPTUAL ONE-WAY PARKING ACCESS ROAD FIGURE 2



I request modification of the Preferred Alternative to include reconfiguration of guardrails and retention and repurposing of a continuous strip of existing highway pavement to provide westbound bicyclists with a continuous off-road route along most of the project area. By comparison, the Preferred Alternative currently proposes:

- retention and repurposing of a wide strip of existing highway for a multi-use path mauka of Laniakea Beach. (I support this.)
- placement of guard rails and removal of pavement (mauka of Pohaku Loa Way) to prevent westbound bicyclists from exiting the realigned highway and riding westbound on the existing highway pavement to reach the proposed multi-use path.
- placement of guard rails and removal of pavement (west of the existing Lauhulu Stream bridge) without retaining a continuous westbound route for bicyclists to ride from the multi-use path onto the makai/westbound highway shoulder.

DEA figures for the Preferred Alternative show a 5-foot-wide paved shoulder on the mauka side of the realigned highway. I request modification of the Preferred Alternative to include a 7-

foot-wide paved mauka shoulder and pavement striping to create a buffered eastbound bike lane along the entire 0.5 mile project area. According to the "Honolulu Bicycle Facility Design Toolkit", where there is 7 feet of roadway width available for a buffered bike lane, the recommended configuration is a 5-foot bike lane and striping for a flush 2-foot-wide buffer.

Lastly, I request that the Preferred Alternative include some kind of modest improvements to make it safer and easier to walk from the highway pavement to Laniakea Beach. A stacked rock wall within the highway right-of-way, and subsequent wave damage, interfere with pedestrian beach access. I suggest that the DOT ask the DLNR to recommend appropriate mitigation. Simply removing the wall and loose rocks would be costly, accelerate erosion, and not necessarily improve pedestrian beach access. According to DEA Appendix D,

> *The rock rubblemound revetment transitions from the stacked wall at Turtle Beach and extends approximately 450 ft…. The rock revetment is a continuation of the stacked rock wall from the Turtle Beach reach with larger stone size and vertical height…. As designed, the wall is steep with well inter-locked stones. At damaged areas … stones have been scattered along the beach.*

COMMENTS ON STATE ACQUISITION OF CITY PROPERTY FOR HIGHWAY REALIGNMENT

The City acquired 3 acres of property mauka of the highway at Laniakea Beach because there was no space for parking, a comfort station, or showers makai of the highway. The City first obtained possession/control of this property by a court order on August 2, 1999. At that time the City did not prepare or apply for certification of a shoreline survey.

The Final EA should clarify whether the City owns property makai of the most recent (June 30, 2020) certified shoreline at Laniakea Beach. My understanding, which might not be correct, is that unless property boundaries have been determined by Land Court, shoreline certification determines the makai boundary of City shoreline property. If my understanding is correct, then the State owns and the DLNR has jurisdiction for property sandwiched between the existing highway right-of-way and the certified shoreline of City property.

The Final EA should address how §46-1.5(16)(B), Hawaii Revised Statutes, might affect State acquisition of City property for highway realignment. My understanding, which might not be correct, is that §46-1.5(16)(B) prohibits the City from disposing of shoreline property unless the City receives reasonably comparable property in compensation. It would be desirable for the Final EA to clarify whether the City can accept permanent jurisdiction for State property makai of the realigned highway in exchange for transfer of City shoreline property to the State.

> ***§46-1.5 General powers and limitation of the counties.*** *Subject to general law, each county shall have the following powers and shall be subject to the following liabilities and limitations: ... (16) Each county shall have the power to purchase and otherwise acquire, lease, and hold real and personal property within the defined boundaries of the county and to dispose of the real and personal property as the*

interests of the inhabitants of the county may require, except that: ... (B) No property bordering the ocean shall be sold or otherwise disposed of....

On page 3-14, the Draft EA disingenuously alleges:

The Pedestrian Shift Alternative has been designed to avoid and minimize impacts to the City DPR's undeveloped park parcels to the degree possible. However, this Alternative impacts the Laniakea Beach Support Park to the extent that may require redesign of the facilities described in the EA [January 2005 Final EA for Laniakea Beach Support Park].

The Final EA should instead acknowledge that if the DOT does not acquire all City property mauka of Laniakea Beach any remnant City property mauka of the realigned highway could never be used to provide parking, a comfort station, or showers for public use of Laniakea Beach. In fact it is unlikely that the City would have any use for remnant City property mauka of the realigned highway.

COMMENTS ON PERMITS REQUIRED FOR THE PEDESTRIAN SHIFT PREFERRED ALTERNATIVE

DLNR certification of a new shoreline survey will be required to determine the mauka boundary of the State Conservation District and the makai boundary of the City special management area and shoreline setback area mauka of Laniakea Beach. Under §13-222-11(a), Hawaii Administrative Rules, the DOT's July 30, 2020 shoreline certification is no longer valid.

§13-222-11 Validity of certified shoreline. (a) Certification of the shoreline shall be valid for a period no longer than twelve months from the date of certification, except where the shoreline is fixed by artificial structures which have been approved by appropriate government agencies….

DEA Table 2.1 alleges that:

Portions of the project are within the Conservation District, based on Shoreline Certification July 20, 2020. Because all project elements makai of the shoreline are within the existing roadway right-of-way, the State Highway exemption codified in HRS 264-6(2) applies. Conservation District design review or approval is not required for the project.

§264-6(2) concerns DOT regulation of the highway right-of-way. Possibly some other statute or rule exempts the highway right-of-way from Conservation District design review. But I doubt the DOT has carte blanche to construct structures within the highway right-of-way which would permanently relocate and artificially fix the shoreline further makai.

When a public hearing is scheduled on the DOT's application for a SMA permit and shoreline variance, I plan to request City permit conditions which require that:

- the public will be allowed to park mauka of the existing highway at Laniakea Beach for as long as possible until this would interfere with safe construction of highway realignment.
- starting when the realigned highway is open to traffic, for as long as the realigned highway continues in use, the DOT will allow public vehicle access to and parking on public property between Laniakea Beach and the realigned highway.

COMMENTS ON PROPERTY MANAGEMENT FOLLOWING HIGHWAY REALIGNMENT

The DEA does not adequately address the proposed management of property makai of the realigned highway. I request that the description of the Preferred Alternative in the Final EA include a figure which shows the boundaries of property and a list of improvements makai of the realigned highway which the DOT proposes should be controlled, managed, and maintained by the City. I also request that the Final EA clarify proposed long-term property management if the DOT and the CIty do not agree on transfer of jurisdiction. Specifically:

- Will the DOT allow public vehicle access and parking on unimproved property between Laniakea Beach and the realigned highway?
- Will the DOT allow the City to provide, maintain, and manage portable toilets, showers, and lifeguard stands between Laniakea Beach and the realigned highway?
- Will the DOT maintain state improvements, pick-up trash, remove abandoned vehicles, manage vendors, and roust squatters on property under DOT jurisdiction makai of the realigned highway?

COMMENTS ON TRAFFIC IMPACTS FOLLOWING HIGHWAY REALIGNMENT

Upstream highway bottlenecks limit downstream highway traffic volume. Fixing upstream bottlenecks without addressing downstream bottlenecks can worsen traffic queues and delays at downstream bottlenecks. This probably will happen to eastbound traffic after Kamehameha Highway is realigned mauka of Laniakea Beach.

DEA Appendix B includes figures and tables showing Wednesday and Saturday afternoon eastbound and westbound travel time between Haleiwa and Waimea in January 2020 (with public parking mauka of the highway at Laniakea Beach). It would be interesting and helpful if Appendix B in the Final EA also included figures and tables showing Wednesday and Saturday afternoon eastbound and westbound travel time between Haleiwa and Waimea when DOT jersey barriers prevented public parking mauka of Laniakea Beach. This would allow comparison of eastbound travel times with public parking and without public parking mauka of Laniakea Beach.

On a Sunday afternoon in June 2015, two months before the DOT removed its jersey barriers from the highway right-of-way, my wife and I left my high school 50-year reunion picnic in Malaekahana and drove along the North Shore back to Haleiwa. We observed a slow stop-and-go eastbound traffic queue from the Haleiwa Bypass to Sunset Beach. We also observed a slow stop-and-go westbound traffic queue from Waimea Bay to just west of the last place you could see the ocean at Laniakea Beach. My ad hoc data-free analysis is that the DOT prohibition on parking mauka of Laniakea Beach did not significantly affect eastbound travel delay on that Sunday afternoon.

COMMENTS ON THE NO BUILD SETTLEMENT ALTERNATIVE

I request that the Final EA include a public update on the details and status of the proposed Settlement Alternative. I also suggest that the Final EA point out that neither DOT consent nor a lawsuit settlement are required for the City:

- to obtain jurisdiction to manage State DLNR property sandwiched between the highway right-of-way and the certified shoreline of City property;
- to prohibit tour buses from unloading passengers on DLNR and City property mauka of the highway right-of-way at Laniakea Beach; and
- to place a fence slightly mauka of the highway right-of-way with appropriately sized gaps for vehicular and pedestrian access to unimproved DLNR and City property.

COMMENTS ON THE TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE

Closure of all public parking near Laniakea Beach for an indefinite multi-year period would:

- discourage most Oahu residents from visiting Laniakea Beach;
- not comply with coastal zone management policies under §205A-2(c)1)(B)(iii & v), Hawaii Revised Statutes; and
- probably provoke another lawsuit under §205A-6, Hawaii Revised Statutes.

CHAPTER 205A
COASTAL ZONE MANAGEMENT

> ***§205A-2 Coastal zone management … policies.*** *…*
>
> > ***§205A-2(c)(1)(B)(iii***) *Providing and managing adequate public access … to … shorelines with recreational value …*
> >
> > ***§205A-2(c)1)(B)(v)*** *Ensuring public recreational uses of … shoreline lands and waters having recreational value ...*
>
> ***§205A-4(b)*** *The … policies of this chapter … shall be binding upon actions within the coastal zone management area by all agencies….*
>
> ***§205A-5(b)*** *All agencies shall enforce the … policies of this chapter….*
>
> ***§205A-6 Cause of action. (a)*** *Subject to chapters 661 and 662, any person … may commence a civil action alleging that any agency:*

(1) Is not in compliance with one or more of the … policies … provided … by this chapter….;

§205A-6(c) *A court … shall have jurisdiction to provide any relief as may be appropriate, including a temporary restraining order or preliminary injunction….*

The Final EA text and summary tables should be revised to explicitly state that closure of public parking mauka of Laniakea Beach for an indefinite multi-year period would have a "significant effect" under §11-200.1-13(b), Hawaii Administrative Rules. An agency action which discourages most Oahu residents from visiting Laniakea Beach for an indefinite multi-year period would curtail beneficial uses of the environment, conflict with the State's statutory environmental policies (i.e. coastal zone management policies), and have a substantial adverse effect on community cultural practices (i.e. public recreational use of shoreline lands and waters at Laniakea Beach).

§11-200.1-13 Significance Criteria. *…*

(b) … In most instances, an action shall be determined to have a significant effect on the enviroment if it may: …

(2) Curtail the beneficial uses of the environment;
(3) Conflict with the State's environmental policies … established by law;
(4) Have a substantial adverse effect on the … cultural practices of the community….

COMMENTS ON REGULATION OF PARKING MAUKA OF LANIAKEA BEACH

Some of the summary tables in the Draft EA imply that all public parking mauka of Laniakea Beach is not legal. This is incorrect. Neither the City, the DLNR, nor private property owners have prohibited the public from parking on property which abuts the highway right-of-way near Laniakea Beach. The DOT cannot regulate parking outside the highway right-of-way. And City attorneys, on several occasions, have directed HPD not to issue parking tickets to vehicles parked outside the highway right-of-way mauka of Laniakea Beach.

Unless the DOT authorizes parking, or unless the DOT authorizes another agency to manage/control the highway right-of-way, §264-6(2), Hawaii Revised Statutes, prohibits parking within the highway right-of-way.

§264-6 State highway not to be disturbed without permit. *No person or government agency, whether federal, state, or county, shall, in any manner or for any purpose do any of the following acts without a written permit from the director of transportation or the director's authorized representative: …*

(2) Place, erect, leave, or store any … motor or other vehicle … wholly or partially within the right-of-way of any state highway….

When there is no other place to park for public beach access, most Oahu residents, including myself, believe that the DOT should allow the public to park on the unpaved shoulders of rural State highways. From a practical standpoint, enforcement of DOT parking prohibitions is problematic when it is difficult to determine whether a parked vehicle is within or outside the highway right-of-way.

PAU

Mahalo for this opportunity to comment.

Douglas Meller

DOUGLAS MELLER

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Tuesday, August 24, 2021 6:33 PM
To: Tyau, Brian
Cc: Kuwaye, Kristen; McClellan, Malie
Subject: RE: Draft Environmental Assessment Announcement for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea

Dear Mr. Tyau,

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should Hawaiian Electric have existing easements and/or facilities on the subject property or within the State's right of way, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Kamehameha Highway Pedestrian Safety project comes to fruition, please continue to keep us informed.

Should there be any questions, please contact me at 543-7245.

Thank you,
Rouen Liu
Permit Engineer

From: Joanne Martin <jmartin@stanford.edu>
Sent: Monday, September 13, 2021 9:39 AM
To: Tyau, Brian
Cc: Beau Sheil; Adams, Rachel; McClellan, Malie; Tatsuguchi, Ken
Subject: Re: [EXTERNAL] Re: Draft Environmental Assessment Announcement for the Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea

Brian, Thank you. I do hope you all will seriously consider extending the exit beyond Chun's reef beach park, where severe traffic problems are already evident at times. It costs more now, but extending it later -- which will be necessary, as it just shoves off the traffic problem a bit down the road -- will cost more in the long run. Joanne Martin

From: Joe Wat <joe@kokuahawaiifoundation.org>
Sent: Tuesday, August 31, 2021 11:07 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea Ped. Project: Comments

Aloha,

I just wanted to hop into the comments to say that Laniakea beach traffic has been a huge problem for my work. Coming from schools in Pūpūkea it has sometimes taken me an HOUR to get to Haleʻiwa with traffic starting at Foodland!

This impacts how much work I can get done and costs me hours and hours of unpaid commute time and time with my family and friends. I am excited to see this project go forward and hope it makes Koʻolauloa a little more livable for residents.

As part of this project, please budget for LARGE SIGNAGE describing the rules around turtles! While driving past I regularly see tourists harassing the turtles... if they will be funneled through a parking lot entry/exit, more intentional pathways etc please give them signage and more information around regulations!

Mahalo,
- Joe

--

Joe Wat
ʻĀINA In Schools Program Coordinator
Kōkua Hawaiʻi Foundation
PO Box 866, Haleiwa, HI 96712
(808) 638-5145 Office

joe@kokuahawaiifoundation.org
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Are you a member? www.kokuahawaiifoundation.org/membership
Become a volunteer: volunteer@kokuahawaiifoundation.org

KAMEHAMEHA SCHOOLS®

September 22, 2021

VIA EMAIL ONLY (brian.tyau@hawaii.gov)

Brian Tyau
Department of Transportation
869 Punchbowl Street, Room 301
Honolulu, Hawaiʻi 96813

Re: Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Draft Environmental Assessment ("EA") Scoping and Request for Comments
Haleiwa, Island of Oʻahu, Hawaiʻi

Dear Mr. Tyau,

Thank you for the opportunity to comment on the Draft Environmental Assessment ("EA") for the project proposed by the State of Hawaiʻi Department of Transportation, Highways Division ("HDOT") to address pedestrian safety in the area of Laniakea Beach ("Project"). Kamehameha Schools ("KS") concurs with HDOT's intent to re-prioritize pedestrian safety, while reaching a resolution that is sensitive to and accommodates all of the concerns in the area, including several cultural sites. With the above in mind, please find below a list of questions and concerns that KS would appreciate if you could address.

1. **Cultural Sites**. The Project has the potential to impact a cluster of traditional Hawaiian archaeological sites located at the northeastern end of the Project, including ceremonial and burial sites. Among these sites is the Kahōkūwelowelo Heiau.

The Cultural Impact Assessment ("CIA") upon which the EA is based incorrectly indicates that I Nui Ke Aho is the primary steward of Kahōkūwelowelo Heiau. KS is and has been the primary active steward of Kahōkūwelowelo Heiau for over the last 10 years. KS coordinates and collaborates with numerous community groups and educational institutions in this regard. For instance, KS has developed educational programming at Kahōkūwelowelo Heiau with the University of Hawaii at Manoa and the KS Kapālama Campus. KS has an active land agreement with I Nui Ke Aho to ensure its members have regular access for cultural and educational use, and KS has hosted the Polynesian Voyaging Society to engage in traditional and cultural practices at the site. KS has hosted numerous community meetings to develop restoration strategies for the site in partnership with the community and has recently begun native plant restoration at the site. Finally, KS has worked with KUPU and I Nui Ke Aho on mālama ʻāina projects at the site.

KS recommends that the EA/CIA be revised to reflect the accurate status of the stewardship of Kahōkūwelowelo Heiau as set forth above, and KS continues to recommend that these cultural sites be avoided and that appropriate site buffers be created to mitigate any direct and non-direct impacts to the site and associated cultural practices.

2. **KS Lands**. The EA indicates that 2 KS parcels are to be acquired by HDOT for the Project, including TMK Nos. 6-1-010:020 and 6-1-009:022; however, it is unclear whether the existing infrastructure and improvements (such as fencing and water lines) will be impacted. It is also unclear if existing agricultural tenants on these parcels will be displaced or if access to adjacent KS lands will be impacted. KS needs to be assured that it has access to its surrounding lands off Kamehameha Highway and that the agritulcultural uses of its longtime tenant, Kawailoa Ranch, will be adequately addressed. Any access, infrastructure, and/or improvements that are impacted by such condemnation should be relocated and/or replaced at the sole cost of HDOT. KS recommends that the EA be revised to provide more detailed information on impacts to KS lands and tenants and to ensure KS access to its lands, infrastructure, and improvements.

3. **Ownership of Laniakea Beach**. The EA asserts that KS is the owner of Laniakea Beach and, therefore, there is no City owned beach recreation area to support. This is incorrect. In the Second Amended Stipulated Judgment filed on May 14, 2000 in Civil No. 99-2561-07 (the "Condemnation Order"), the City condemned that portion of Laniakea Beach owned by KS, also identified as TMK No. 6-1-010:-17. The conveyance has not been completed yet due to delays encountered on the part of the City. As far as KS is aware, the City still intends for this portion of Laniakea Beach to be conveyed to it pursuant to the Condemmation Order, after which KS will no longer hold any fee title to Laniakea Beach. The EA should be revised to reflect the foregoing.

4. **Pedestrian Safety**. The EA asserts that the Project would eliminate parking on the Mauka side of Kamehameha Highway, lessening the frequency of pedestrian highway crossing, but it is unclear whether there will be organized parking on the Makai side of Kamehameha Highway to ensure pedestrian safety and what steps will be taken to discourage or prohibit Mauka side parking. KS recommends that the EA be revised to further detail plans for pedestrian safety on the Makai side of Kamehameha Highway.

5. **Residential Projects.** On pages 2-2 and 3-12 of the EA, reference is made to three projects described in KS' North Shore Master Plan: Papailoa Residential Infill, Kapaeloa Residential Infill, and Kuikuiloloa Agricultural Area. The EA should clarify that KS is not actively pursuing any residential projects and that KS will seek community input before it considers pursuing such.

6. **Miscellaneous**.

Table 3-2 on page 3-14 of the EA needs to be corrected. The reference to TMK No. 6-1-005:023 should be changed to TMK No. 6-1-005:026.

Figure 2-11 on page 2-13 of the EA needs to be corrected. It incorrectly notes that KS is the owner of TMK No. 6-1-05-007. The reference should be to TMK No. 6-1-005:026.

Thank you for consideration. We look forward to your response.

Very truly yours,

KAMEHAMEHA SCHOOLS

Todd Gray
Land Asset Manager
North Shore - Haleiwa
Community and ʻĀina Resiliency

From: Laura Figueira <figueira@hawaii.rr.com>
Sent: Wednesday, September 22, 2021 1:46 PM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Re: Draft Environmental Assessment (Draft EA) for the Kamehameha Highway Pedestrian Safety Project,

I am writing to express strong support for SDOT's preferred alternative, the pedestrian shift alternative.

As long time North Shore residents with a home approximately 5 miles north of the project site, my family and I have endured the interminable traffic congestion caused by pedestrian crossings at Laniakea for too may years. The only significant mitigation effort was SDOT's placement of parking barriers on the mauka side of the highway a few years ago. The relief was immediate but temporary, ended by a frivolous lawsuit led by a misguided attorney who audaciously called it a "quality of life" issue. I am sure I speak for thousands of actual residents who have had to deal with the consequences of the court's ruling, particularly in the many hours spent on the Haleiwa By-Pass or Kamehameha Highway trying to get to "town" or home to their families. Whose quality of life was enhanced by restoring the free parking but the thousands of tourists who flock there to swim with the turtles, certainly not the taxpaying residents!

Pedestrians are the very root of the congestion, therefore any proposal with crosswalks will not work!
The proposed realignment of Kamehameha Highway, up to 80 feet mauka from its current location from the Haleiwa side of Lauhulu Stream Bridge to the Haleiwa side of Kawailoa Stream Bridge is the most practical and effective plan to be proposed in years. Blocking parking on the mauka side of Kamehameha Highway and creating a multiuse path where the existing highway is currently located makes absolute sense. Providing up to 90 parking spaces between the multiuse path and the new, realigned highway should satisfy even the most vocal critics of the relief provided by the concrete parking barriers years ago. Moreover, the proposed realignment would provide coastal erosion protection for the highway which is already badly undermined and would minimize flooding of the highway now occurring during high surf seasons.

I would also like to express my gratitude to SDOT administration for its continuing effort to find a solution to this long standing traffic problem, made more complex at times by mixed signals from the community such as the unfortunate law suit. I assure you it was not a reflection of the sentiments of the vast majority of residents who are desperate for lasting relief from the traffic congestion. The SDOT's pedestrian shift alternative is the most promising solution in sight.
Mahalo,
Laura Figueira

NORTH SHORE NEIGHBORHOOD BOARD #27
c/o NEIGHBORHOOD COMMISSION • 925 DILLINGHAM BOULEVARD SUITE 106 • HONOLULU, HAWAII, 96817
TELEPHONE: (808) 768-3710 • FAX: (808) 768-3711 • INTERNET: http://www.honolulu.gov/nco

September 30, 2021

Brian Tyau
State of Hawaii, Dept of Transportation
Planning Branch
brian.tyau@hawaii.gov

Aloha Brian –

At the September 28, 2021 North Shore Neighborhood Board #27 meeting, the board voted to support the preferred Pedestrian Shift Alternative as discussed in the Laniakea Environmental Assessment (EA).

Discussion of the EA provided the following comments that we respectfully request be included in the EA and be addressed by the Dept of Transportation and their consultants.

Comments Submitted by the North Shore NB at the September 28, 2021 Meeting Regarding the Laniakea EA

- Board requests that their comments be incorporated into the final EA. The timing of the EA did not coincide with the July or September board meetings but the board should not be penalized and it is only just over a week past the deadline for comments. The Board represents the community and must be heard as part of the process.
- Who was consulted for cutlural concerns: Bishop Museum? UH, Other entitities? Road may infringe on these sites.
- Need to stop the tourists – they are harming the endangered species in the area (specifically the turtles).
- At one time these areass were not hardly used – now visitors have found these beaches. Hope current plans don‘t keep the area from its full potential.
- There will be a loss of parking and recreatiional use during construction. How can you accommodate and exepdite the timeline so people area kept away too long.
- Make sure you follow all the laws. Need to integrate environmental concerns into the Draft EA.
- Many concerns regarding the thoroughness of the various studies for flora and fauna especially as it results in a finding of no significant impact in the area. Feels the studies are lacking. What are the social and environmental impact?
- Outreach on cultural concerns was not a robust process. Only 4 people consulted out of a community in the area of 4,000?
- Purpose and need of the EA are focusing on an unlawful need. EA did not point oout alternatives like off site parking. Who is parking? Mostly tourists.
- What is the main priority (we are all over the place): traffic, access to the beach, marine wildlife, parking? How many people are coming to this area? What about parking by tour busses? Where does the bike path go – not connected to anything.
- Moving the road mauka – removed this type of construct in the Sunset Beach area due to high water concerns so now we are doing something contradictory?
- Put the barriers back.

- Can we incorpaote tours busses / vans in this plan?
- Did we consult with the City and County in the EEA Prep? Is this burden being shifted to another entitiy instead of solving the issue?
- Bike path fits in with overall bike plan for hte North Shore. Other parts of the path will eventually be built and connected. We will take the low hanging fruit to get it moving forward.
- There are a number of cultural sensitivities in the area that need to be addressed.
- Yes this is not the best answer but it is a compromise.
- There were lots of community meetings over the past 20+ years. The North Shore NB discussed this issue at every Transportation Committee meeting.
- Need alternatives for the tour busses to see turtles: Sea Life Park, the aquarium, etc.
- There is spill over into Puaena Point which is even more sacred than Laniakea.
- Need something done – this will only push the issue down the road – Chun'ʻs Reef will be the next bottleneck area.
- What are the dimensions of the revetment and other features (bike path, raodway)?
- How does the parking work? Will it be directed?
- Community must have access during construction.
- Can the work be done at night?
- What are the improvements you mention with street lights, drainage, cross street and driveway modifications? What does all of this mean?
- This area is highly utilized by the community and visitors.
- City and County Parking will be for the community (the interim settlement plan).
- Original proposals moved the road even further inland that would have affected cultural areas. DOT avoided cultural sites with this effort.
- Work at night will disturb residents and turtles.
- If you use Federal money it is very likely the Federal government will not allow this project to move forward.
- Concern for consulting was in relation to the cultural aspects of the project – DOT has a history of destroying cultural sites when building roads. Will a cultural monitor be involved? Has the State Historic Preservation Dept been involved?
- Draft EA states that the Waialua Hawaiian Civic Club was consulted but I never saw anything.
- What are the 6E requirements? Make sure all laws are bing followed especially related to the cultural aspects of this project.
- There are big waves and storm surges in the area, this is a big safety concern.
- Bike path will be gone by the time connections are built.
- Can't guarantee residents only parking
- Need enforcement of the laws in the area.
- People crossing the road are not breaking the law if there is no crosswalk.
- Likes the idea of construction at night otherwise there will be 18 months of hell for the community in driving through the area.
- What is legal or not legal does not matter if there is no enforcement.
- We need to look purposefully at moving people around the North Shore: shuttles for example.
- The road will be washed out no matter what we do – it gets washed out now.
- DOT did a good job with the various realignments and bridges along Kamehameha Hwy from Sunset over to Punaluu. Please apply this same effort and level of work to the Laniakea area project.
- NOAA has been on the sidelines and HTA has promoted the beach as a turtle viewing spot.

- Fine with closing the area for the project duration. Consider a viewing platform for visitors – it will be boring and they will go elsewhere.
- Need to amend the EA to include mechanisms for discouraging turtle viewing.
- FONSI is the wrong determination based on factors that are missing from the EA.
- Who manages the turtles? This is not a task for DOT.
- Lights are required for night work and could negatively impact the turtles.

We greatly appreciate the presentation and the opportunity to provide input and support to this project.

Mahalo,

Kathleen M. Pahinui
Chair, North Shore Neighborhood Board #27

Cc: Jade Butay, Director of Transportation, State of Hawaii
Ed Sniffen, Deputy Director of Highways
Ken Tatsuguchi
Senator Gil Riviere
Representative Sean Quinlan
Council Member Heidi Tsuneyoshi

From: Mahea Holzman <maheaholzman@gmail.com>
Sent: Monday, September 20, 2021 8:12 PM
To: Tyau, Brian
Cc: patholzman808@gmail.com
Subject: [EXTERNAL] Laniakea

Aloha Brian,

We support the Pedestrian Shift Alternative. To all the benefits of this alternative that DOT outlined, we would like to add one more.
The current problems at Laniakea seem to be bigger than we can handle. Most of the information on the internet about this beach is written by one-time visitors: for example, reviews on Google Maps, Yelp, Trip Advisor, and articles posted by countless travel bloggers in many languages. What they have posted in the past such as, "I swam with a turtle!" and "You must go to Laniakea!" will never be voluntarily updated. Whatever all of us do, including the State, City, NOAA, HTA, elected officials, residents, activists, volunteers, and the media, may never be enough to reverse that course.
Closing the parking of Laniakea for the duration of the construction may be the only way to reset and reintroduce Laniakea to the world. When construction is over, a portion of the old mauka lane (new pedestrian lane) may be turned into a turtle viewing platform with signs asking visitors not to go down to the beach to view turtles. Since the beach is small, the visitors should be able to see turtles clearly. Yet, hopefully, many tourists will decide it's not worth driving to Laniakea if they can't take selfies with turtles or swim with them. Surfers and other ocean users should be allowed to walk straight out to the sea, perhaps using a designated path. We fear that unless we find a way to reduce the number of turtle tourists, no amount of parking spaces will be enough, and the chaos will continue.
A viewing platform is an effective way to prevent marine wildlife harassment from happening, already proven in California.

Sincerely,

Patrick and Mahealani Holzman
Both of us grew up in Hawaii and have been
North Shore residents for over 10 years
59-452 Makana Rd
Haleiwa Hi
96712
808-227-6224

From: Racquel Hill-Achiu <rhachiu@gmail.com>
Sent: Wednesday, September 22, 2021 9:34 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea Comment

Aloha Brian,
I hope it's not too late to submit a comment regarding Laniakea.
My name is Racquel Hill-Achiu, born and raised on the North Shore, specifically in the immediate/surrounding area of Laniakea. These are my stomping grounds.
When i was growing up, Laniakea had significant Naupaka and large, tall trees (I believe they were ironwood) that lined the roadside - blocking immediate view, limiting access AND supporting the land from erosion.

It is my genuine hope that it is realized that the Laniakea issue does not need to be drawn out (unnecessarily) any longer. The easiest, proven resolution would be to replace the barriers. No realignment, no pedestrian bridge, no additional roadways ...just simple replacement of the barriers.

The more adjustments and accommodations that create more space and flow just generate more people//traffic.
Leave the area untouched and just replace the barriers. It's proven effective, its readily available, far more cost effective than what has been considered/proposed.

Not long ago, Sunset Beach roadside parking /access was blocked off due to erosion concerns. So my question would be, why then would we consider doing just the opposite at Laniakea? I don't understand. Once you put parking and access directly fronting Laniakea, because its an established "parking"/access area, when the waves are big or conditions are unsafe...people will still utilize the space because its there! Vs the way it currently works is when the area is threatened by high surf/weather conditions the area is closed off or at the very least unable to stay in the area for any period of time.
Also, it would be irresponsible of me to not acknowledge the significant cultural impacts to various sites in the immediate area should a realignment or road addition be implemented.

Please consider just replacing the barriers (with planting of plants that can provide additional barrier and ground support) , save us from anymore excessive costs (that seem to just grow)

I appreciate your time in accepting my comment.

MAHALO NUI
Racquel Hill-Achiu

From: Sandra Cashman <cashmansandra@gmail.com>
Sent: Thursday, September 23, 2021 10:02 AM
To: Tyau, Brian <brian.tyau@hawaii.gov>
Subject: [EXTERNAL] Laniakea Traffic Proposals

Aloha,

I'd like to comment on the proposals in relation to the Laniakea traffic situation. I know this is a day late, but unfortunately I was only made aware of this opportunity in the North Shore News which arrived at my home yesterday. I didn't read it until this morning. I read the Star Advertiser daily and keep close tabs on this issue, so I'd appreciate more of an effort to be sure that community members are aware of chances for input.

No Build alternative: it doesn't address the traffic issue. It only applies to shoreline erosion.

No Build Settlement alternative: this seems like a good interim measure, not a replacement for a more permanent solution, but a feasible mitigation effort that could be accomplished quickly.

The Transportation System management alternative: this sounds like the barrier system tried previously which did alleviate the traffic (At that time the Tourist Association also agreed to stop tour busses and vans from stopping at Laniakea, so that added to the impact). Would this be subject to lawsuits? This plan lacks the crosswalks which seem like a good safety feature in the No Build Settlement alternative.

Realignment alternative: this is of course the preferred solution, but has been given a timeline of 15 years. Residents of the North Shore have been promised a realignment solution over and over again in community meetings and it's always a sliding ten years in the future. So if this is the solution chosen, it needs to be paired with one of the other alternatives (No Build settlement or Transportation System management) to be at all meaningful.

Although one day late, I hope that my input can be considered. Mahalo.

Sandra Cashman
59-575 Akanoho Place
Haleiwa, HI 96712

From: SARA ACKERMAN <saraackerman@me.com>
Sent: Monday, September 20, 2021 8:32 PM
To: Tyau, Brian
Subject: [EXTERNAL] laniakea

Aloha Brian,

For the Laniakea plan, I strongly support the pedestrian shift option. I was born and raised in Hawaii, taught at Kahuku high for many years and have seen the sad transformation of the north shore, most especially at Laniakea beach. Just today when I passed, there was some guy in a U-haul who had set up a little stand to sell pineapples that it looked like he bought at Costco, and tourists swarming. I also suggest that the beach be closed to tourists/turtle harassers during construction to give the turtles a rest. As well as the residents of the north shore, who have for almost 20 years endured gridlock traffic so tourists can cross the road and harass turtles. Any plan that doesn't take this into account, and still allows for the tourists to cross the road is a waste of time and money. PLEASE MAKE THE RIGHT DECISION!

Thank you,

SARA
ACKERMAN Author of Hawai'i Historical Fiction Radar Girls Red Sky Over Hawaii
The Lieutenant's Nurse Island of Sweet Pies and Soldiers AckermanBooks.com
"Those who dwell among the beauties and mysteries of the earth, are never
alone or weary of life." — Rachel Carson

From: Stanford Brown <sbrown@rtsconsulting.com>
Sent: Tuesday, August 31, 2021, 10:32 AM
To: Tyau, Brian; Emma Brown
Subject: [EXTERNAL] Public Commentary OPEN for Laniakea Ped. Project Comment

Aloha Brian Tyau,

As a businessman and North Shore resident, I support the Kamehameha Highway Pedestrian Safety Project, and as a taxpayer, I suggest the additional measure of charging a minimum of one dollar per vehicle for parking in the new parking lot. I am grateful for the steps being taken to prepare for the future and mitigate traffic and pedestrian death, along with the environmentally and culturally responsible construction practices. Hawaii's natural beauty holds both intrinsic and economic value, and it makes sense that the cost of this project and/or further restoration and preservation of the area be supported by those tourists who frequent this popular tourist destination given limited budgets. We should be encouraging visitors to invest in its preservation for years to come, including, if possible, planning for the entire 6 feet of conservatively predicted sea level rise by the end of the century. Such measures have been successful in other locations like the Pali lookout.

Aloha Ke Akua,

Stanford R. Brown, B.Sc., CSP, CSHP, CRSP, CHSC
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Phone: (808) 375-3588

September 21, 2021

Sent via email to: *Brian.Tyau@hawaii.gov*

Mr. Brian Tyau
Highways Division
Hawai'I Dept. of Transportation
869 Punchbowl St.
Honolulu, HI 96816

Re: Comments on 2021-08-23-OA-DEA
Proposed HDOT Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach, O'ahu

Dear Mr. Tyau:

I am providing my personal comments on the Draft Environmental Assessment referred to above. I am a lifelong Oahu resident, my family has owned a home on the North Shore since 1960, I owned another personal residence on the North Shore between 1985 and 1997 and I have regularly and actively used the ocean and coastal resources in the Laniakea area for over 50 years.

SUMMARY

I fully support the stated purpose of the project as well as the Pedestrian Shift Alternative. However, my concern is that it be reviewed, planned and constructed consistent with public safety and Hawai'i's Coastal Zone Management Act, Hawai'i Revised Statutes ("H.R.S.") Chapter 205A (the "CZMA"), especially as they relate to access to coastal recreational resources.

This appears to be a multi-year project with an unpredictable timeline. It also appears that the preferred "Pedestrian Shift" alternative calls for the complete closure and elimination of parking across from Laniakea on the City's Laniakea Beach Support Park parcels: 6-1-010-019, 6-1-009-021and 6-1-005-024 (collectively the "Park parcel") for an indefinite period of time - at least two years - during construction. I believe this would be contrary to both the letter and spirit of H.R.S. Chapter 205A and would create unsafe pedestrian and vehicle conditions during construction.

I therefore believe that the project must include mitigation measures to address both of these impacts during construction and that the Final EA must be expanded to seriously consider such mitigation. It must also clearly and in a detailed manner discuss and commit to providing adequate replacement parking and coastal access opportunities upon completion of construction.

DISCUSSION

Background

Laniakea Beach lies adjacent to Kamehameha Highway. Across the highway from the beach lies the 3-acre unimproved Park parcel owned and managed by the City and County of Honolulu's Department of Parks and Recreation. Laniakea is one only seven North Shore beaches that have full-time City lifeguards monitoring the offshore waters.

Laniakea is a unique surfing break offering waves which are not available elsewhere on the North Shore. When there is a very large swell from the northerly direction, most other surfing breaks are "closed-out" and unrideable while Laniakea remains surfable with very long, perfect, world-class "right-hand" breaking waves.

According to the most recent State of Hawaiʻi Data Book, Laniakea is visited by more than 400,000 people annually. On a day when the surf is good, there can be more than 100 enthusiasts enjoying the waves in the area, not to mention other beachgoers.

The clear, level and open gravel and sand parking area on the Park parcel has been used in excess of 50 years by a variety of surfers, boogie-boarders, kayak paddlers, stand-up paddle (SUP) boarders, swimmers, snorkelers, fishermen, beach-goers, picnickers and tourists. Historically, that much-needed parking and recreational equipment unloading area has been integral to their coastal access. Furthermore, this parking area is now a significant historical and cultural site because of its long use as a gathering place and staging site for traditional cultural activities along the coast.

The Legal Imperatives

Through the State Constitution (Article XI) and the Hawaiʻi Revised Statutes (in particular Chapter 205A), the State of Hawaiʻi place special controls along the coastline to prevent the loss of valuable public assets and resources and to ensure that adequate access to public beaches, recreation areas, and natural reserves is provided. It is official State policy that its agencies preserve, protect, and where possible, restore the natural resources of the coast and the public's ability to use them. State law prohibits any interference with shoreline access in violation of the objectives, policies, and guidelines set forth in the CZMA, and imposes strict protocols and permitting procedures.

The CZMA specifically protects surfing sites and other coastal recreational activities through a series of mandates that are "binding upon actions within the coastal zone management area by all agencies." Those mandates require agencies, including HDOT, to:

1. Consider the importance of public coastal access and the availability of unique recreational and cultural activities in those areas;

2. Provide coastal recreational opportunities accessible to the public;

3. Protect beaches for public use and recreation.

4. Protect and preserve those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiʻian history and culture;

5. Protect coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

6. Require replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged;

7. Provide and manage adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

8. Provide an adequate supply of shoreline parks and other facilities suitable for public recreation.

In addition, through the Oahu General Plan and the North Shore Sustainable Communities Plan promulgated under State law, access to the shoreline and improved parks, parking areas, and supporting facilities must be increased whenever possible - not reduced.

<u>Beach Parking Issues Along the Entire North Shore</u>

Data suggests that half of all of the (pre-COVID) 5 million annual visitors to O ahu make their way to the North Shore and travel along 2-lane Kamehameha Highway to see and enjoy the beaches. These numbers help illustrate why there is a sense that it is "crowded" and why it is becoming more difficult for over 1 million local residents and families to go to beaches that they cannot walk to from their homes.

Along the roughly five-mile stretch between Waimea Bay Beach Park to Haleʻiwa Aliʻi Beach Park there are approximately 225 City and County of Honolulu paved and marked (painted) parking stalls, as follows: Waimea Bay Beach Park (75 paved, marked parking stalls); Haleʻiwa Beach Park (75 marked stalls); and Aliʻi Beach Park (75 marked stalls).

In order to safely access the public beaches along this corridor, beachgoers must do their best to access those mere 225 stalls while also competing for parking with commercial tour buses, tour vans, surf school vehicles and the like. If beachgoers miss out on an official parking stall, they are left to fend for themselves along the muddy, unsafe shoulder of Kamehameha Highway (usually within HDOT's 60-foot wide right-of-way) or in the neglected, unpaved and unmarked lots at City Park's-owned properties at Laniakea, Chun's Reef, Leftovers and nearby Lower-Uppers.

This type of opportunistic "free-for-all" parking increasingly occurs from the Haleʻiwa side of Laniakea all the way to Velzyland to the Northeast of Sunset Beach, which is the upper limit of popular North Shore surfing sites. Because of the North Shore's popularity and the limited available parking, North Shore and O ahu residents are losing effective access to many North Shore beaches.

Those limited parking areas which do exist lie closer to the highway than the current Laniakea parking area and are generally less safe and convenient to access, are further away from the shoreline access points and have a much more limited number of parking spaces. Limitations on the availability of parking and areas for the unloading of ocean gear (canoes, surfboards, stand-up surfboards, kayaks, paddleboards, beach wheelchairs, etc.) are significant constraints on recreational ocean access on O ahu, particularly on the North Shore. So the traffic and pedestrian safety issues that exist at Laniakea are really just a small part of a systemic problem, not a localized one.

<u>Pedestrian Safety Issues During Construction</u>

While the project's stated goal is to enhance pedestrian safety, I am extremely concerned that even more dangerous pedestrian conditions will be created if, even temporarily during the (best-case) two years of construction, the existing parking at Laniakea is totally eliminated.

With no alternative parking provided, beach-users will be forced to park along the highway shoulder (either legally or illegally) to reach this special coastal area.

When parking was eliminated by the barricades which were in place between December 2013 and August 2015, pedestrians were forced to navigate along the narrow highway shoulder for long distances pushing strollers, rolling wheelchairs, and carrying surfboards, kayaks, and SUP and windsurfing boards and equipment. In addition, people who parked along the mauka shoulder continued to haphazardly cross the highway to reach the beach. With shoulder parking stretching out several hundred yards on either side of the beach, the crossing danger was also more spread out and unpredictable to motorists. On October 27, 2014, with the barriers in place, a serious auto/pedestrian accident occurred on the makai side of the roadway in the vicinity of the Park wherein a motorist struck three pedestrians who were apparently attempting to access the Laniakea Beach while walking along Kamehameha Highway. I am attaching some photos to demonstrate this dangerous situation.

Elimination or reduction of the existing beach access parking at Laniakea in the name of "pedestrian safety," even temporarily, will actually just relocate the danger and increase it in adjacent areas. The safest alternative is really one that preserves or increases parking during construction.

CZMA Issues During Construction

The Draft EA provides only this brief and misleading discussion of the impact of the proposed project on parking and coastal access:

> *Although the informal parking on City property would be blocked during construction, the impact is temporary, and not a full restriction. Beachgoers can still use alternative modes of transportation (bus, bicycle, walk) or park at a different location.*

As I said, there is very little readily available parking elsewhere. The next available parking lot to the East is at Chun's Reef and it is very limited, frequently full and perilously close to the highway. The situation just gets worse heading toward Waimea Bay from there.

The next available parking lot back toward Ka'ena Pt. is at Hale'iwa Beach Park which has only 75 marked stalls that are already heavily used and much too far from Laniakea to be considered a feasible replacement.

There is very limited roadside parking elsewhere along Kamehameha Highway for miles in either direction and there are few side streets where such parking is permitted. In addition, that parking is already full on most days and will not provide any real relief to the displaced Laniakea parkers. Even if it were available, forcing beach-goers to park there would expose them, and their children, to the very real dangers of walking along the narrow shoulder for significant distances.

Suggesting the use of bus or bicycle transportation to access Laniakea is disingenuous and ignores the fact that traveling with a surfboard, kayak, SUP, paddle board or other large ocean equipment on buses is prohibited. It is also difficult and inadvisable on a bicycle, especially on a narrow substandard highway with no bike lanes, unless you're an accomplished circus entertainer.

In this regard, the HDOT proposal and the analysis of these issues in the Draft EA totally fail to satisfy its obligations to:

> *"Provide coastal recreational opportunities accessible to the public,"*
>
> *"Protect beaches for public use and recreation,"*
>
> *"Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area,"*
>
> *"Provid[e] and manag[e] adequate public access . . . to and along shorelines with recreational value."*

<u>See</u> H.R.S. §205A-2

In order to comply with the CZMA objectives, policies, and guidelines, the alternatives considered and chosen by HDOT must:

1. Preserve and enhance public parking and access to the coast, both during construction and as finally built, and

2. Preserve and enhancing the public's ability (again, both during construction and as finally built) to use and enjoy Laniakea Beach Support Park, the land for which the Hawai‘i First Circuit Court awarded to the City on August 2, 1999, as part of a series of condemnation actions intended to create and improve much needed public parks on the North Shore.

<u>The Need for Interim Mitigation of Safety and Coastal Recreation Access Impacts</u>

HDOT has not discussed or even considered, mitigating its adverse construction impacts on the Park parcel and the recreational resources it provides access to. The summary provided on Table ES at page S-4 of the Draft EA, under "Mitigation/ Minimization/Avoidance Measures" simply states "None proposed." At Section 3.7, beginning on page 3-27, there is no discussion whatsoever addressing the years-long loss of a very heavily used resource that is ***essential*** for coastal recreational access in the area. This is despite the fact that this issue was specifically raised in several of the scoping comments included in Appendix A-1. Even the North Shore Chamber of Commerce was unanimous that "long period or periods of time with no parking at Laniakea just will not work" and asked HDOT to find a way to make alternative parking available.

If HDOT and its contractors cannot phase this project in a way that unequivocally preserves adequate public parking on the City Park parcel during construction, they need to find an alternative location for coastal access parking in the immediate vicinity. KSBE has a considerable amount of land mauka of the highway and one or more temporary parking lots could be set up on that existing, mostly flat and clear acreage. Acquisition of temporary construction (or even permanent) easements for that purpose can be included in the ROW condemnation proceedings that HDOT must undertake for any bypass. The current parking on the Park parcel takes up less than an acre. A convenient parking lot that accommodates 55-60 vehicles or more could easily be located somewhere on KSBE's adjacent parcel, TMK# 6-1-005-023, on a temporary basis for minimal cost considering the overall project budget.

HDOT is duty-bound to make every reasonable effort to come up with a solution that does not hinder or diminish the public's ability to safely enjoy recreational opportunities at Laniakea. The Final EA will be inadequate if it does not squarely deal with this.

<u>The Need for Mitigation after Construction</u>

And, of course, in order to comply with the mandates of the CZMA, the finished project, whatever form it takes, must permanently restore, if not increase and enhance, the existing level of parking. Some of the alternatives vaguely discuss "informal parking" as part of the finished project. Page 2-6 of the EA, discussing the Pedestrian Shift Alternative, states that "the makai side of the realigned Highway could accommodate parking with an estimated capacity of 90 cars in the 60-foot-wide by 400-foot-long space." However, there is no detailed rendering or analysis of whether this is really possible. The low-resolution drawings that are included (Fig. 2-7) seem to show in red ***less*** parking area available than on the diagram attached to Mr. Bill Quinlan's February 17, 2021 comment email (at Appendix A-1) which appears to extend further and shows only 50 spaces. I am concerned that the reference to "informal parking" seems more like token parking which will be inadequate to replace what will be eliminated by the project.

The Final EA should provide sufficient information, detail and measurements to demonstrate that ***at least*** the existing 50 to 60 parking spaces can be restored makai of the shifted highway. Otherwise, HDOT must consider permanent, as well as temporary, condemnation of sufficient land for replaced/enhanced parking on adjacent parcels. As noted above, there is ample space readily available on the adjacent parcel, TMK# 6-1-005-023.

CONCLUSION

I am hopeful that HDOT will take seriously its obligations under the CZMA, H.R.S. Chapter 205A. In order to comply with the law, and to be fair to the community, any solution chosen for this project must include appropriate accommodation for maintaining safe, easy public coastal access throughout and at the end of the process. The statutory imperative to consider and mitigate the negative impacts on recreational resources is clear. No project can legally go forward unless it does this.

Sincerely,

William W. Saunders, Jr.


TheBus
NO STOPPING
FEB
112


SPEED
LIMIT
35


NO
PARKING
ANY
TIME


RXE 066
RYJ 112
SBW 897


RYJ 112

Environmental Law Class
William S. Richardson School of Law
University of Hawaiʻi at Mānoa
2515 Dole Street
Honolulu, Hawaiʻi 96822
℅ Professor Denise Antolini
antolini@hawaii.edu

By Email to: September 22, 2021
Brian.Tyau@hawaii.gov
rachel.adams@wsp.com

Re: Comments on Kamehameha Highway Pedestrian Safety Project Vicinity of Laniākea Beach - Draft Environmental Assessment and AFONSI

Dear Mr. Tyau and Ms. Adams,

Under the direction of Professor Denise Antolini, the forty-five law and other graduate students in the Fall 2021 Environmental Law day and evening classes at the William S. Richardson School of Law, University of Hawaiʻi at Mānoa provide the following comments regarding the proposed Kamehameha Highway Pedestrian Safety Project Vicinity of Laniākea Beach (the "Project") Draft Environmental Assessment ("DEA") and Anticipated Finding of No Significant Impact ("AFONSI") prepared by WSP USA for the State of Hawaiʻi Department of Transportation ("HDOT") pursuant to Chapter 343, Hawaiʻi Revised Statutes ("HRS").

We appreciate your efforts to propose a project that focuses on a safer pedestrian environment at Laniākea Beach, while also protecting the natural and cultural environment. The multitude of problems in this sensitive area have become increasingly evident and worsened, despite years of community concern and prior stop-start efforts by DOT to address these issues and consider highway realignment options. Due primarily to the overly narrow scope of the DOT's "purpose and need," however, we conclude that this DEA does not fulfill the core purposes of HRS § 343-1, to "integrate the review of environmental concerns with existing planning processes of the State and counties," "to alert decision makers to significant environmental effects which may result from the implementation of certain actions," to encourage "cooperation and coordination," and to "benefit[] all parties involved and society as a whole" through robust "public participation during the review process."

The three main areas of concern as indicated below are: (A) "purpose and need" is too narrowly defined, (B) "significance" is under-estimated in several key areas, and (C) the alternatives examined are insufficient in scope and detail. Given these concerns, we recommend either that a revised DEA be prepared for another round of agency and public comment or that, due to the likely significance of the effects, an Environmental Impact Statement Preparation Notice ("EISPN") be commenced.

I. Summary of Comments

The proposed project lacks a coordination solution and collaboration with key state and county agencies – particularly the State Department of Land and Natural Resources, and the City and County of Honolulu Department of Parks and Recreation – as well as NOAA/USFWS, that own, manage, or have public trust responsibilities for the land and waters in the vicinity but also can offer substantial authority and resources to a long-term solution for people and nature.

A. Purpose and Need

The DEA narrowly defines the purpose and need as primarily increased pedestrian safety. This major shift in HDOT's historical approach to this problematic area is attributed, numerous times throughout the document, to one pedestrian accident (inexplicably without comprehensive data on overall traffic and pedestrian accidents) yet appears to be more driven by the availability of a specific source of state funding.

The DEA acknowledges that "pedestrians cross[ing] Kamehameha Highway" do so after "unlawfully parking on the mauka side of the road," yet the project has become aimed at accommodating such pedestrians without identifying which users are mainly responsible for the conflicts and why a large and increasing number of tourists/pedestrians come to this sensitive coastline that has a very small (and shrinking) beach that is already over capacity for visitors and has a highly eroded shoreline along the highway.

The purpose and need should be more broadly defined in collaboration with state and county agencies, and cultural and community organizations, to include: the need to reduce tourist traffic and visits to this location, to protect the wildlife from disturbance and harassment (particularly Honu and Monk Seals, which are federal and state protected species), to ensure resident access to recreational and cultural resources in this area, and to prevent spillover effects along the highway and into neighborhoods increased tourism and traffic. Residents and wildlife interests should have clear priority over commercial and tourism interests.

With a cramped purpose and need, the DEA ends up with an overly narrow vision of the problems and the alternatives to solve them. The preferred alternative solution may seem attractive with tunnel vision but does not provide a permanent, integrated approach to the complex pressures on this area, the prospects of continued shoreline erosion and sea level rise, nor relief for the affected community or wildlife.

B. Significance

As explained in the detailed comments below, on a number of issues, the DEA does not adequately analyze the potential significance of the impacts and an EIS should be prepared, as required by HRS § 343-3(c)(4). These key issues include: effects on protected species, cultural resources, climate change/sea level rise, and coastal resources (e.g., the visited areas of the beach and shoreline).

C. Alternatives

The limited purpose and need has in turn limited the range of reasonable alternatives considered in the DEA. Additional reasonable alternatives that would address the root causes of the traffic and pedestrian congestion – and reduce it rather than increase visitors to the area - should have been considered.

Some of these alternative ideas that should be explored, in light of a broader undersanding of purpose and need, and inviting coordinated agency-civic action and engagement, include the following five alternatives:

1. Reduced and Managed Tourism Alternative. The highway would be realigned mauka like the Pedestrian Shift Alternative (PSA) but with a makai "passive park" in the area of the existing highway and no parking would be allowed on the makai side of the highway (except for emergency responders, lifeguards, and law enforcement). All parking for tourists would be off-site (e.g., Meadow Gold or Haleiwa or Waimea Valley) and be fee-based; tourists could access the beach area only via a reserved shuttle (fee-based, operated by a community non-profit) with narrated tour and "pono practices" information to protect cultural practices and wildlife. Hawai'i residents only would be allowed to park only along the makai Highway on either side of Laniākea and would walk to the beach. Appropriate signage would restrict parking to Hawai'i residents only. Close the beach before sunrise and after sunset to non-residents (resident access only). Install permanent educational signs on the shoreline and beach. Implement a social media campaign that discourages cheap tourism, exposes bad behavior (e.g., wildlife harassment), and encourages ethical "regenerative" tourism. Install web cams to document misconduct and support law enforcement. This alternative would enhance the scenic beauty, prevent further shoreline erosion, allow natural retreat of the shoreline, support resident and cultural access, and reduce the overwhelming volume of tourists and their impacts.

2. Elevated Highway Segment. Instead of moving the highway mauka, elevate the 1000-foot segment by 10-20 feet to allow for natural erosion of the shoreline, protect the floodplain, streams/wetlands, enhance scenic drive-by views, and limit visitors to the site. This could set a valuable precedent for elevating other highway segments in Hawai'i that are inevitably at risk from sea level rise and coastal erosion. Allow parking only along the makai side of the highway at either end of the elevated segment for residents only. For tourists, institute the shuttle system and restrictions described in Alt 1. above.

3. Pedestrian-Bike Overpass. Build a pedestrian- and bike-only overpass (similar to the ones over the H-1 Freeway in town) with mauka parking in the city-owned lot for residents and the tourist shuttle (see 1. Above), add solid guard rails and fencing along the highway to prevent pedestrian crossings at grade. The added benefit of an overpass could be educational signage, viewpoints, and a fee could be instituted for tourists (to be used for staffing and marine life conservation on site) during peak times with an ambassador posted at both ends of the overpass and educational kiosks. This creates "management points" for access, enhances safety, relieves congestion, and protects the natural and cultural resources without a costly realignment.

4. Multi-Agency Alternative. Engage all federal, state, and county agency partners in a cooperative approach that seeks to solve more than just the pedestrian/traffic issues. Include the Hawaiian Civic Clubs and the ʻAhu Kiole (People's Council) for Oʻahu; use the ʻAha Moku Framework for Collaborative Management. Designate Laniākea as joint protected area of state-wide significance based on its unique cultural, recreational, and wildlife values. Utilize the City beach park land that is "banked" in this area for parking and strict tourism management (e.g., limited tourist shuttles from Haleiwa and reservation-only commercial island tour stops, like Haʻena). Ensure on-site active mangement by DLNR and NOAA for wildlife protection. Provide restrooms at the city parks but farther away from beach itself. Charge fees to visitors through a joint education center like Hanauma Bay and offer limited reserved guided tours of the coastline and expert Honu observation. Do not allow unmanaged access by tourists. At the education center, use pictures and murals of people modeling positive behavior, showing respect for and keeping distance from the turtles, people keeping within walking path, replanting native plants, picking up litter or placing litter in proper receptacles, and people taking the information they learned to educate those at home about environment preservation/regeneration. Invite local graffiti artists to donate their talents for the murals. Install a "biki" station here and in Haleiwa to allow tourists to bicycle to the area; complete the multi-modal bike path, along the highway makai shoulder, for all users.

5. Pohaku Loa Pedestrian Shift Path Alternative: Shift the location of the Pedestrian Shift Alternative 500 meters to the north, along Kamehameha Hwy. At the Northern intersection of Pohaku Loa Wa and Kamehameha Hwy, create the new parking lot and the Kamehameha Hwy can be shifted around it to allow pedestrians and tourists to reach the Beach on the Makai side along a pedestrian walkway without need to cross the highway. By increasing the distance between the parking lot and Laniākea Beach, this alternative will dissuade opportunistic tourists who do not wish to walk the 500 meters to the Beach. The increased distance will also lessen the stress on the sea turtles, monk seals, and other wildlife on Laniākea Beach as distance will limit the number of visitors to the Beach. This alternative will also improve erosion control of Kamehameha Hwy as the roadway will still be moved away from the shoreline, at an even greater distance than the preferred pedestrian shift. Include limited drop-loading area near Laniākea for disabled individuals, families with small children, locals with recreational equipment, and lifeguards, first responders, law enforcement.

Thank you for considering these alternatives that seek a more holistic and long-term solutions to the issues arising at Laniākea.

III. Section-by-Section Comments

3.0 Affected Environment, Potential Impacts, and Proposed Mitigation
(Grant Barring, Joel Burgess, Charlotte Frank, Mark Cave, Meyer Cummins)

3.1 Physical Geography and Coastal Processes

The DEA's description of the project area's geological features and kinds of soils present in the area should include an explanation of the significance of the geology and soil and how it relates to the proposed project and its effects in the long-term.

The Tsunami Hazards section is very detailed (describing the measurement process, history, and analysis of Tsunamis reaching the island), but this section does not seem to be as urgent or as important to the project and community as the shoreline erosion and climate change sections. Although tsunamis are less predictable than the other natural disasters or concerns listed in the section, it is unclear why disproportionate detail is included here given the low frequency of tsunamis and SEI & FEMA findings. We recommend that the detail here be reduced and adjusted in the various sections be kept proportionate to the significance and risks of and to the project.

3.1.1 Existing Condition

Geographic Setting

- How many visitors to the project area (on a weekly, monthly, or annual basis) are residents of the North Shore, O'ahu, or Hawai'i? This information should be differentiated and quantified through past or future surveys.
- How many visitors to the project area (on a weekly, monthly, or annual basis) are Native Hawaiians engaging in traditional and cultural practices (e.g., surfing, gathering limu or sea salt, fishing)?
- What will be the effect on residents and Native Hawaiian access to Laniākea Beach during the project's construction phase?

Coastal Erosion

- The DEA states that the long-term shoreline position of Laniākea Beach appears stable, yet "[i]f historic trends continue . . . Kamehameha Highway could be eroded away in the near future." Please provide more detailed information on this key issue, historic rates of erosion, differentiate the erosion rates of the various portions of the shoreline in this area, and define "near future" and the timeline.

- What are the dates for the "historical aerial photographs" used to analyze the position of the beach low water mark as part of the UHCGG 2010 shoreline erosion study?

Sea Level Rise

- The DEA does not identify the methodology of the historical extrapolation of the average Laniākea Beach shoreline recession due to increasing sea level rise statewide. The DEA states that, due to increasing sea level rise, "average shoreline recession (erosion) *in Hawaiʻi* is expected to be nearly twice the historical extrapolation by 2050, and nearly 2.5 times the historical extrapolation by 2100." What is the historical extrapolation of the average shoreline recession due to increasing sea level rise?
- How does this project fit into "big picture" efforts to mitigate the effects of sea level rise that threatens the stability/useability/structure of Kamehameha Highway along the North Shore of Oahu and the coastal highway system statewide? Please explain and include information on DOT's plan to address shoreline erosion for state highways along the coastline statewide and how the Laniākea project aligns, or does not align, with that statewide plan.
- Does the CRESI study provide details pertaining to the effect that certain types of adaptation measures, either typical or atypical, might have on Kamehameha Highway should they be adopted instead of simply monitoring the site as recommended?

Floodplains and Flood Hazards

- Given that the homes on the makai side of Kamehameha Highway in the project area are at high risks of flooding, what is the risk of flooding for the PSA?
- What were the historic incidents of flooding due to storm surge or rainfall, and not tsunami wave inundation, that have affected and may affect the project site?

Tsunami Evacuation Zones

Questions:

- How do climate change impacts affect the analysis of future tsunami evacuation zones in the project area?

<u>3.1.2 Potential Impacts</u>

NO BUILD ALTERNATIVE

Coastal Erosion

- After major storm events or flooding events how long does the highway typically stay closed?
- What have been the nature and costs of repairs?

Sea Level Rise

- "Not shown in the figure is that much of Kamehameha Highway within the project area would already be inundated by the 0.5 foot sea level rise" -- this indicates that the figures being used are out of date? Please use the most updated information.

PEDESTRIAN SHIFT ALTERNATIVE

- Are there examples of similar HDOT projects in size and scope?
- If so, what was the average difference between estimated and actual time to completion?
- What was the average difference between estimated and actual costs to complete?
- Does the estimated project costs take into account the rising fair market value of the real property acquisitions needed to complete this project should the project be delayed for any extended period of time?
- What, if any, are the mitigating measures to reduce the anticipated noise and light pollution/nuisance affecting the wildlife and nearby residences during the construction phase of this project?

Coastal Erosion

- How will the project mitigate potential coastal erosion problems caused by the removal or alternation of existing vegetation along the shoreline?
- The DEA does not provide sufficient detail on how this proposed project would protect the highway from the impacts of coastal erosion, which is likely to continue to push the shoreline inland in this area in the long-term.
- The DEA states: "As described in Section 2.4, the proposed highway consists of normal asphalt road structure with a buried concrete cut-off wall on the makai edge, which would protect the road from being undermined or washed out during severe flood events." Has DOT analyzed this kind of erosion mitigation (hard concrete buried wall) versus installation a permeable structure, a permeable highway surface, or a more climate-resilient surface treatment method other than traditional asphalt paving?

Sea Level Rise

- What analysis shows that moving the highway approximately 80 ft inland under the PSA would protect it from the impacts of sea level rise, estimated at 3.2-foot?
- Has DOT considered the scenario for faster and higher sea level rise given recent global climate "tipping point" events?
- Given that the PSA has an estimated 45 years of service – thus, until 2068, if completed in 2023 – how does the PSA align with a long-term solution after 2068 until the end of the century, given sea level rise and other geophysical factors?

Flood and Tsunami Hazards

- The DEA states that the PSA could "trap" a tsunami in a limited area. What are the implications of this "trap" on the nearby residential area or the coast?

<u>3.1.3 Avoidance, Minimization, and Mitigation Measures</u>

This section highlights the potential flooding hazards in the project area and aligns with 3.1.2 (potential impacts). The section concludes that there are no measures to avoid, minimize, or mitigate damage because inundation would not affect any structures. This section begins with an acknowledgment that the proposed road for the PSA would be in a flood zone, so the DEA should address avoidance, minimization, or mitigation measures for flooding, particularly given that that this is a key arterial highway for the North Shore.

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3.2 Land Use
(Hiʻilei Casco, Palakiko Chandler, Kendrick S. Chang)

<u>3.2.1 Existing Condition</u>

We encourage the DOT to consult with landowner Kamehameha Schools to ensure that future land uses in the surrounding area are aligned with the results of this proposed Project.

3.3 Historic and Archeological Resources
(Kenneth Go, Ying Gu, Debora Halbert)

A recent archeological survey identified two historic properties in the affected area. These include SIHP Site L-Bridge, a 1930s reinforced concrete bridge that meets the definition of a historic property, and SIHP Site T-1, which is a possible ceremonial site and includes Kahokuwelowelo and Iliikea heiau.

- Both sites have been identified as significant thus requiring a "significance assessment." (H.A.R. § 13-276-6).
    - Has the significance assessment been provided to SHPD as required in H.A.R. 13-276-6(D)? The status of the significance assessment is not clear in the DEA but the H.A.R. indicates that SHPD must concur before significance is finalized.
    - The language of Section 3.3 is not clear on whether both sites have been deemed significant.
    - Is a copy of the significance assessment available as an attachment? There does not appear to be one listed as an Appendix.
    - If the significance assessment cannot be provided, what specific research has or will be conducted for each of the "significance" criteria pursuant to H.A.R. 13-275-6?
    - The language of Section 3.3 references Section 3.4 regarding "other related sites" that may have significance. Have these other sites also undergone the relevant significance assessment? Given the importance of this area of evaluation additional specificity and clarification of the relationship among the sites may be useful.
    - Physical avoidance during construction does not necessarily mean no impact. Would realignment and new construction of the bridge cause potential geographical impacts to the existing bridge?

- H.A.R. § 13-276-6 requires that "Prior to submission of significance evaluations for properties other than architectural properties, the agency shall consult with ethnic organizations or members of the ethnic group for whom some of the historic properties may have significance under criterion "e" to seek their views on the significance evaluations. For native Hawaiian properties which may have significance under criterion "e" the Office of Hawaiian Affairs also shall be consulted." (HAR § 13-275-6(c)).
    - Has OHA been consulted regarding this site? In Section 3.4, the DEA indicates that OHA did not respond to an initial inquiry. Additionally, in the listing of Hawai'i Agencies, OHA was not listed as having provided any comments.
    - If OHA does not comment, what constitutes the required consultation?
    - Given that the site is on Kamehameha Schools property, what is its position on the project and alternatives (independent of the position of the lessees of the property)?

- According to Section 3.3.3, ownership and control of Site T-1 will not be acquired by the HDOT. The DEA states that Site T-1 is on Kamehameha Schools property and the only concerns are during construction. After construction, the "treatment of Site T-1 is ultimately their kuleana." (P. 3-16).

- ○ How were the findings regarding construction activities and potential effects communicated to Kamehameha Schools?
- ○ Did Kamehameha Schools acknowledge receipt of the findings or provide any comments?
- ○ How will DOT take responsibility for monitoring and mitigating the long-term effects of this project on sites like T-1?
- ○ In their letter responding to the DEA (PDF, p. 161), Kamehameha Schools suggests that both the Waialua Hawaiian Civic Club and Waialua area cultural descendants be consulted. Section 3.4 indicates that the Waialua Hawaiian Civic Club was notified (but did not respond). Please clarify whether the individuals listed are Waialua area cultural descendants as described by Kamehameha Schools and the efforts to consult them.
- ○ Because Site T-1 is interpreted to be a "possible" ceremonial site, how would the effects analysis and mitigation measures differ if the site was confirmed to be a ceremonial site?
- ○ More details should be provided on the lease conditions for lessees on Kamehameha Schools lands that may be affected by the project.

- The description of the ceremonial site is that it is partially within the current study but that it "falls outside the proposed development footprint (p. 3-16)." The report indicates that "once roadway construction is complete the realigned Kamehameha Highway will be no closer to Site T-1 than it is currently" (p. 3-17).

    - ○ How far away is the site from the project?
    - ○ What is the potential impact on the site itself during construction?
    - ○ How will roadway construction impact those who may be currently accessing the site?
    - ○ The description indicates that the Kahokuwelowelo and Iliikea heiau are in the relevant area: approximately how far away from the project site are they located? Are they included in the significance assessment (see questions above related to significance)?

- Section 3.3.4 states that an archeological monitoring plan will be developed prior to "initiating and ground-breaking activities" as required by H.A.R. § 13-279-4.

    - ○ What is the timeline for development of the archeological monitoring plan in the context of the project?
    - ○ H.A.R. § 17-279-4 requires a written plan – when and how will DOT develop this plan?
    - ○ If iwi kupuna are discovered, work would be halted; what is the nearest site in which iwi kupuna have been discovered in the past?

- Both sites required H.R.S. § 6E-8 review, the review process link (PDF, p. 108, Section 4.2.1)
  State Historic Preservation | HRS 6E-8 & 6E-42 Review Process (hawaii.gov)

  - It seems that only the first three steps were completed? Please clarify.
    - Step 4 mitigation comments (H.A.R. § 275/284-8(a)): If a project will have an effect on significant historic properties then mitigation commitments must be proposed/agreed to. Mitigation shall be specific to each property affected. Has Step 4 been completed?
    - Step 5 development of mitigation plans (H.A.R. § 275/284-8(h)): After mitigation commitments are accepted, the agency shall develop detailed mitigation plans and provide them to the SHPD. Has Step 5 been completed?

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3.4 Cultural Resources
(Joho Horton, Cale Honda, Jennifer Hee, Pa Ly, Tisha McKinney, Jake Ruby)

Cultural Impact Surveys

- Limited number of respondents: ASM Affiliates (ASM), the HDOT contractor responsible for conducting the CIA, identified thirteen individuals and organizations it believed possessed the knowledge required to identify the proposed cultural impacts of the project. This number or respondents appears low given the total population of the area in question. Laniākea Beach lies within the 2.3 square mile moku of Waialua that as of 2020 has a population of about 4,000 people. Only four individuals agreed to answer ASM's interview requests.

- What follow-up efforts were made, or are being made, to secure additional interviews of individuals with cultural knowledge?
- Does DOT consider four respondents sufficient?
- Due to the extenuating circumstances of COVID, the DOT should make extra effort to solicit the opinions of the 9 nonresponsive ASM Affiliates-identified individuals and organizations again to provide a more comprehensive understanding of the area.
- In its public comments, Kamehameha Schools recommends talking with Waialua-area cultural descendants and the Waialua Hawaiian Civic Club to get a local perspective on the cultural importance of the area. Did ASM conduct this outreach effort?
- How completely did ASM follow OEQC Guidelines for Assessing Cultural Impacts?

- ○ COVID-19 Pandemic limited collection methodology: Citing the OEQC Guidelines for Assessing Cultural Impacts-Section III, ASM identified the constraints and limitations which affected the quality of information it obtained. COVID-19 and the consequential "Stay-at-Home" orders issued during ASM's survey limited their ability to meet with people with cultural or historical knowledge of the area. Did ASM consider other methods for interviews such as phone, zoom, mail, e-mail, or video-recorded testimonials?

3.4.1. Existing Condition

○ Kawailoa Plain contains "a good amount of archaeological and cultural studies with findings spanning from pre-contact to early and late Historic eras," with the inclusion of three heiau located just north of the project area. Multiple residents expressed concern that one of these heiau is considered to be within a cultural landscape that extends into the project area, and that construction or the resulting raised tourism levels could be of detriment to these sites. These concerns warrant further interviews to determine effects and significance.

○ Jaucas sand, an indicator of burial sites in past instances, has been identified directly within the project area. Additional interviews should be conducted to further document the potential for impacts given this condition.

○ The DEA indicates that "background research and consultation process did not identify any ongoing traditional cultural practices within the current project area [but] several such practices do occur in the vicinity of the project area, including surfing, limu picking, subsistence fishing (including with a pole and throw net) and diving." Collection and analysis of more interviews on these issues with practitioners should be conducted to identify potential indirect and secondary effects of the project.

- Kahokuwelowelo Heiau

  - ○ "Kahokuwelowelo Heiau is situated outside of the project area but is considered to be part of a larger cultural landscape that extends through the current project area to the shore." The exact location of the Kahokuwelowelo Heiau and its perimeter to the project area are not clearly stated or mapped out, thus making it difficult to assess potential impacts. Although there may be legitimate reasons for not disclosing the exact site of Kahokuwelowelo Heiau, how does DOT install a sufficient protective perimeter to mitigate potential impacts during and after construction?

  - ○ How will DOT coordinate with the landowner and "interested community members and organizations such as I Nui Ke Aho, a non-profit organization who

> cares for and conducts ceremonies at Kahokuwelowelo and other sites in Waialua" to ensure no impacts to these cultural sites?

Kamehameha Schools Land Acquisition

Details regarding the potential purchase of land from Kamehameha Schools (timeline, cost, obstacles) should be disclosed because the preferred alternative depends on the usage of Kamehameha Schools' property. Because the current lessee has objected to use of the leased land for the highway realignment in the past, how can DOT ensure the cooperation of Kamehameha Schools in the required land acquisition for the project?

3.4.2. Potential Impacts

The DEA does not mention how their proposed project will impact Native Hawaiian custom and practice.

The sea turtles that rest at Laniākea Beach have served as aumākua, or deified family guardians, of Kanaka Maoli for centuries. The fourth verse of the Kumulipo, the Hawaiian creation chant, mentions the honu (green turtle) and honu'ea (hawksbill turtle). The DEA does not the effect or effects the proposed project would have on this Hawaiian tradition and custom. The DEA does not identify any Hawaiian families or individuals who may have practices related to these aumākua and how such practices may be affected by the construction or operation of this project.

The preferred alternative would increase the number of cars that could park in the vicinity of the Laniākea Beach from 50 to 90, almost double. It would provide an area for tour buses. Thus the proposed project will likely substantially increase the number of people who could disturb, harass, molest, and annoy the sea turtles, as well as practitioners of hō'aumakua. As such, HDOT needs to conduct a more in-depth Cultural Impact Assessment (CIA) to account for the cultural obstruction the proposed project will create. An Environmental Impact Statement (EIS) can accomplish this.

Construction Impacts on Recreational and Cultural Practices

If construction limits or prevents access to Laniākea for an indefinite amount of time, this is a significant effect under § 11-200-12, HAR, as it curtails the range of beneficial uses of the environment.

What is the DOT's plan for an alternative parking arrangement to ensure coastline access for recreational and cultural access during construction?

During construction, how does the plan to eliminate the parking across from Laniākea on the Laniākea Support Park parcels comport with H.R.S. Chapter 205A?

What will be the spillover impact on the surrounding neighborhoods during the construction shut-down period?

How will the shut-down period affect access for people with disabilities and families with small children?

Will Laniākea Beach Support Park be maintained for recreational activities during and after construction?

During construction, how will DOT mitigate the spillover effect of people parking on the shoulder of the highway and crossing the highway?

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3.5 Biological Resources
(Noah Hoshino, Kolby Kahahawai, Johnathen Kawakami, Loredana Craciun, Josiah K. Sewell)

3.5.1 Existing Condition

Section 3.5.1 provides an overview of the biological resources in the project location. The area was surveyed on three occasions (October 2019, August 2020, and March 2021). Three study dates, conducted across three calendar years is insufficient to fully catalog the resident species of the area.

Appendix E correctly states that the project area is relatively dry, with 36 inches of annual rainfall, and the peak rain fall occurring in January. Anecdotally, these seasonal weather patterns result in drastic alterations of the physical environment at Laniākea, including the addition/subtraction of sand from the beach and the creation of temporary streams and waterways in the wetter months. The study conducted surveys in March, August, and October, all of which are comparable in rainfall and on the lower end of the annual precipitation spectrum. Without additional survey dates during the rainy season (December to February), how can the DEA be certain of the presence/absence of additional species, including endangered ones?

How can limited surveys conclude the absence of waterbirds in the project area ("no waterbirds were observed utilizing the Lauhulu Stream area") when no surveying was conducted in the rainy season, the wettest portion of the year in the project area?

All of the survey dates were conducted during daylight hours, yet the DEA makes conclusions regarding the absence of endangered, nocturnal species such as the Hawaiian hoary bat and Hawaiian short-eared owl ("*Pueo*"). How can the wildlife survey be relied upon without nocturnal sampling?

3.5.2 Potential Impacts & Appendix E:

Appendix E provides a few recommendations to mitigate the impact on protected resources including Pueo and the Hawaiian hoary bat. The DEA only briefly mentions that Honu, or Green Sea Turtles, were spotted in the water during the survey. As a protective measure, the DEA suggests that construction activities "be monitored to ensure that neither of these two marine species (Honu and Monk Seals) are disturbed."

The assessment inexplicably minimizes the significant and well-known presence of Honu on the shores of Laniākea. The description gives the impression that the Honu are only occasionally spotted in the waters surrounding Laniākea beach. However, the beach is known for the large number of Honu that come ashore daily. The unusual basking behavior of Honu on this beach, their feeding activity in the nearshore area, and their high numbers in the area are, in fact, the reason for the increasingly high levels of tourism and the "pedestrian" problem that is the current justification for the project.

It is surprising and puzzling that Honu were not fully surveyed or considered in the DEA. A thorough marine resources survey should have been conducted for the DEA. Without such a survey, the potential impacts cannot be properly assessed and the mitigation measures will likely be inadequate.

The recommendations provided in Appendix E are cursory and insufficient for species that are protected under federal and state endangered species laws. The recommendations leave open for interpretation the level of protection to be afforded during the project, which is problematic. The general recommendation of "monitoring" the turtle species during construction offers little information on specific monitoring activities, who is responsible for monitoring, or how potential interference with such species will be mitigated. Additional details should be provided.

Additionally, the DEA does not discuss the secondary impacts of the project. By creating more parking and increasing access to Laniākea beach, the project will enable more growth in the number of visitors. The effects of such growth on biological resources in the area were not considered or discussed in the DEA. Section 3.5 even acknowledges that "the cove has become known as 'Turtle Beach' and is a popular destination for tourists to observe the species closely." However, Appendix E does not point out the impact of the project on the number of visitors or crowding of the marine resources, in particular Honu and Monk Seals. There have been many reports of Monk Seal and Honu harassment as a result of the large tourist crowds at Laniākea. The State Department of Land & Natural Resources Division of Conservation and Resources Enforcement recently assigned officers to patrol Laniākea in order to prevent a spike in tourist harassment. Increasing the amount of parking, without mitigating measures, will likely lead to increased negative impcats on protected species and should have been fully analyzed in this section of the DEA.

Another secondary impact not considered is the increase in irresponsible fishing that could occur as a result of increased parking with the project. This could have negative impacts on the Honu due to accidentally hooking or entanglement in line. These potential impacts should have been thoroughly considered in the DEA and recommendations should have been provided to mitigate these concerns.

The Methods of Study for the survey of the terrestrial, vegetation and wildlife survey indicates that the study was conducted by LeGrande Biological Survey Inc. flora and fauna. Did the consultant reached to state and federal agencies, and community members, who have substantial expertise in these marine protected species issues, in this location, for data, analysis, and mitigation recommendations?

Proposed Mitigation of Impacts on Endangered Species

- Appendix E proposes a pre-construction nest survey to verify the presence/absence of *pueo*, which we commend. However, in the event *pueo* are discovered in the project area, the proposed mitigation is to cordon off the nest and establish a "50-foot buffer" to avoid construction disturbances. Is this sufficient protection for a nesting endangered species? How was this figure obtained? What is the basis for this proposal as sufficient mitigation?

- The DEA acknowledges the presence of both Green and Hawksbill Turtles, species known to be affected by artificial light. The proposed street lights implemented in the Pedestrian Shift Alternative will be spaced every 120 feet and equipped with flat lens fixtures to reduce glare and shield light, but can this be certain to have no significant impact on the turtles, as well as migrating birds, without further study and analysis?

- We agree with the importance of declaring artificial lighting as an issue for sea turtles. However, we would like this point to be more developed. The draft environmental assessment should explain the negative impact artificial lighting has on turtles and stress the fact that it should be avoided by the project. If the lighting is critical for the project, this should be explained. The draft should include with this sentence that the lighting can cause problems for resting turtles, foraging turtles, and nesting sea turtles and their hatchlings (even if Laniākea may not be a known nesting area at this time, recent nesting activity has increased in "new areas" along the North Shore during the COVID shutdown).

- The proposed mitigation during the construction phase for pupping Hawaiian hoary bats is a blanket restriction on cutting down any trees less than 4.6 meters in height. No nocturnal surveys have been done to confirm the presence/absence of bats in the project area. Since the bats "use multiple roosts in their home territories," how was this threshold tree height determined? How can the DEA conclude this arbitrary height will result in no significant impact on the hoary bats, if present (which is unknown due to insufficient nocturnal surveying), particularly when Appendix E acknowledges the significant threat deforestation poses to adult females and pups, which may be unable to flee a tree being felled? Given the bats' endangered status, this would suggest a finding of significant impact, at least until further surveys can more conclusively determine the true probability of bats nesting in the area and the basis for the tree-height threshold and its efficacy in protecting bats during construction.

3.6 Surface Water Resources
(Gillian Kim, Shari Matsudo, Sarah Anne Mau)

- Section 3.6.1
  - The DEA does not adequately describe the USFWS designated wetland area. The DEA states, "The stream channel itself is intermittent and appears to have water flow only during heavy rain events. Additionally, an area to the west of the stream is mapped as an estuarine and marine wetland by the NWI, but no evidence of standing water was observed to the west of the intermittent stream during site surveys in March 2021 (Appendix E and Section 4.2.2). No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during site surveys and no wetland soils were present."
  - Appendix E on the Wildlife and Terrestrial Vegetation Survey did not clearly include specific times of day that the survey was conducted to compile list of impacted wildlife and terrestrial vegetation (e.g., "No wetland plant species (Obligate Wetland Species or Facultative Wetland Species) were observed during site surveys and no wetland soils were present.") The areas that constituted the wetland that was mentioned were unclear and confusing, both from the textual description and the accompanying images, and are need further clarification.

- Section 3.6.2
  - Under the Pedestrian Shift Alternative, the new bridge would create more stormwater from the impervious road surface than the existing bridge. The DEA appears to discount the effect by asserting "[T]he amount of existing impervious surface would be lower when one lane of the current Kamehameha Highway is removed."

        - Was there an evaluation of stormwater runoff generated from the existing bridge and how the amount of stormwater runoff from the new bridge may differ?
        - More information is needed to understand the impact created in higher generation of stormwater runoff from the proposed new bridge from the existing bridge.
    - A visual representation of the new bridge and details should be included in this section, as the text used make it hard to understand exactly how the new bridge will differ from the old bridge in terms of size, location, and direction.
      .
- Section 3.6.3
    - "The design for the bridge would not require any permanent structural components be placed in the stream." This statement is hard to evaluate with at least conceptual design information about the new bridge. This information should have been included in the DEA.
    - Regarding the vegetative swale ("The project will also implement the permanent Best Management Practice (BMP) of vegetated swales across the mauka side of the existing road to carry stormwater and to allow infiltration…"), DOT should specify utilizing native plant species for habitat restoration.

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3.7 Parks and Recreational Resources
(Evan Miyaki, Micah Miyasato, Elizabeth Songvilay, Abe Yi)

3.7.1 Existing Conditions

Laniākea Beach attracts the very visitors - "locals and tourists alike" - whom DOT seeks to protect with its proposal to improve pedestrian safety. It is, therefore, vital to balance the management of visitors and potential impacts on the surrounding environment. Residents and tourists frequent the area to access popular surf spots and to watch Honu rest, feed, and swim at Laniākea Beach. The accessibility to the high numbers of Honu on the shoreline attracts large numbers of tourists and that attraction for tourists plays a key role in the "people management" issues that lead to traffic congestion and pedestrian safety concerns.

The City and County of Honolulu Department of Parks & Recreation owns key parcels of land in the project area. The DEA recognizes two beach park lots the City & County of Honolulu's Department of Parks and Recreation (DPR) own that may be developed in the future. However, there does not appear to have been an effort to coordinate with DPR regarding the project or alternatives.

The State Department of Land and Natural Resources has responsibility for the shoreline and conservation resources, as well as the wildlife, in conjunction with NOAA and USFWS. Given the especially sensitive project setting including protected natural resources and wildlife, the expertise of the Department of Land and Natural Resources (DLNR) and the federal agencies (NOAA, USFWS) should have been tapped and fully integrated into the DEA. The DEA does not indicate, however, efforts to come up with a coordinated multi-agency solution to the driving factor that is causing the congestion and pedestrian safety concerns: the unfettered access of tourists to the beach and lack of crowd control or enforcement.

HDOT predicates this project on Hawaii's heavy reliance on tourism without considering the potentially destructive consequences of increasing accessibility to Laniākea. Without critical engagement of all of the agencies with co-management responsibilities for the area, the HDOT appears to have taken an overly narrow look at the issue of safety without considering the overall "integrated planning" elements of the root problem and a coordinated solution.

Given the goal of Chapter 343 to integrate planning efforts and agency coordination, please describe HDOT's efforts to engage City, State, and Federal agencies in an integrated planning process and a multi-agency alternative that would take a holistic look at the natural resources implications of the realignment.

The DEA does not mention the lack of restroom or shower facilities at Laniākea. With the increase in parking and visitors projected under the Pedestrian Shift Alternative, how will the thousands of visitors/users be accommodated in terms of restroom facilities? What are the implications of continued use of "bushes" as restrooms for thousands of people a day visiting the area? This section and the Water Quality section should address the implications of this continued and induced growth in vistors to the beach.

3.7.2 Potential impacts

The proposed alternatives that invite more tourists -- some of whom show a propensity to disregard state and federal mandates -- increases the likelihood of incidents involving harassment of Hawaii's endangered species.

Discouraging visitor access to Laniākea can serve both concerns of safety and protection of wildlife. Imposing parking fees, limiting parking stalls, and stationing personnel to enforce parking restrictions -- in addition to the guard rails and crosswalk -- can deter people from crowding the area. Communication of limited parking near the beach can also alert drivers of the small likelihood of finding parking. Fewer numbers of people not only decreases the chance of wildlife harassment, it also makes it easier for park officials and watchful beach-goers to spot and chastise those who still attempt to touch the Honu or Monk Seals.

Pedestrian Shift Alternative

The Pedestrian Shift Alternative (PSA) creates more parking for those accessing Laniākea Beach for recreational use (60 to 90 stalls). Recreational activities at Laniākea need to be surveyed and and analyzed before any project looking to accommodate an increase of human presence moves forward. The DEA does not consider the environmental impact of continued or increased recreational use of Laniākea without new mitigating procedures.

The PSA creates the greatest potential for increased human activity at Laniākea. The shift moves parking from the mauka side of the highway to the makai side of the highway. The accessibility to Laniākea would likely increase tourist and recreational use of the beach. The PSA's effect on human activity extends beyond the more immediate accessibility of parking closer to the beach. The PSA "was designed recognizing . . . potential future park use." A "formal parking area" or added "beach amenities" – without new restrictions - would bring more people in contact with marine wildlife, which is a significant impact meriting consideration in an EIS.

During the construction phase of the Pedestrian shift alternative, access to Laniākea Beach will be "more difficult" due to guardrail barriers being installed. The DEA acknowledges that access to the beach area will be temporarily "more difficult" and that this may "last for up to 24 months." The DEA reveals very little about the nature of the restrictions. This leads to the following questions:

- Can DOT elaborate on how difficult is "more difficult?" Will there be functionally no access to the beach area?

- In what ways could temporarily restricted access to the beach area affect different categories of recreational access from surfers, tourists wanting to view sea turtles, and local residents wanting to enjoy a nice day at the beach?

- What would the construction entail? Could construction affect or impede beach users enjoyment of the beach area even if they are able to access the area itself? Would there be significant noise, dust, and lighting issues that are common in construction areas? While it is noted that the wildlife in the area is accustomed to people, how will construction impact the wildlife, including the sea turtles, which are the area's main attraction for tourists and residents?

- During the 24 month construction period, how will traffic be impacted in the construction corridor? How would parking be impacted?

- What effects will construction have on commute times for residents and tourists in either accessing the beach area or using that stretch of Kamehameha Highway to move to other parts of the island for work, school, and recreational activities?

- How will construction impact pedestrian safety in the area?

- What agency would be in charge of regulating beach access both during and after construction? DLNR or the City? If so, has DOT consulted with them on a plan of action?

- Once the parking lot is constructed, what agency is responsible for maintaining the parking lot itself and establishing safety and security in the area?

3.7.3 Avoidance, Minimization, and Mitigation Measures

Pedestrian Shift Alternative

By supporting "ready access to Laniākea," the HDOT is not considering the impact increased access could have on Honu and other marine life.

The DEA acknowledges that traffic and parking will be "temporarily limited for up to 24 months."

- How will traffic congestion, in an already very congested corridor, be impacted and what mitigation measures will be put in place to address that?

- Will any measures be taken to address impacts to parking?

- Does DOT plan to implement mitigation measures to minimize impacts to parking and access to the beach, if any?

- During the construction phase, presumably residents and tourists would still cross the road to access the beach. What measures will DOT take to mitigate any additional pedestrian safety risks?

- What measures would DOT take to mitigate noise and dust from a construction area that could disturb residents living in the area and interfere with visitors' enjoyment of the beach area?

- After the proposed project is complete, while public safety may improve, what measures will be taken to manage the additional traffic of people and the impact that will likely have on the land and marine wildlife in the area?

- Will DOT be coordinating with DLNR and DPR in the maintenance and management of beach resource access? If so, what plans are being considered?

3.8 Visual and Aesthetic Resources
(Naima Te Maile, Farah Danial Mok, Christopher Pang)

3.8.1 Regulatory Requirements

Lanikea is one of the most scenic coastal views from the highway along the North Shore. The DEA does not explain why only a brief visual impact assessment ("VIA") was conducted. Per the FHWA's Guidelines for the Visual Impact of Highway Projects this less detailed level of VIA is appropriate for assessing routine or minor projects. Please explain why the Project should be considered routine or minor.

The DEA also does not mention that a brief VIA was chosen in part, according to Appendix H, because "based on public engagement activities to date, there has been a low level of local concern regarding the project's visual components." However, it appears that not very many community members were consulted for the DEA, and Appendix H does not mention what concerns they had about the visual components of the Project. As such, the VIA might not accurately reflect community sentiment as opposed to assumptions by landscape architects and planners assume people would want.

Given the scenic beauty of this particular area, the potential significant impacts of realignment and a new makai parking lot, and the obligations of all state agencies under Article XI, Section I of the Hawaii'i Constitution to protect "natural beauty" ("Conservation and Development of Resources. For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty . . ."), the DEA should have conducted a more complete and detailed VIA.

3.8.3 Potential Impacts

Maintaining Rather than Improving the Aesthetic and Visual Impacts of the Project

The main text of the DEA and Appendix H reflect a very conservative approach to the aesthetics of the Project. Of course, the VIA properly uses the existing appearance of the site as the baseline for determining the aesthetic and visual impacts of the Project. Yet, the finding that the Project alternatives generally have little impact on the visual character and quality of the area shows that the Project is not designed to improve the appearance of the area. Planners instead focused on maintaining its existing appearance. This is a lost opportunity to enhance the visual quality of the Project and the natural environmentt of a highly scenic and sensitive area.

Maintaining the Scenic View Conflicts with Traffic Management and Safety

The DEA notes that for both the TSM and the Pedestrian Shift Alternatives the scenic views "would still tempt drivers to slow down to enjoy the stunning sight of Laniākea Beach." Drivers slowing down either to see Laniākea Beach from their cars or to park their cars to get out and view the beach are a main source of traffic problems in the area. Although both of these alternatives reduce the number of pedestrians crossing the road, they do little to solve the problem of slow, distracted driving in the area. Routing the highway farther inland would solve this problem and the interaction with the view by drivers passing at a higher elevation, or a potential pullover for the viewplane, should have been analyzed.

Revegetation and replanting

In respect of the Pedestrian Shift Alternative, the DEA mentions at 3.8.3 revegetation and replanting efforts on both sides of the proposed roadway. No specifics are given regarding this portion of the project. No details are provided regarding the density, distribution and species composition of current vegetation and proposed revegetation.

1. Please give further details regarding the density, distribution and species composition of the proposed revegetation and replanting.
2. Who will be responsible for the revegetation and replanting?
3. What is the timeline for revegetation and replanting? How long will the revegetation and replanting process take? This timeline should be considered in the visual analysis.
4. Will such revegetation and replanting projects be protected from human traffic
5. Will native species be used? Please note that native species may be required by State Highway landscaping laws and, if so, this should be noted and explained.

Such information is required especially since at 3.8.3 it is mentioned that the proposed Highway will displace some of the vegetation, but this is not taken into account in the visual analysis given the assumption that the revegetation will replace such displacement. This information would be helpful as well to further supplement the claims that it would benefit erosion control and coastal ecosystems (see as well 3.18.1, 5.0 paragraph 10) and the overall visual impact (see Appendix H at 4.5.4).

Pedestrian Traffic Impacts to Visual Quality

The main text of the DEA and Appendix H fails to address the impact of pedestrian traffic on visual quality for travelers and neighbors alike. As stated at 1.5.1, "200 to 300 pedestrians cross the [Kamehameha] Highway each hour from about 11:00am to 4:00pm to get to the beach from their vehicles." Thus, the population density at the site is *substantial*, and any alternative proposing to increase accessibility for pedestrians and motorists will likely obstruct and compromise the view even more significantly.

The proposed Pedestrian Shift Alternative may create significant adverse impacts on visual quality by adversely affecting the sensitivity of neighbors and travelers. In Appendix H at

4.5.2, it is stated that "the size and scale of widened road, refuge median, guardrails, and other ancillary elements may impose slight adverse effects to motorists and a small number of commercial neighbors; however, the human and project environments will be orderly and coherent for neighbors and travelers." This conclusion is not supported by any explanation as to how "coherence and order" would be achieved.

Furthermore, the fact that the new roadway and auxiliary features are "common" does not necessarily mean that a significant increase in size and scale would not negatively impact visual perception in this special area. The DEA should acknolwedge that despite the desirability from an engineering perspective of "project orderliness and coherence," a large new makai parking lot with 90+ cars constantly moving in and out, plus thousands of daily visitors on the beach, may detract from the beauty of this naturally scenic area.

Construction Impacts to Visual Quality

In Appendix H at 4.5.3, it is clearly stated that if the Pedestrian Shift Alternative is adopted, that there will be a negative visual impact as a result of the construction of the highway for 18 months, that "during the construction of this alternative, both neighbors and travelers could perceive that the visual quality of this project's Area of Visual Effect (AVE) would be temporarily degraded." However, these construction impacts are not mentioned in the visual analysis portion (at 3.8) of the main DEA document.

Other than shielding of lights, there are no other construction-related mitigation measures with regard to the impacts to visual quality of the area (see Appendix H at 4.5.3).

Cultural Site

The DEA and Appendix H gloss over the visual impact of increased highway lighting on Kahokuwelowelo Heiau, which is used at night to perpetuate traditional the Native Hawaiian knowledge and practice of wayfinding and star navigation. Appendix H notes that the number of viewers at the cultural site would be small and that new lights could be shielded to reduce glare at night. This approach seems to minimize the cultural signifance of the practice and the need to avoid, not just mitigate, impacts.

3.8.4 Avoidance, Minimization, and Mitigation Measures

Pedestrian Shift Alternative

Appendix H states that a possible avoidance measure is adjustment to the proposed roadway alignment to avoid large trees, native plantings, or visually pleasing features; particularly adjacent to the Lauhulu Stream riparian corridor. There is no indication that the inventory for the VIA actually identified and located these aesthetic features that would possibly be impacted. Please provide the details for this analysis and conclusion.

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Section: 3.9 Roadways and Traffic & App. B – Traffic & Pedestrian Circulation
(Claire Rossi de Leon, Diego Rivera, Kealapono Richardson)

Existing Conditions

The data used for this study were not comprehensive enough to provide significant conclusions as the data were only collected on two days. Although the DEA does attempt to show a difference between a Thursday and a Saturday, this is not enough to really show any patterns. Data should be collected on all seven days during a week to give a full picture, for at least two weeks separated by a period of at least a month. At minimum, counts on Thursday and Saturday should be repeated on another week so that the DEA can provide an understanding of the conditions, particularly given that traffic and congestion are critical issues for the project.

The tables in this section are not easily understandable to the general public; acronyms like EB and WB should be spelled out. Table 2 describes parking related turns in the area, but it is not clear what exactly it is describing, as terms like "in" and "out" are used but not properly defined. Is this describing cars moving in from the road or the parking lot? A diagram would be helpful to accompany these charts. The data located in Appendix B are difficult to follow; adding table descriptions to the data tables to describe each column and row will make the data more digestible. Additionally, each table is referenced in the writing portion of the Appendix, therefore it might be helpful to give a detailed description of the variables and how they interact with each other instead of a cursory description of the data.

This section states "2012 HDOT traffic counts at Chun's Reef (roughly 0.4mile northeast of the Laniākea Beach) were used to establish a baseline for Kamehameha Highway through traffic." Why is 2012 considered to the baseline for Kamehameha Highway through traffic in 2021? The concrete barriers were installed in 2013. This section should include a description of the historical context – when did the visitor at Laniākea increase, presented alongside annual traffic counts.

After the tables, this section goes on to describe how "the hourly pedestrian crossing peaks were 242 pedestrian crossings per hour during the weekday afternoon (between 2:00 PM and 3:00 PM) and 338 crossings per hour during the Saturday afternoon (between 11:45 AM and 12:45 PM)." This data does not match Table 3, so it is not clear to the reader where these new data are coming from. Were these data collected in a different year so intended to be a comparison, or were these collected on January 16 and January 18, 2020 as well?

"A travel time that would normally be 10 minutes with no Laniākea Beach slowdown would take 11-12 minutes due to about 1-2 minutes of additional delay caused by the beach." The observations of the class include many stories of being stuck in this traffic jam for at least 10 minutes, thus it is hard to understand this claim that the slowdown only causes 1-2 minutes of delay. Later on in this section, the actual data show delays ranging from 4-24 minutes. The sentence quoted above is misleading and should be edited for clarity.

Existing Conditions Analysis Methodology

Please describe what Synchro and Simtraffic are. The general public does not understand what these words mean and how these applications were used to calibrate the data.

Year 2030 Conditions

Year 2030, the project's proposed build year, the plan does not take into full account the rapid acceleration in climat conditions. The DEA should utilize updated current information on 2030 conditions including how the City & County of Honolulu's new plans from the Office of Climate Sustainability and Resiliency can inform project design, potential impacts, and mitigation, and the DOT's recently released Climate Action Plan - https://hidot.hawaii.gov/wp-content/uploads/2021/07/HDOT-Climate-Resilience-Action-Plan-and-Appendices-May-2021.pdf

Year 2030 Conditions Analysis Methodology

Data used to analyze four alternatives are based on 2012 collection and depict a narrow data set. See comments under "Existing Conditions" regarding 2012 data. Is this method of data and prediction the best method for future conditions?

1. What other factors are important to analyze related to road condition? Number and frequency of traffic accidents, pedestrian accidents, or close calls?

2. Number and frequency of tour buses that contribute to traffic?

3. Number and frequency of local vs non-local traffic?

Year 2050 Conditions

Is a steady 1.0% growth rate over the course of decades an appropriate measure to use for the potential conditions at this specific scenic and heavily touristed area? Since the state reopened to tourism, despite the continued worsening of the pandemic, especially in Hawai‘i, the numbers of tourists have skyrocketed past pre-COVID levels. Additionally, as developments and hotels continue to expand, it seems that a flat 1.0% growth rate is hopeful; with all these additions it would seem likely that growth rates of traffic will grow exponentially, or might not hold steady at 1.0%.

Additionally, while no new developments are planned in the immediate vicinity of Laniākea, the issue is developments all around the island because this is a tourist attraction; if there is development growth and continued tourism growth elsewhere on the island, there will continue to be traffic and congestion issues even if no new houses or hotels are built between 2030-2050 in the surrounding area.

3.9.1 - Existing Conditions

See "As described in the Traffic and Pedestrian Circulation Study (Appendix B), pedestrian and vehicle data were collected **several times over multiple years** to analyze the impacts of both the previous barrier and to evaluate the proposed project." Please make the **bolded text** specific. Also add a general explanation on how data were estimated using predictions made from historical data and the 2035 Oahu Metropolitan Planning Organization (OMPO) model. Is this the best method and appropriate framework for analyzing future trends and conditions taking into account climate change factors in Hawaiʻi?

Although useful to compare how conditions were affected by the inclusion of the barrier, it is also necessary to evaluate the situation from a larger perspective. How will climate change affect these areas? Will a road through this area be feasible if sea level rises to estimated heights? If not, how can we begin to redivert road traffic today as if the sea level was rising tomorrow?

Section 3.10 Pedestrian Safety
(Siena Schaar, Kanani Smull, and Malia Staab)

3.10.1

Generally, Section 3.10.1 fails to present data that illustrate past and existing conditions concerning pedestrian-motorist related accidents and/or fatalities in the project area and along the North Shore stretch of Kamehameha Highway.

The section lacks concrete, multi-year data concerning incidences of motorists striking pedestrians both in the project area and along the North Shore stretch of Kamehameha Highway. This data is important because it can be used to assess the purported need for "pedestrian safety" versus other needs that are perhaps more critical to the community, such as environmental and cultural resources of the area.

This section briefly mentions the March 2021 technical report titled: "Traffic and Pedestrian Circulation Study,"[1] which was conducted by consultants WSP Hawaiʻi Inc. The report (*see* Appendix B) presents general pedestrian and vehicle data collected over a few years, to assess the impacts of traffic congestion and travel time across the various proposed alternatives. Yet, the study does not directly assess pedestrian safety. For example, no data were collected concerning the number of "close calls" between pedestrians and motorists that may indicate the need for increased pedestrian safety, nor does it provide an estimation of the distribution of specific user groups who are causing the purported safety concerns in the project area (i.e., tourists, locals, etc.). In doing so, the "supporting" study is misaligned with the main asserted purpose of the project - pedestrian safety - which remains weakly supported by a single, tragic event of a motorist striking a pedestrian in the project area in August 2019.

The DEA should provide more detailed data to substantiate the main purpose of the proposed project and preferred alternative. This should also include data and discussion regarding pedestrian-motorist accidents and fatalities on Oʻahu, the North Shore area specifically, and nearby stretches of Kamehameha Highway - to present a more complete picture of the scope of the issue and to better articulate the need as being one supported by data.

Furthermore, additional data should be collected, presented, and analyzed to determine which user group(s) are historically and presently contributing the most to pedestrian-motorist conflicts. This nuanced analysis may change the consideration of the alternatives. Moreover, mitigation measures based on this user data should be incorporated into the analysis of <u>all</u> proposed alternatives

The DEA does provide general estimations of the amount of pedestrian foot traffic in the project area, for example, describing how "as many as 338 pedestrians cross[] the road [in the project area] during a single hour on [any given] Saturday afternoon."[2] However, the DEA lacks any specific data or estimation regarding the make-up and distribution of user groups who (1) illegally park in the mauka parking lot; and (2) illegally cross the Highway during "peak" periods (posing the main pedestrian-motorist risk). This specific data is critical to understanding, and thus constructing mitigation measures, that provide for pedestrian safety in the project area.

For example, if the majority of illegal crossings in a "peak" period are by tourists illegally parking and/or stepping out of tourist's busses/shuttles - then specific mitigation measures should be formulated to target the safety concerns that those user groups pose. Like all management strategies - the solutions, and their supporting data, should be both place-based and stakeholder/user-group informed.

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[1] DEA at *Appendix B*.
[2] DEA at 3-35 (citing the Traffic and Pedestrian Circulation Study in *Appendix B).*

Here, if after further study it is determined that tourists are presenting the main pedestrian safety threats and concerns, then the subsequent proposed mitigation measures should be targeted to address those specific problems across all proposed alternatives. Expanding a tour bus ban to all proposed alternatives is one option. A visitor permitting system with limits[3] is another tailored mitigation measure that may be considered. A complete realignment and unfettered access to expanded parking may not be the best solution when the precise problem is not well analyzed.

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Section 3.11 Public Facilities
(Ionatana Tua, Olivia Wang, and Kellie Wong)

Section 3.11 regarding Public Facilities appears to be lacking in breadth and depth. The purpose of this DEA is to address pedestrian safety, the shoreline erosion, congestion, and reliability of highway operations within the project limits. Within section 3.11, many of these categories are absent in discussion and analysis. Analyses on the important facilities that may be affected are absent. The DEA should include more information on how there may need to be new facilities implemented due to the proposed parking lot, as outlined by the preferred Pedestrian Shift Alternative.

<u>3.11.1 Existing Condition</u>

This section of the DEA demonstrates a cursory coverage of impacts to facilities available in the vicinity of Laniākea beach.

- It is noted that homes in the project area are served by public utilities (water, electricity, sewage) and private utilities (Hawaii Telecom, Hawaii Electric Company) with further acknowledgement towards the extra burden placed on the lifeguards at Laniākea who are required to act as first responders to incidents at the beach due to the distance of the nearest emergency services (Waialua Fire Station) and the traffic congestion observed along the road.
    - Nowhere in this section are any other public facilities and services in the area, such as public bathrooms, showers, or rubbish bins, addressed. Are there currently any of these facilities at the site? If so, what is their current usage rate and maintenance status? This seems like important baseline knowledge to convey so that we may better understand how increased visitor traffic to Laniākea as a result of this project may affect the use of these types of facilities.

[3] *See* model system at Hāʻena State Park, which is now subject to daily visitor limits and requires advanced reservations to enter the park.

- The draft points out that there is only one lifeguard tower at the beach, but the rest of the section does not address how increased traffic to the beach will impact the capacity of the lifeguards at the site. Will more lifeguards be stationed in the area to handle the anticipated increase in visitors? Already the lifeguards on O'ahu have had to limit coverage due to expanded hours; how will adequate coverage be assured and is coverage for a larger tourist crowd at Laniākea "fair" given high usage in other areas of the North Shore?

<u>3.11.2 Potential Impacts</u>
Pedestrian Shift Alternative

- According to this alternative, moving the highway inland would keep it open during high surf, which helps further one of the project's purposes of improving roadway reliability. This alternative would reduce congestion and allow easier passage of emergency vehicles, both of which further the project's purposes of congestion and roadway reliability.
    - According to the draft, "water meters, utility poles and sewer manholes would remain accessible for maintenance along the currently existing highway," and no changes to the utilities are anticipated. However, the draft does not address how shoreline erosion may affect these utilities that remain along the existing highway. Given that one of the secondary reasons for this project is to address impacts of shoreline erosion to the currently existing highway, how will public utilities along the old highway be protected or mitigated from weather and erosion impacts?
        - As mentioned previously regarding Section 3.11.1, if there are public facilities such as public bathrooms, showers, and rubbish bins at the beach, this draft does not address any of the potential impacts to those facilities that increased visitor traffic may result in. If there currently are no such public facilities such as public restrooms or trash bins available in the area, this seems like a major concern given that the project would increase visitor access to the beach.
    - There is a lack of discussion with how electricity consumption rates might change with this alternative's proposal to install new poles for lighting every 120 feet along the highway.
        - Currently, electricity and telephone/cable lines are on poles that also provide highway lighting (3.11 Public Facilities and Services). With this alternative's proposal to install new poles for lighting along the mauka side of the highway, how will this impact the existing poles which have lighting, electricity, and telephone/cable lines attached to them. Will the new poles interfere with the current poles?
    - According to this section, "[n]o changes to utilities serving this area would be made." One of the components of this alternative is to improve drainage (2.4

Pedestrian Shift Alternative). This portion of the draft does not address how the drainage system will be affected or improved. Rather, this section says that "[n]o changes to utilities serving the area would be made."

<u>3.11.3 Avoidance, Minimization, and Mitigation Measures</u>
Pedestrian Shift Alternative

The DEA mentions a plan for implementing "access controls at Pohaku Loa Way to prevent the private road from being used as overflow parking for beach access, as well as to discourage inadvertent motorized uses of the shared-use path." How will that overflow control be monitored and enforced?

- As mentioned previously regarding Section 3.11.2, it sounds like leaving public utilities along the old highway will not protect those utilities from the effects of shoreline erosion. The reliability of the public utilities if they are left along the old highway needs to be addressed in the assessment.
- One component of the project is removing the makai lane of the original highway and revegetating it (2.4 Pedestrian Shift Alternative). However, potential impacts to the utilities along the original highway during the lane removal and revegetation should be addressed in the assessment .

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3.15 Social and Economic Conditions
(Grant Barring, Joel Burgess)

This section highlights how HDOT's Title VI Plan (2019) was designed to fulfill its responsibilities under nondiscrimination regulations and directives. HDOT uses detailed race categories to treat people of different national origins equitably in highway planning, programs, and activities. This information is helpful when thinking about the impacted community and how to integrate Environmental Justice into this project.

The Kawailoa Census Tract, which includes the project area, is compared and contrasted with the population, demographics, and socio-economic conditions of Hawaiʻi and Honolulu County. Given the disparity in Median Household Income by Household and Median Structure Value, how does the project plan address this? Do the U.S. Census Bureau (2017) characteristics include average lot size for the Kawailoa Census Tract compared to Hawaiʻi and Honolulu County? Are the Kawailoa Census Tract numbers different from other areas because of the increased tourism caused by Laniākea Beach? How many people living in the Kawailoa Census Tract commute to and from Honolulu, and at what frequency? More information would be helpful for the reader to grasp the state of the community and the context in which it exists.

The section concludes by stating that impacts on air and noise will be temporary and are outweighed by the “benefits” of a safer roadway and “overall enhancement to the quality of life,” which seems like an overall generalization when considering that the project will attract more tourists than ever before which will likely not benefit the quality of life for North Shore residents. There are also no plans to mitigate the social and economic conditions that will change with this project. In this draft, it would be helpful to indicate how North Shore residents will be affected by the increase in tourists and any plans to mitigate overcrowding at the beach.

3.16 Construction Impacts
(Hiʻilei Casco, Palakiko Chandler, Kendrick S. Chang)

3.16.1 Maintenance of Traffic and Parking

This section addresses the impact to motorists traveling along Kamehameha Highway if they choose to move forward with the Pedestrian Shift Alternative. The whole project will take a total of 24 months to complete, and the DOT plans to install proper signage on the streets around Laniākea and establish communication methods with the Laniākea and North Shore communities.

However, given that the project schedule is expected to continue over the next 24-months, the DEA fails to address where tourists and locals alike can park and access Laniākea. In Sections 3.9 and 3.10 Roadways, Traffic and Pedestrian Safety are addressed, but only in regards to before and after the completion of the project, and not during construction.

A construction site will not deter tourists from seeking out turtles at Laniākea, and their cars will congest the local communities and streets in the surrounding areas. What measures will be taken to keep pedestrians safe during this time? Are these side streets maintained enough to support the increase of cars, people, and traffic during this construction period? Will the local residents be given parking permits to ensure that they have street parking near their own homes?

This is also a rural community, so how will traffic affect emergency service times? These are questions that need to be considered and answered that the DEA fails to adequately address. Although the Laniākea project will not conduct continuous work activities around the clock, these are still things that need to be considered and planned for, especially for a 24-month project.

3.16.4 Water Resources

In compliance with the constitutional mandate under the Public Trust Doctrine, the DEA, as prepared by the DOT, should ideally demonstrate the State’s fulfillment of its affirmative constitutional duty to protect water resources. We contend, however, that the DEA still lacks detailed considerations with respect to the protection of water resources. To note, we identified two potential impacts to water resources, as mentioned in Section 3.16.4, that merits further assessments and analysis as follows:

(1) Section 3.16.4 states that limited access during construction will "require parking in other locations than the informal area on the mauka side of the Highway where people now park." The DEA does not provide any details in terms of alternative parking sites during construction. We would have expected the DEA to further specify alternative parking areas and an assessment whether those alternative sites would pose any impacts to water resources. Further, the DEA should identify alternative routes that would enable safe access to Laniākea Beach. Unregulated parking and access routes during construction could inadvertently impact water resources in the event that irresponsible people choose to create an alternative path that is harmful to water resources.

(2) Section 3.16.4 acknowledges that the project contractor will obtain the required permits through the NPDES program and noted several construction best-management-practices ("BMPs") that would minimize sedimentation and improper waste disposal. We are concerned that the DEA, in its current form, discusses BMPs in generalities, and that the DOT is merely relying on the representations made by the project contractors. As previously noted, the State has an affirmative duty to protect water resources pursuant to the Public Trust Doctrine, which includes the duty to monitor the practices of third parties. We, therefore, urge the DOT to provide additional details and assurances that the identified BMPs will provide sufficient protection of water resources from construction impacts.

3.16.5 Biological Resources

Section 3.5 of the Draft EA describes various plant and animal species found in the area. For example, the DEA lists the dominant vegetation types, plant and wildlife habitats, and key animal species including native birds, bats, and turtles. Unfortunately, the construction impacts on most of these species and habitats are not similarly addressed in section 3.16.5.

Section 3.16.5 only addresses impacts on wildlife without any discussion as to how construction of the Project might impact native species in the area, nor how construction can enable the spread of invasive species. For example, clearing invasive tree species (e.g., cutting off tree branches) to make space for the construction site might indirectly disperse seeds or pollen into areas outside the construction site. Construction equipment used in other sites may bring in invasive species (e.g., toxic devil weed that is a serious problem in mauka areas of the North Shore).

A deeper discussion on construction impacts on indigenous bird species is also merited because of the Project's large geographic coverage and specific location. Some indigenous bird species found in the area include migratory shorebirds like the Pacific Golden Plover (Pluvialis fulva) and the Ruddy Turnstone (Arenaria interpres). Seabird species include the Wedge-tailed shearwater (Ardenna pacifica, also known as Uau Kani), the endangered Hawaiian Petrel (Pterodrama sandwichesis), and the threatened Newell's Shearwater (Puffinus auricularis newelli).

While Section 3.16.5 does discuss efforts to minimize construction lighting impacts on these species, that is the extent of the analysis. The DEA lacks any examination of other potential impacts, such as how construction noise might interrupt nesting patterns or interspecies communication, nor how the physical presence of construction equipment might scare or otherwise dissuade these species from being in their natural habitat area. These impacts are important because these species are native and/or listed as threatened or endangered under Section 7 of the Endangered Species Act. Any effects on how construction activities and the new makai parking lot might affect or displace these species should be considered in light of these legal protections.

Lastly, while it is important to identify construction impacts that directly affect individual species, it is also critical to examine any negative effects construction might have on larger habitats and ecosystem zones as a whole. For example, Section 3.16.5 should provide a discussion on how construction activities might affect: the food, water, or other resource availability for the species already described, any intrusions on physical habitat (e.g. clearing trees or branches may disrupt nesting sites), the connectivity between habitats, and any alterations to habitats that may make them more vulnerable to natural predators, humans, natural phenomenon (e.g. vulnerability to extreme weather events), and climate change. A broader look at how construction activities influence the overall health of the larger habitat ecosystem will ensure this project does not sacrifice the integrity of the flora and fauna of the area.

3.16.6 Solid Waste Management and Hazardous Waste

In 3.16.6 the DEA outlines the requirements for contractors. However, the DEA fails to address the possibility of their requirements not being met, and any fines or consequences the contractor will face if they do not follow procedures. Laniākea is a sensitive coastal and beach habitat. Even if road sites under construction follow all procedures, it is simply not enough to keep up with the rubbish and nuisance that these sites emit including: napkins, plate lunch plates, dirt, odor, and dust. With the beach and Honu present in the vicinity of the Project area, it is imperative that HDOT goes above and beyond the regular scope of procedures to make sure that the project site does not contribute to the degradation of the local ecosystem. How will this be monitored and enforced?

Has the Department asked any help from federal agencies or other state agencies who have a stake in protecting beaches and endangered wildlife from solid or hazardous waste? These are all missing parts of the analysis that is not included in the DEA.

In 3.13.1, the DEA addresses hazardous waste for the Project, but also fails to specifically address mitigation efforts if hazardous materials will affect the ecosystem. The negation of these potential impacts merits further consideration that should be addressed before Project work commences.

3.17 Consistency with Government Plans, Policies, and Controls
(Alyssa Couchie, Christian Doles, Mona Heydarian)

3.17.1 State of Hawaii Plans and Land Use Controls
Hawaii State Plan Transportation Functional Plan

- "This project would address congestion, one of the four issues considered most critical in the plan" 3.17.1 at 3-53. The document admits in section 3.18.1 Potential Secondary Impacts that "By creating safer access to the beach, more tourists may come, and add to the pressure placed on resting turtles and coastal resources . . ." How would the project address traffic congestion if there is no discussion about the reason why there is increased traffic in the first place, which are the turtles and other wildlife?
- The Pedestrian Shift Alternative (PSA) projects an estimated capacity of 90 cars, up from the 50-60 car capacity in the no-build alternative. A potential impact of increasing accessibility to the beach will likely be a greater number of tourists and visitors to Laniākea. As traffic congestion is one of the four issues considered under this plan, how would the PSA continue to minimize congestion once all 90 car parking spaces are full? Once all spaces are occupied, what prevents additionally bottlenecking along the proposed relocated highway, resulting in traffic and delays? Increasing accessibility may provide safer access to the beach, however, would seem to still run a risk for congestion.

Hawaii 2050 Sustainability Plan
"The Hawaii 2050 Sustainability Plan, July 2021 (Hawaii State Plan), prepared pursuant to HRS 226-65, serves as strategic action plan for climate and sustainability for the next ten years (2020- 2030)."
- The DEA briefly mentions consistency between the goals of this project and the eight focuses of the Hawaii 2050 Sustainability Plan. Of the eight focus areas listed under this plan, two focus areas--number three (Improve Climate Resilience) and seven (Preserve the Natural Environment)--seem most applicable to this proposed project. With the anticipated increase in number of visitors to Laniākea beach with the suggested increase in accessibility to the beach this project would provide, what considerations are in place to minimize human effects on coastal erosion and overall human impact to the beach? How is this plan increasing the resilience of the shoreline against human traffic, litter, and erosion apart from coastal revetment?

- Natural resource protection is one of the eight focus areas under the Hawaii 2050 Sustainability Plan. Although this project theoretically increases safe accessibility to the shoreline, it does not address any safety measures regarding the impact of the increase in visitors to the shoreline on the local marine ecosystem and wildlife (resting Honu and other wildlife in the area). What measures will this project take to protect the natural local ecosystem against a greater number of visitors to the beach?

Coastal Zone Management, Chapter 205A-2 of the Hawaii Revised Statutes

- <u>Coastal Ecosystems</u>: "The Pedestrian Shift Alternative would not only protect coastal ecosystems, it would benefit them by reducing and scaling back urban encroachment." 3.17.1 at 3-56. How does increasing the amount of parking available from 50-60 spaces to 90 spaces, moving the parking closer to the coastal zone, and increasing the amount of people visiting Laniākea protect and benefit the coastal ecosystems?
  How will the Pedestrian Shift Alternative reduce and scale back urban encroachment? This alternative seems more likely to encourage people to come and visit this area, which will actually increase the amount of development that will happen in this area. Companies are more likely to increase building and urban encroachment in order to take advantage of the better road infrastructure and tourists that will be visiting.

- <u>Managing Development and Public Participation</u>: "The Pedestrian Shift Alternative has been developed through public participation. As discussed in Section 2.4 and Section 2.5, it is largely based on the Quinlan Realignment Alternative, which was strongly advocated by the community . . .HDOT met with residents at Pohaku Loa Way, residents on the Haleiwa side of Laniākea Beach, Kamehameha Schools, the City DPR, and local ranchers to develop the Pedestrian Shift Alternative design." 3.17.1 at 3-56 and 3-57. How many community members advocated for the Quinlan Realignment Alternative? Were those community members that advocated for the Quinlan Realignment Alternative the same community members that HDOT met with at Pohaku Loa Way and Haleiwa? How many residents were consulted at Pohaku Loa Way and Haleiwa? Were the residents' input, comments, or concerns incorporated into the Pedestrian Shift Alternative?

<u>Marine Resources:</u>

- "The pedestrian shift will have no adverse impact on marine resources" and "revegetation would benefit the coastal ecosystem." There should be more explanation to these conclusive statements. How will the project not have an impact on marine resources? How will this project benefit the coastal ecosystem?

<u>3.17.2 City and County of Honolulu Plans and Controls</u>

North Shore Sustainable Communities Plan

- This section discusses how the proposed project would keep Kamehameha Highway as a two-lane highway consistent with the region's rural character and rural lifestyle. However, it seems that with an increase in the parking space this will increase the amount of traffic on the highway. How will the project keep the highway consistent with the region's rural character, especially if it is widened and improved on, and with the increased capacity for tourists in this area? This seems as though it will encourage more people to use this part of the highway and visit Laniākea, creating additional congestion.

The Department of Planning and Permitting's consultation letter, in Appendix A-1 pg. 145, states this Draft EA "should disclose how the various project alternatives will be consistent with Hawaii Revised Statutes Section 205A-2 and Chapter 25, Revised Ordinance of Honolulu (ROH)." On this note, to be completely transparent with the public and those that are involved with this project, the Draft EA "should identify any significant adverse environmental or ecological effects and specify which elements of the Project would be considered "development" for purposes of Section 24-1.3, ROH." The DEA does not appear to address these concerns.

The DEA seems to ignore or only superficially cover the fact that this is a State Conservation District. More discussion is needed regarding the secondary and cumulative impacts on that conservation district.

3.18.1. Potential Secondary Impacts
(Cale Honda, Joho Horton)

- The DEA fails to quantify secondary impacts on Honu and other endangered species such as Monk Seals. HDOT claims "[t]here is no way to reasonably quantify" the secondary impact on the project on these species. HDOT has already estimated the current number of vehicles that park on the mauka side of the highway during peak hours at fifty to seventy and the number of pedestrians that cross the Kamehameha Highway fronting Laniākea Beach every hour from 11:00 AM to 4:00 PM at 200 to 300 people every hour. (See 1.5.1). HDOT knows their proposed Pedestrian Shift Alternative will create ninety (90) new parking spots for vehicles and will allow a safe area for tourists to alight from buses. Based on the current trend of 200-300 pedestrians per hour crossing over from the current mauka side parking lot five hours a day, one could predict that the preferred project will increase the number of tourists visiting the sea turtles by **fifty percent** based solely on the increased number of parking spots.
- HDOT can also estimate the number of tourists that tour buses would drop off at the new parking lot using current tour bus data. Even estimating only one bus every thirty minutes, the preferred pedestrian shift alternative could increase the number of tourists travelling to Laniākea to see the sea turtles by at least **100%** (400-600 per hour).
- Although most tourists respect the Federal laws protecting these endangered species, there will always be a few who ignore them and harass and molest these majestic

animals. Even if just one percent of the total visitors violate these laws, any project that proposes to increase the number of visitors to Laniākea Beach will increase the number and frequency of illegal interactions with the protected species that use Laniākea Beach. For these reasons, HDOT's assessment in 3.18.1 stating their inability to quantify the secondary impact on the Sea Turtles at Laniākea beach should be reevaluated.

App. A-1 Pre-Scoping (agencies, officials)
(Kendrick Chang)

We acknowledge and appreciate the DOT's exhaustive recipient list of Federal, State, and County agencies, elected officials, organizations, and stakeholders who received correspondence regarding the scoping request in preparation of the DEA. Only a minority of the recipients submitted a response to the DOT's scoping requests (around 35 responses received out of approximately 100-plus recipients). Given the importance of this project and its controversial history, DOT should continue community engagement and consultation activities through the remainder of the environmental review process, especially outreach to residents and community members who will be most impacted by this proposed Project.

The distribution of a single email or letter correspondence to a select group of individuals or entities may meet the minimum but does not constitute meaningful community outreach. The intent of the public records and notice requirements under HRS 343-3 is to embrace public comments to help inform the State and applicants of environmental concerns. To upholds the spirit of meaningful community outreach as expressed in HRS Chapter 343, and to help overcome a history of community skepticism about DOT's project planning processes, DOT should strive to exceed the minimum requirements provided under the law.

Thank you for considering our comments. We look forward to your responses in the FEA or the EISPN.

Sincerely,

Denise Antolini

Professor Denise Antolini
Fall 2021 Environmental Law Classes

Appendix

A-3

Regulatory Coordination

PROJECT NAME	Kamehameha Highway Pedestrian Safety Project
DATE	18 June 2020
TIME	9:00 a.m. – 10:00 a.m.
VENUE	Virtual (Microsoft Teams)
SUBJECT	Discussion With the State Historic Preservation Division (SHPD) Regarding Chapter 6e-8 Approach
CLIENT	State of Hawaii Department of Transportation, Highways Division (HDOT)
PRESENT	SHPD: Susan Lebo HDOT: Ken Tatstuguchi, Brian Tyau ASM Affiliates: Robert Rechtman WSP: Dexter Eji, Rachel Adams, Malie McClellan

- The project will not be using any federal funding.
- ASM: planning to start field work Wednesday, June 24, 2020. It is anticipated that to augment the work that CSH previously performed in the area, ASM will conduct work in an additional 7 trenches.
- The work area is roughly 550-570 meters long, and approximately 100 feet wide, mauka of the existing Kamehameha Highway.
- The proposed project will not be affecting the existing bridge over Laniakea Stream. Lauhulu Bridge is on the inventory list.
- There are two stone enclosure sites in the project area as well that should be considered.
- Monitoring will be proposed for work in the sandy (Jaucus sands) areas for pavement removal; HDOT noted that they would likely agree to this mitigation effort.

FOLLOW-UP ITEMS

WSP: Draft updated figures with APE, known / noted resources sites

WSP: Initial plans with streetlight and guardrail post locations / spacing

WSP: More in-depth discussion regarding construction methodology

WSP: Reach out to Historic Hawaii Foundation, and verify inclusion on the project mailing list (*added to mailing list June 18*)

WSP: Provide updated figures to SHPD (ASM work area, locations of streetlights and guardrails, etc.) for reference (*provided June 18*)

State Department of Transportation
Highways Division

Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach

Meeting Summary

Thursday, November 14, 2019 11:00 a.m. -12:15 p.m.

1. Introductions / Attendance
    - HDOT
        - Ken Tatsuguchi
        - Misako Mimura (via phone)
    - DLNR
        - Carol Tyau-Beam
    - CCH-DPP
        - Mario Siu-Li
    - WSP
        - Dexter Eji
        - Rachel Adams
        - Jan Reichelderfer
        - Malie McClellan

2. Project History / Purpose of Project
    - Pedestrian Safety – pedestrian accident on August 1 2019
        - HDOT funding and therefore focus was on designing the project to address shoreline erosion
        - Barriers had been installed along the mauka edge of the highway to prevent use of the unimproved parcel (owned by CCH) for parking, but due to a lawsuit regarding process / jurisdiction they were removed
            - The barriers effectively closed off the unimproved parcel that had historically been used as an illegal parking area (No Parking signs are posted), and this was argued as an access issue, along with other complaints by area users
        - Shoreline erosion remains an important consideration, but pedestrian safety is a more immediate concern that needs a design consideration that can be constructed quickly
        - Ultimately, HDOT is working to minimize the potential for pedestrian / vehicle conflicts

- Secondary Objectives
    - Vehicular Congestion
    - Beach Access

3. Alternatives
    - No Build
    - Transportation Systems Management (TSM)
    - Build Alternative Design Elements
        - Pedestrian Shift Alignment Alternative
            - HDOT is mindful of their budget and they need to be considerate of the needs of the entire state
            - This would shift the roadway 50 feet mauka (from the existing edge of pavement to the proposed alignment's new makai-side edge of pavement)
            - The proposed design was initially closer to the existing Kamehameha Highway, but was shifted mauka per resident input
            - The proposed alignment wasn't shifted more mauka due to the consideration of existing historic, cultural, and archaeological resources that have been identified in the area
            - The roadway would be raised roughly 3 feet, which isn't necessarily above the storm surge inundation zone (or projected sea level rise depending on year being evaluated) but would provide a time buffer for HDOT while allowing for continued highway system operations
                - The Base Flood Elevation (BFE) is roughly 22-23 feet, and this alignment would be at approximately 20 feet
                - The roadway would be designed to be titled downward from makai to mauka so that runoff would enter a swale and then Laniakea Stream
            - Access to the unimproved parcel would remain (parking would not be sanctioned by HDOT)
            - Kamehameha Highway could remain as a "frontage road" but would require design elements to deter nuisance parking, etc.
            - The existing driveways for residents on the Haleiwa side of the alignment would be extended as needed, and would include the construction of culverts
        - Most Realignment Alternative
            - This alignment would continue to be evaluated
            - The alignment starts at the same location on the Haleiwa side of the project, but would go farther mauka and extend further to match the existing Kamehameha Highway in the vicinity of Chun's Reef
            - This roadway would also be raised, but the design hasn't progressed that far at this time

4. Advice on Studies Needed/Planned and Regulatory Requirements – Letter of Map Amendment (LOMA) or Letter of Map Revision Based on Fill (LOMR-F)?
   - The project team understands that the regulations / requirements regarding work in floodplains are undergoing updates and wants to coordinate early with DLNR and CCH to ensure compliance
     - NFIP requirements are being updated by FEMA now and briefings are anticipated soon
   - The project team will look at FEMA's description regarding what constitutes "development"
     - It was noted that this seems to address almost any change to the surrounding area, so it is likely that the project will be considered a "development", unless the TSM Alternative is selected
   - Grading efforts are likely to be considered as their own category of sorts
   - Previously, HDOT projects haven't needed CCH approval
     - CCH doesn't take jurisdiction of work efforts within HDOT ROW, but the project as proposed would require work outside of HDOT ROW for either of the Build Alternatives
   - CCH has been requesting updated and more involved studies

5. Other Items Discussed
   - Mandatory compliance with FEMA regulations is required for projects that use federal funds
     - DLNR noted that even though this project is not using federal funds, these standards are what should be followed
     - These standards can be considered building blocks regarding the types of requirements that should be considered / implemented
     - New FEMA direction is anticipated to ask for state agencies to comply with their regulations
     - If projects are non-compliant, then FEMA assistance can be suspended (no federal assistance for disaster impacts, etc.)
     - DLNR is working with the Governor's office to begin discussions with state agencies
   - DLNR is still developing / building the Flood Management Program, but will work with the project to assist in providing direction and input
     - Clear guidelines to be established
     - Certain exemptions exist when conditions simply don't allow for the appropriate / mandated design to be applied
   - Structures that were built prior to the implementation of FIRM regulations are considered non-conforming and if work is done that costs more than 50% of the market value of the structure, even if it remains in the same footprint, the structure then needs to be brought into compliance
   - There will be bridge-related construction:
     - The Pedestrian Shift Alignment Alternative will clear-span Laniakea Stream with a new bridge, while the existing bridge will remain in place
     - The Most Realignment Alternative would clear-span Laniakea Stream as well and leave the existing bridge in place, and would also clear-span a second stream, Kawailoa Stream, with a new bridge and leaving the existing bridge in place

    - Changes to bridges, or construction of new bridges, even if considered an improvement for an area, can result in a dramatic difference in the overall environment
        - Changes in the overall BFE, for example, could lead to different requirements for other projects in the area
        - Changes should be documented so that projects are working with the most up-to-date information
        - The documentation of such changes is done through the LOMR process with FEMA
- Stream(s) need analysis to ensure the project wouldn't affect processes, cause / worsen flooding, etc.
- Coastal surge processes should be analyzed to ensure that raising the elevation of the roadway by 3 feet won't result in deflection of storm surge waters into adjacent areas
    - Would it raise their BFE?
    - Could have implications for them (insurance, etc.)
- The existing coastal studies are old, there has been discussion of updating them
    - DOH has done some studies regarding susceptibility of areas
    - North Shore is more susceptible to XX
    - South Shore is more susceptible to hurricane surges
    - The project has a coastal engineer on staff who has been reviewing background information and existing resources
- Meetings were held with makai landowners
- Mauka landowners include CCH and KSBE
    - KSBE appreciated efforts to design the alignment so as to avoid / minimize the potential for impacts to historic, cultural, and archaeological resources
    - KSBE also appreciates an alignment that would minimize the potential for disruption to its traditional wayfinding educational area, Kahokuwelowelo

6. Regulations
    - DOT 5650.2
    - 23 CFR 650A
    - 44 CFR 50.1: definitions
    - 44 CFR 60: overall
    - 44 CFR 60.3
    - 44 CFR 65: overall – mapping
    - 44 CFR 65.3: requirement for new technical data
    - 44 CFR 65.10: not coastal, but can still look through for reference

7. Action Items
    - The project will work with Curtis to get input regarding design approach, requirements, etc.
    - The Draft EA (anticipated March 2020) will be sent to CCH and DLNR for review

MEETING NOTES

KAMEHAMEHA HIGHWAY LANIĀKEA REALIGNMENT

Subject/Purpose: Scoping meeting

Date: June 8, 2011 **Time:** 9:00

Place: DLNR-OCCL office
Kalanimoku Building, 1151 Punchbowl Street, Room 131

Attending: DLNR: Sam Lemmo
HDOT: Darell Young
PB: Jim Hayes and Dexter Eji

Mr. Lemmo thanks HDOT and PB for meeting with him and OCCL. He does not think OCCL will be a significant direct stakeholder but is interested in seeing the project succeed and achieve some of his offices goals related to (a) the Coastal Hazard Management Plan, (b) managing a retreat from the shoreline where possible, and (c) understanding shoreline erosion processes. The one exception to his office being a sideline stakeholder would be if the project (a) wants to do some sort of shoreline hardening/revetment, or (b) wants to add sand or something to the beach area after removing existing road; both of these activities could require a Conservation District Use Permit (CDUP).

Sam feels the project really could be a high-profile project nationwide, a good feather in HDOT's cap in terms of good coastal and infrastructure stewardship. It would be good because it would show responsible actions in the face of shoreline erosion and sea level rise issues. However, HDOT really needs to want the project because a realignment that really addresses all the issues is probably not the most cost effective. He encourages the HDOT to move in the right direction though.

Mr. Lemmo mentions that there has been a rumor regarding what would happen with the old (existing) road should a realignment project proceed – the rumor says that the old road would be kept as a bypass road or something. Discuss that HDOT does not operation parallel routes. Should this project result in a realignment, HDOT would most likely turn the existing road over to the City for use as they need – access to parks, assess to residents. It is also possible at least portions of the existing road would be removed, particularly where coastal erosion is an issue. Sam indicates that if a portion of the road was removed, along with the boulders protecting it from beach erosion, a CDUP probably would not be needed, but as stated above, if you then added sand or something to the area a CDUP probably would be necessary.

Discuss alternatives. Discuss that no alternative is set. Have heard a lot of things, such as:

- Realign to cane haul road as shown in 2006 DLNR letter.
- Realign just a little (40 or 50 feet) as shown in the HDOT erosion study.
- Realign somewhere between those two, just to the extent necessary to fit parks on makai side of road or something.
- Leave the road where it is now but raise it up.

- A number of short-term improvements were brought up at the public meeting and something may be done as a demonstration or something in the short-term.

Sam seems to prefer the alternatives that realign further inland, at least so the parks can be on the makai side of the road. He worries about raising the road in place because it would require some revetment or hardening that could impact the beach, erosion, shoreline processes, and beach inhabitants (seals and turtles). Darell discusses that something like that could be an alternative but is unlikely to move forward due to Section 4(f), T&E, and other issues. Sam also believes a large number of coastal activities would oppose anything along those lines. Sam says something like a revetment could be permitted, but is typically only permitted where there is no beach and the road is the primary resource in the area (i.e. Launiupoko on Maui). (Comment: Sam said something to the effect that armouring could be a cost effective alternative but tough to implement)

Discuss land swap. Sam says Peter Young was leading that effort and met with Kamehameha Schools people a few times. Sam is not sure how the discussions went of where the land being considered was located. Mr. Hayes indicates that Peter Young has mentioned something about Heeia and Sam says that is possible. Sam suggests that the current DLNR Chair, William Aila, be involved should a land swap become a possibility again.

Discuss Task Force:

- Sam is not interested in being on it.
- Sam says Dolan Eversole is a great guy and would be a good addition to the Task Force. Dolan could provide great expertise regarding coastal processes and OCCL-like concerns.
- Sam also suggests Steward at Surfrider or George Downing of Save Our Surf as possible Task Force people.

Discuss project next steps. Mr. Hayes explains that we will be setting up the task force and do not really see any need for DLNR involvement unless the Task Force starts thinking big shoreline revetments are a good idea. In a situation like that it may be beneficial to have OCCL do a presentation for the Task Force to help them understand the environmental impacts and history of such projects in Hawaiʻi. Sam says he would be happy to participate if that would be helpful.

Follow Up Items

Possibly contact people mentioned for task force consideration.

D11R0702

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

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

May 23, 2017

2017/ELOG-972 (RLD)

Mr. Ford N. Fuchigami, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Fuchigami:

SUBJECT: Department of Planning and Permitting Consultation
Federal Aid Project No. NH-083-1(74)
Kamehameha Highway Realignment
Vicinity of Laniakea Beach - Haleiwa

This is in response to your letter received on May 10, 2017, in which you are requesting for comments on the proposed Kamehameha Highway Realignment, which is in the vicinity of Laniakea Beach in Haleiwa. Both the "Minor" Realignment and "Most" Realignment Projects are located within the Special Management Area (SMA) and are subject to the requirements of Chapter 25, Revised Ordinances of Honolulu (ROH). Pursuant to ROH Section 25-1.3, both Projects are not within the existing rights-of-way and are considered development; therefore, an SMA Permit is required. The "Minor" Realignment revetment improvements within the 40-foot shoreline setback area will require a shoreline setback variance. Both permits may be processed concurrently.

As the Project valuation will exceed $500,000, a SMA Major permit will be required. The permit applications must include a complete description of the Project, its purpose, time frame, and valuation, as well as scaled plans showing the location of the Project relative to the shoreline. If the Project is located within 55 feet of the shoreline, a certified shoreline survey is also required. Thank you for the opportunity to comment on the proposal. We look forward to reviewing the Environmental Assessment for the Project.

We hope that this information was helpful. Should there be any questions, please contact Ronaldo L. Dalisay of our Land Use Approval Branch at 768-8019.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

'17 ... 3 45

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

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Ref. No. P-15690

August 7, 2017

To: Ken K. Tatsuguchi, Engineering Program Manager
Department of Transportation, Highways Division, Planning Branch

From: Leo R. Asuncion, Director

Subject: Hawaii Coastal Zone Management (CZM) Program Consultation for Kamehameha Highway Realignment, Vicinity of Laniakea Beach, Haleiwa, Oahu
Federal Aid Project No. NH-083-1(074)

In response to your request for Hawaii CZM Program consultation with regards to CZM policies and regulatory requirements, we are providing the following comments and information.

CZM federal consistency review is applicable to two federal actions involved with the project:

1. CZM federal consistency review is required for the State of Hawaii Department of Transportation use of Federal Highway Administration (FHWA) funds for the project.

2. CZM federal consistency review is potentially required in conjunction with the U.S. Army Corps of Engineers Department of the Army (DA) Permit, if applicable, for shoreline and/or in-water work seaward of Kamehameha Highway, and also for the stream crossings associated with both alternative alignments.

Both CZM reviews can occur concurrently provided that all of the information for the DA Permit is available at the time of filing the CZM application. Otherwise the reviews will be conducted separately, with the review for FHWA funding occurring first.

The project should be assessed for consistency with Hawaii CZM Program policies by using the *Hawaii CZM Program Federal Consistency Assessment Form*, which is available from our web site: http://planning.hawaii.gov/czm/federal-consistency/. The CZM Program policy areas that will be considered in the consistency evaluation are prescribed in Hawaii Revised Statutes § 205A-2 Coastal Zone Management Program objectives and policies: recreational resources; historic resources; scenic and open space resources; coastal ecosystems; economic uses; coastal hazards; managing development; public participation; beach protection; and marine resources.

The following information, listed according to each alternative, will be required for the CZM federal consistency review.

All Project Alternatives

Identify the impacts associated with both the construction activities and the completed project. Provide the proposed mitigation measures, including best management practices, for the anticipated impacts.

Provide information on stormwater management and polluted runoff prevention that will be used both during construction and post-construction.

Special Management Area (SMA) and/or Shoreline Setback requirements may be applicable to portions of both alternative alignments and will need to be addressed for the CZM federal consistency review.

If a DA Permit is required, then the CZM federal consistency application must include copies of the applications for required permits, including: the DA Permit; the Department of Land and Natural Resources Conservation District Use Application, and the Stream Channel Alteration Permit; the Department of Health Section 401 Water Quality Certification, and the National Pollutant Discharge Elimination System Permit; and the City and County of Honolulu SMA Permit and/or Shoreline Setback Variance.

"Minor" Realignment

Provide an analysis of the effects on scenic and open space resources due to the raised level of the new highway, which could be as much as ten feet higher than the current highway. Provide the proposed mitigation measures for the effects on scenic and open space resources.

Identify both the short-term and long-term coastal effects caused by the new shoreline revetment. Provide the proposed mitigation measures for the coastal effects.

Provide information on how public access, both to and along the shoreline, will be affected by this alternative alignment. Explain how public access will be maintained both during construction and post-construction.

Identify the effects that the new revetment will have on recreational uses along the shoreline area in the vicinity of the project area. Provide the proposed mitigation measures for the effects on recreational uses.

"Most" Realignment

Realigning Kamehameha Highway inland from its present location is intended to reduce the highway's vulnerability to coastal erosion and coastal inundation. Provide information on whether this alternative includes measures to address long-term coastal erosion in the vicinity of the project area, and what those measures are.

Provide information on what will be done with the existing highway after Kamehameha Highway is realigned mauka of its present location.

Thank you for consulting the Hawaii CZM Program. These comments and information are based on the general information provided about the project. When more detailed information is available we encourage follow up consultation for the CZM federal consistency review. If you have any questions, please call John Nakagawa of the CZM Program at 587-2878.

INFORMAL MEETING SUMMARY

KAMEHAMEHA HIGHWAY LANIAKEA REALIGNMENT

Subject/Purpose: CZM and OCCL Considerations and Input on the Alternatives

Date: September 29, 2017 **Time:** 1:30 p.m.

Place: WSP conference room

Attendees: John Nakagawa (CZM), Shichao Li (CZM), Sam Lemmo (OCCL), Ken Tatsuguchi (DOT), Darell Young (DOT), Rachel Adams (WSP), Jan Reichelderfer (WSP) and Dexter Eji (WSP)

The following is a summary of the meeting discussion:

1. Project Background:

Rachel introduced the project by explaining that the purpose of the project is to protect the highway from erosion, rather than reducing congestion. Congestion, however, was the main concern expressed by the community. There were multiple alternatives presented at the Task Force meetings including a no-build, revetment wall, the red (most) alignment and several alignments in between. The alignments in between affected historical sites and have been mostly dropped from consideration.

2. Sea Level Concerns:

Sam explained that sea level rise reports often ignore the erosion component – leaving only the "bathtub effect" on maps. Significant landward erosion is predicted as early as 2050. He explained that the revetment would become a "wave backstop". For this project, we've been considering a 1-meter rise and a 3-meter surge and, while DOT uses a 25-30 year planning horizon, we understand road projects last 50-100 years. Sam is going to provide more recent studies and modeling and strongly supports moving the road landward as much as possible.

In addition to sea level rise and erosion, we discussed the issue of having a higher water table. Unlike other parts of the world with impermeable soils, Hawaii's porous geology allows water to rise unimpeded.

3. Beach and Resident Access and Laniakea Beach Support Parks:

Ken showed the potential access routes to the residences Makai of the highway.

Although the City and County of Honolulu has completed EAs, HDOT and WSP indicated that based on meetings with the City, there is no funding for the Laniakea Support Parks, and the development appears unlikely. If the City does not develop the support parks, there is a question where beach-goers will park.

John explained that a central focus of CZM is maintaining public access to the beach for all parties – tourists, fishing and surfing, turtle watchers, etc.

4. Archeological Concerns

Besides the archeological sites shown on the map, DOT has recently learned about a site on a Puu near Ashley Road, which is actively being used as a training site and for stargazing (Ka hoku welowelo) in conjunction with the Polynesian Voyaging Society. KSBE indicated to us in a previous meeting that this site is likely one of the most significant sites that would be affected by the project. KSBE noted that the Red alternative would have light and noise impacts from the highway DOT and WSP have tried to move the alternative as far from the site as possible.

5. Existing Kamehameha Highway:

DOT usually turns roads over to the C&C when they have built an alternative route, but HDOT will be considering a full range of alternatives for what to do with the existing roadway. HDOT does not plan to bring the road up 'to standard' to make the transfer to the C&C. Parking could potentially be provided on the old highway or it could be removed. Shichao explained that SMA concerns could be triggered.

6. State and County Climate Initiatives

The State Climate Commission and the Honolulu Resiliency Office have grant money to look at projects and could be working with DOT. There are 13 erosion areas that will have waivers of state and local permitting. Moving roads inland is often infeasible so agencies need to work with DOT to explore more options.

Action Items:

1. DOT to provide OCCL with the comment request letter that had been previous sent. (Darell forwarded)

DAVID Y. IGE
GOVERNOR OF
HAWAII

RECEIVED
OCT 26 2017
WSP USA INC.
HONOLULU, HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DLNR:OCCL:.SL

Correspondence OA-18-82

OCT 25 2017

MEMORANDUM:

TO: Jade Butay
Director of Transportation

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: Re: Conservation and Coastal Lands Consultation for Kamehameha Highway Realignment, Vicinity of Laniakea Beach, Haleiwa, Oahu; Federal Aid Project No. NH-083-1(074)

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) has reviewed your request to share information and provide input on the proposed realignment of Kamehameha Highway at Laniakea Beach, Oahu. Specifically, you are interested in any regulatory requirements regarding the use of lands for either of two project alternatives, as well as any other input or concerns OCCL may have regarding the proposed projects.

The State of Hawaii Department of Transportation (HDOT) is studying the realignment of Kamehameha Highway in the vicinity of Laniakea Beach on the North Shore of Oahu with partial funding from the Federal Highway Administration (FHWA). Your letter notes that you sent a letter to our office in April 2015 (HWY-PA 2.9513) but did not receive a reply. Our records show that a response was sent to your office in May 2015. In any regards, I apologize if it was not received and thank you for the opportunity to comment again. A copy of DLNR-OCCL's May 2015 letter is enclosed for your reference. It appears the two conceptual realignment options under consideration in 2015 and now in 2017 are generally the same, though your 2017 letter includes some more design details for the "minor" realignment alternative.

The DLNR-OCCL reiterates its recommendation for the "most" realignment alternative for the reasons detailed in our May 2015 letter (enclosed). The highway is presently exposed to erosion and wave overwash during the winter high surf season. The existing boulder revetment is contributing to seasonal beach narrowing and having a negative effect on public shoreline access. A new boulder revetment as proposed in the "minor" realignment will result in beach loss fronting the structure as erosion rates accelerate in coming decades with increasing sea level rise.

The OCCL commends HDOT for their forethought in considering increasing hazards with sea level rise with this project. As you are aware, the DLNR and Hawaii Climate Mitigation and Adaptation Commission are nearing completion of a Sea Level Rise Vulnerability and Adaptation Report (Report) at the end of this year. The Report includes detailed modeling and mapping of increasing vulnerabilities to coastal flooding and erosion with sea level rise.

We have enclosed draft maps of the Sea Level Rise Exposure Area (SLR-XA) modeled at 1 foot and 3.2 feet of sea level rise from the Report data. The SLR-XA is a combined forecast hazard area based on models of passive flooding, annual high wave overwash, and coastal erosion. The SLR-XA depicts areas that are vulnerable to permanent flooding at that sea level height based on one or more of these hazards. Per the draft Report and the latest science on climate change and sea level rise, the 1 foot sea level rise map represents a near-term (present day to mid-century) scenario and the 3.2 foot sea level rise map represents a sea level rise scenario that appears likely in the latter half of this century (within the lifespan of the new road alignment).

Your letter requests input on regulatory requirements, particularly for the "minor" realignment option. It's not clear where the shoreline would be located in your section and plan view in Figure 3. However, it appears some or all of the proposed revetment would fall within the Conservation District. Therefore, the proposed land use may be considered an identified land use in the Resource Subzone of the Conservation District pursuant to Hawaii Administrative Rules (HAR) §13-5-24 P-15 Shoreline Erosion Control (D-1), *Seawall, revetment, groin, or other coastal erosion control structure or device, including sand placement, to control erosion of land or inland area by coastal waters, provided that the applicant shores that (1) the applicant would be deprived of all reasonable use of the land or building without the permit; (2) the use would not adversely affect beach processes or lateral public access along the shoreline, without adequately compensating the State for its loss; or (3) public facilities (e.g., public roads) critical to public health, safety, and welfare would be severely damaged or destroyed without a shoreline erosion control structure, and there are no reasonable alternatives (e.g., relocation). Requires shoreline certification. This use requires a Board permit from the Board of Land and Natural Resources, who has the final authority to grant, modify, or deny any permit.*

Portions of the public road and associated infrastructure seaward of the certified shoreline would likely be considered an identified land use in the Resource Subzone of the Conservation District pursuant to Hawaii Administrative Rules (HAR) §13-5-22 P-6 Public Purpose Uses (D-1), *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. This use requires a Board permit from the Board of Land and Natural Resources, who has the final authority to grant, modify, or deny any permit.*

Thank you for the opportunity to provide information and comments on this proposed project. Please consider OCCL a resource for your organization should you have any questions or concerns about coastal management related to this project or elsewhere. We can be reached at (808) 587-0377.

c: BLNR Chairperson
DLNR First Deputy
County Parks Director
Rachel Adams (Parsons Brinckerhoff)
Meesa Otani (FHWA)

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
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DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DLNR:OCCL:.SL

Correspondence OA-15-170

MAY 28 2015

MEMORANDUM:

TO: Ford N. Fuchigami
Director of Transportation

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: Re: Conservation District and Coastal Lands Consultation for Kamehameha Highway Realignment, Vicinity of Laniakea Beach, Haleiwa, Oahu; Federal Aid Project No. NH-083-1(074)

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) has reviewed your request to share information and provide input on the proposed realignment of Kamehameha Highway at Laniakea Beach, Oahu. Specifically, you are requesting that OCCL provide information on regulatory requirements related to use of lands for either of two project alternatives, as well as any other input or concerns OCCL may have regarding the proposed projects.

The State of Hawaii Department of Transportation (HDOT) is planning to realign Kamehameha Highway in the vicinity of Lanikea Beach on the North Shore of Oahu. Kamehameha Highway is classified as a "Principal Arterial" because it provides the principle roadway access between the surrounding North Shore communities. Laniakea Beach is popular and highly visited due to its scenic beauty and natural resources including the beach, surf, and sea turtles that frequent the area and have become a popular tourist attraction. Chun's Reef, another popular beach and surfing site, is also within the project area.

The shoreline in the project area is characterized by carbonate sand beaches at Laniakea and Chun's Reef, which are separated by a basalt rock headland. Land use along the shoreline is residential except for a roughly 750-foot gap at Lanikea and 350-foot gap at Chun's Reef where the highway runs along the shoreline. The shoreline is backed by a gently sloping coastal plain that varies in width from about 500 to 1000 feet to a coastal bluff (pali). Landward of the existing highway, the project area consists of lightly-developed agricultural lands owned by Bishop Estate Trust, City and County of Honolulu (County), and others.

According to your letter, a 2003 HDOT report identified the project area as a priority site on Oahu due to shoreline erosion and high-wave overwash that threatens Kamehameha Highway. In response to undermining of the roadbed by shoreline erosion, boulders have been placed along the seaward shoulder of the highway at Laniakea (approximately 750 feet) and Chun's (approximately 350 feet). During periods of especially high surf, often several times each winter, the highway at Laniakea and Chun's is overtopped and must be temporarily closed. The frequency and severity of wave overtopping along the highway is likely to increase in the coming decades with predicted increasing sea level rise.

The intent of the proposed project is to improve reliability of the highway by reducing hazard vulnerability of Kamehameha Highway to coastal erosion, including addressing the potential for increased hazard vulnerability due to sea level rise over the coming decades. The proposed project is also intended to provide secondary benefits of relieving traffic congestion; reducing travel time through the area; improving emergency vehicle response time; improving public safety, parking, and beach access; and providing for all modes of transportation including bicycles and pedestrians. Your letter notes that the County plans to develop two parks within the project area.

A National Environmental Policy Act (NEPA) Environmental Assessment (EA) document will be prepared for the project. The scope of the project will continue to be developed as planning studies for the project progress further.

At this time, HDOT is proposing two "Project Alternative Alignments" for Kamehameha Highway at Laniakea. The alternatives resulted, in part, from community input and recommendations provided by a Task Force assembled by HDOT. The two preferred alternatives at this time are the "*Minor*" and "*More*" realignments. At this time, the HDOT is not including a "*Moderate*" realignment alternative as proposed by the Task Force.

The *Minor Realignment* alternative would realign Kamehameha Highway roughly 60 feet landward from its current location beginning at the Haleiwa side of Laniakea Stream to the Waimea side of Kawailoa Stream (near Ashley Road / Chun's Reef). The realigned highway would be elevated roughly 6 to 10 feet higher than the current highway on an earthen embankment to reduce vulnerability to wave overtopping and predicted sea level rise. In addition, an approximately 600-foot long revetment would be constructed where the highway fronts Laniakea Beach. The revetment would be constructed landward of the current shoreline to the degree possible, though some work seaward of the certified shoreline is likely to be necessary with this option. Under this alternative the planned County parks would remain on the landward side of the realigned highway.

The *More Realignment* alternative would realign Kamehameha Highway as much as 750 feet landward to connect with an existing road near the base of the pali from the Haleiwa side of Laniakea Stream to the Waimea side of Kawailoa Stream (near Ashley Road / Chun's Reef). This alternative would require some connecting roadways to provide access to properties along the existing highway. Under this alternative the planned County parks could be developed on the seaward side of the realigned highway.

In response to your request for OCCL's input on the regulatory requirements and permits that would be necessary from our office for either of the project alternatives, we offer the following comments and suggestions:

- For the *Minor Realignment* alternative, a Conservation District Use Permit (CDUP) and State Land Disposition would be required for project activities occurring seaward of the certified shoreline (e.g., revetment construction).

- Not enough information has been provided to determine what, if any permits would be required from DLNR for the *More Realignment* alternative. Your letter does not indicate what work, if any, may occur seaward of the certified shoreline with this alternative. Please provide more information on the proposed scope of work if you would like OCCL to make a determination on the permitting requirements for this alternative.

In response to your request for other input or concerns regarding the proposed project, OCCL offers the following comments and suggestions:

- OCCL recommends the *More Realignment* alternative as a preferred alternative to move the road out of the erosion and inundation hazard zone. It is our opinion that the *Minor Realignment* alternative does not sufficiently address the ongoing problems at Laniakea and Chun's. The OCCL has supported a more landward realignment of the highway in this area in previous correspondence to the County and HDOT (DLNR Ref. OA-05-63; September, 2004). It is clear that the existing highway and revetments are too close to the water and are impacting beach processes and shoreline public access and present significant maintenance burdens. Historical coastal erosion studies by the University of Hawaii (UH) indicate that the beach fronting the highway at Laniakea is presently retreating at a rate of approximately 0.5 feet per year[1]. As noted in your letter, the highway at Laniakea and Chun's is regularly overwashed during seasonal high surf events, occasionally resulting in road closures due to hazardous conditions. A more recent UH study indicates that, on average, shoreline recession will be twice the historical extrapolation by 2050 due to increasing sea level rise[2]. The frequency and severity of coastal inundation events can also be expected to increase with sea level rise in the coming decades. OCCL commends HDOT for their forethought in considering increasing hazards with sea level rise with this project.

- In addition to improving traffic flow through this principle arterial road, the *More Realignment* alternative will provide the following benefits:
  1) Address the existing hazards of coastal erosion and wave overwash;
  2) Address the threat of increasing hazards with projected sea level rise in the coming decades;
  3) Improve and conserve the public beach resources at Laniakea and Chun's for generations to come;
  4) Improve public access to this popular recreation and visitor site; and
  5) Beautify this unique stretch of North Shore coastline.

Thank you for the opportunity to provide information and comments on this proposed project. Please consider OCCL a resource for your organization should you have any questions or concerns about coastal management related to this project or elsewhere. We can be reached at (808) 587-0377.

c: BLNR Chairperson
DLNR First Deputy
City Parks Director
Mr. Dexter Eji (HDOT, PB)
Ms. Meesa Otani (FHWA)

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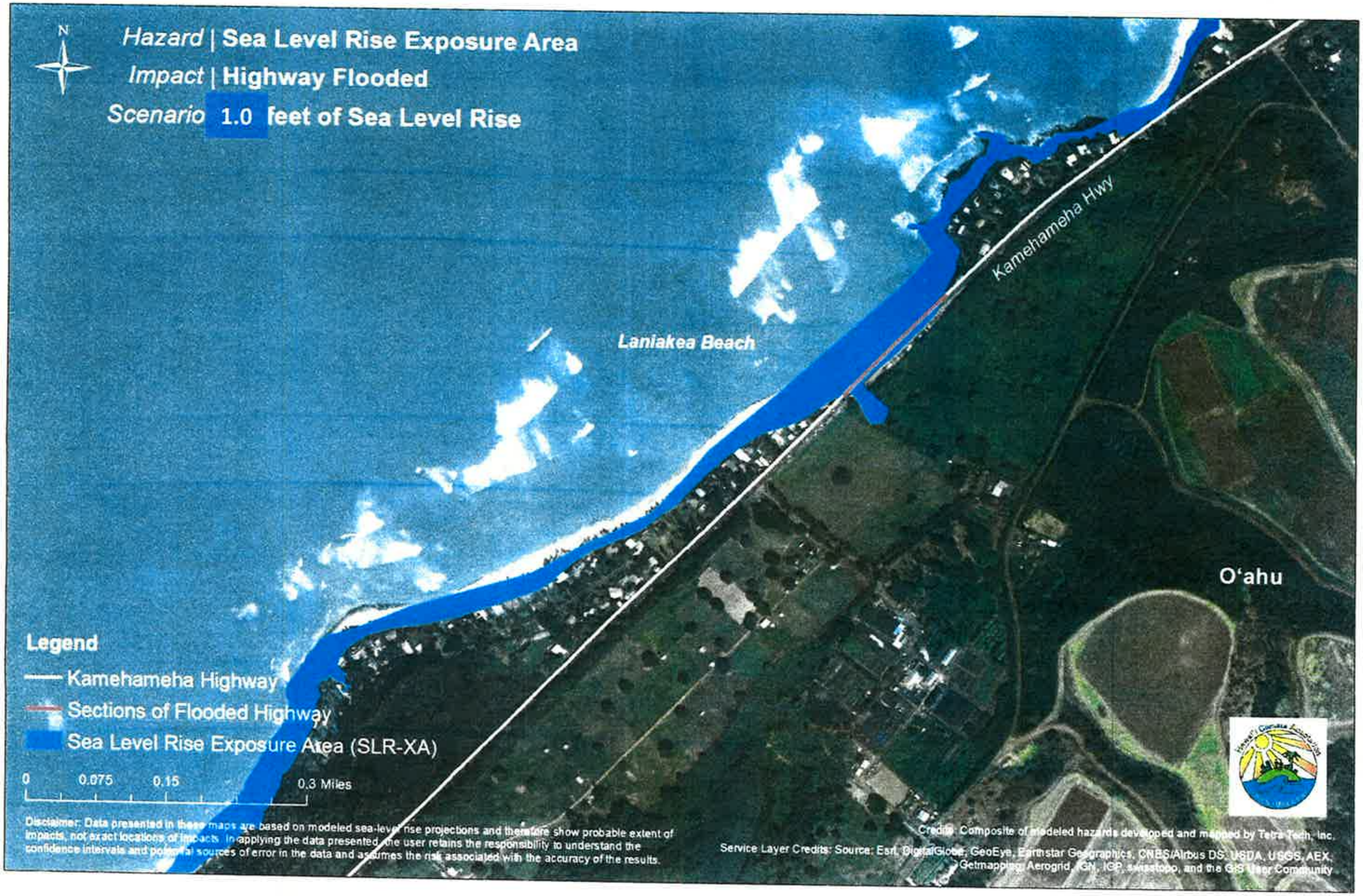
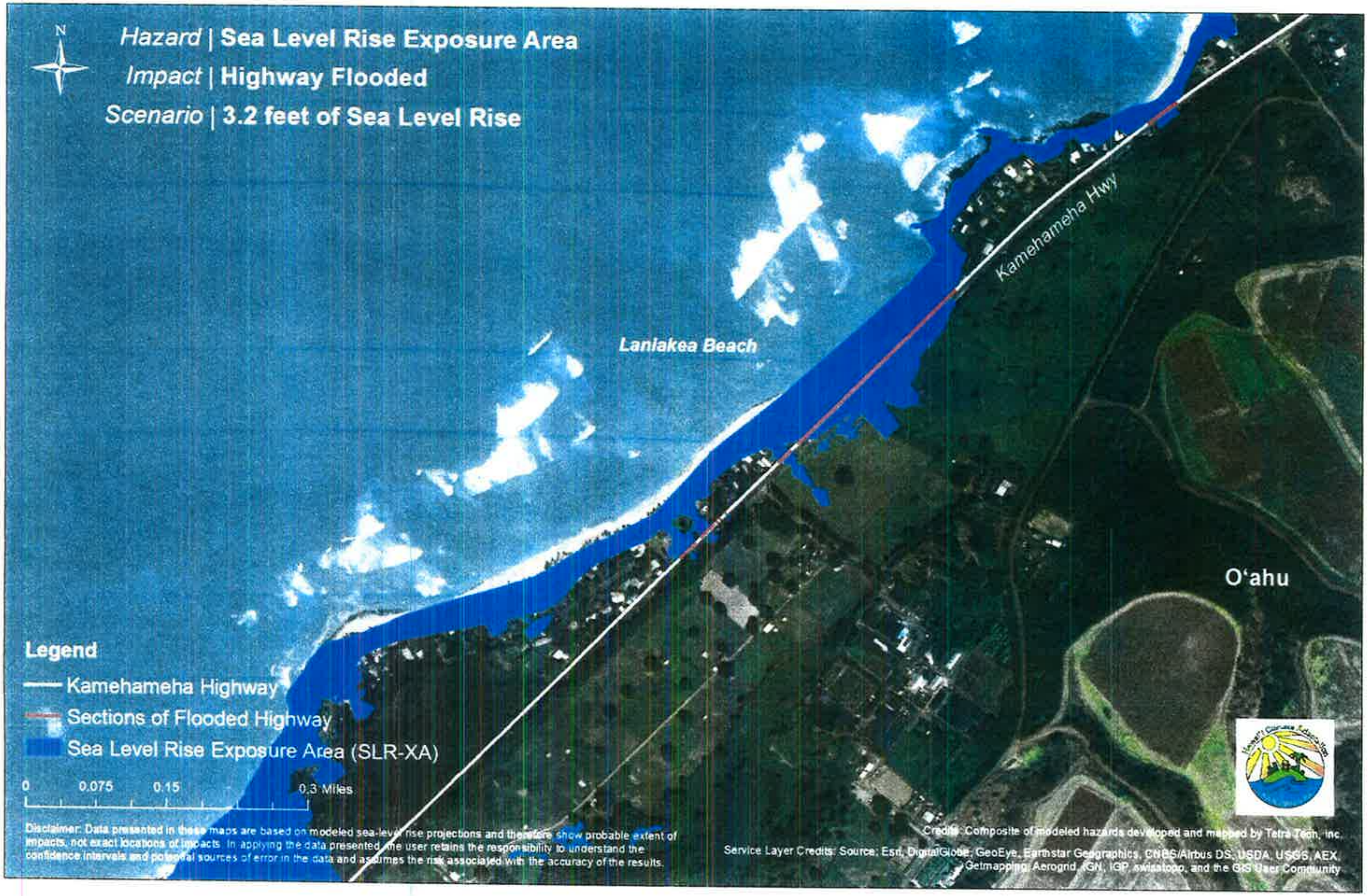
[1] ftp://soest.hawaii.edu/coastal/webftp/Oahu/posters/KawailoaSTsmoothTMKPoster72.jpg

[2] T.R. Anderson, et al. (2015) Doubling of coastal erosion under rising sea level by mid-century in Hawaii. Natural Hazards.

Enclosure: Sea Level Rise Exposure Area at 1.0 feet from the Draft Sea Level Rise Vulnerability and Adaptation Report



Enclosure: Sea Level Rise Exposure Area at 3.2 feet from the Draft Sea Level Rise Vulnerability and Adaptation Report



PROJECT NAME	Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach
DATE	08 October 2019
TIME	9:30 a.m. – 10:30 a.m. HST
VENUE	Fasi Municipal Building, 7th Floor
SUBJECT	Project Updates and Next Steps
CLIENT	HDOT
PRESENT	DLNR/OCCL: Sam Lemmo DPP: Kathy Sokugawa, Liz Krueger, Katia Balassiano HDOT: Ken Tatsuguchi, Brian Tyau, Genevieve Sullivan WSP: Dexter Eji, Rachel Adams, Malie McClellan

DISCUSSION

1) **BACKGROUND AND HDOT'S PREVIOUS PROJECT**
   - Purpose and Need
     - Project was originally being designed to address the effects of shoreline erosion at Laniakea Beach and Chun's Reef and would have shifted the highway much further mauka.
     - HDOT selected the "most" alternative (the realignment alternative that shifts Kamehameha Highway furthest mauka), out of roughly 14 different alternatives.
     - HDOT is now working as quickly as possible to address immediate pedestrian safety concerns along Kamehameha Highway fronting Laniakea Beach only.
     - Safety is now the top priority with congestion, shoreline erosion, and other concerns as secondary objectives.
   - Original Design
     - Too costly.
     - Too distant in time. A key cultural resource, Kahokuwelowelo, a wayfinding heiau that KSBE actively uses as an educational resource and PVS uses to train navigators, would be affected (noise, light pollution, viewplane from the heiau to the ocean/horizon).
       - This may be one of only two of this type of resource on Oahu.
     - HDOT was in the midst of working through these cultural impact issues when the pedestrian accident occurred.
   - The "Quinlan Alternative" (black wiggle line near Proposed City Park).
     - This was an alternative that was proposed during early planning, and seems similar to what HDOT is now designing, but it does not work.

    - The existing design speed of Kamehameha Highway is 40 mph. Curves in this design would require the design speed to be reduced to 15-20 mph. This would create an abrupt speed change scenario, particularly for those unfamiliar with the dynamics of the highway layout.

2) **NEW PROJECT'S BUILD ALTERNATIVE/DESIGN ELEMENTS**
- HDOT retained previous input on design elements from earlier agency coordination regarding this project and attempted to incorporate into the new Build Alternative design.
- Project is no longer NEPA/HEPA. State funds only, so now only HEPA applies.
- EA rather than EIS-level document is anticipated.
- New design proposes:
    - The roadway will be a 40' wide corridor adjacent to HDOT's right-of-way in some areas.
    - Two lanes with five-foot-wide shoulders that would be shifted just outside HDOT's existing right-of-way.
    - Roadway would be raised three feet higher than its existing elevation to minimize impacts of wave inundation during abnormal periods of high surf or king tides. This would be achieved with a stone (ungrouted revetment).
        - OCCL noted that this is not the preferred approach – any installation of rock, cement, or bulkhead structure would be considered a hardening of the shoreline.
        - OCCL considered this approach overly cautious, and more for the 1-5% chance events rather than the norm.
        - HDOT to re-evaluate this aspect of the design – intent would be to prevent water washing up over the proposed highway, but also understand that the design needs to be considerate of the regulations that the project is working within.
    - Roadway would be sloped, with the makai side slightly higher than mauka edge to direct stormwater runoff mauka, which is vegetated and can better accommodate water runoff.
    - Guardrails would be installed on the mauka edge for entire length of the shifted roadway to prevent parking. For the makai-side, guardrails would be placed in the areas fronting the beach itself. The current design has an opening near Pohaku Loa Way.
- HDOT will be evaluating the treatment for the existing portion of Kamehameha Highway that will be "abandoned":
    - Community input and consultation efforts will feed into what approach is taken (leave in place, renaturalize, bike lanes, etc.).
    - Pohaku Loa Way is designed to become a dead end, which could allow for the removal of asphalt along portions of Kamehameha Highway.
    - DPP explained that they've seen instances where shoreline neglect created a "private beach" that people can only access as pedestrians, or the public doesn't feel comfortable accessing. DPP cautioned that HDOT doesn't create a design that has a similar effect.
    - Restriction of parking that the public has become accustomed to could lead to frustration, and it has been ruled that the removal of parking can be interpreted as removing access.
- DPP and OCCL asked whether HDOT plans to install or create parking options:
    - HDOT explained that pedestrian safety is HDOT's focus. Parking is not authorized along HDOT's roadway facilities, but vehicles would be able to park as "de facto" parking on the makai side, just as they now do on the mauka side.
    - Reviewing HDOT's previously proposed shoreline certification line and proposed design, DPP indicated that placing parking in water is not consistent with the goals and objectives of the SMA and SSV shoreline management.

3) **REGULATORY COMPLIANCE**

- **Shoreline Certification**: Barriers have been removed. HDOT is in the process of re-surveying. Note: Shoreline Certification Process and HEPA will be running concurrently.
- **SMA/SSV:** DPP advised that the shoreline certification be completed before having discussions on regulatory expectations. Moving forward, the project should continue to ensure that application materials are complete and appropriate.
- **Conservation District Use Permit:** Revetment design represents a significant modification that would likely trigger a Board Review rather than Departmental Permit.
- Both agencies empathized with the challenges created by straddling the SMA and Conservation District. OCCL and DPP noted that no official decisions can be made by their offices until the project has a Certified Shoreline.

4) **OTHER ITEMS**

- Guardrail/Chain Link Fence Alternative
  - DPP and OCCL indicated a preference for this alternative as a short-term solution over shifting the roadway. DPP cited that it is more consistent with the objectives of Coastal Zone Management Policies rather than the roadway shift alternative because it does not place vehicle parking in the coastal waters.
  - When asked whether the guardrail meets the definition of development under 205A for SMA and SSV, DPP indicated that it is not relevant because they do not have jurisdiction makai of the shoreline.
- DPP asked whether the Hawaii Tourism Authority (HTA) had been consulted and/or asked to take their tour buses to Haleiwa Beach Park and other locations where turtles can be seen with plenty of parking. HDOT explained that outreach had been conducted when the issue was first discovered, but tour operators slowly reverted back. HDOT plans to meet with HTA once again.
- Status of Litigation: DPP asked whether litigation was still pending. HDOT thought that the order was the judge's finding and conclusions, and that there was nothing further pending. HDOT to verify.

Next Steps:

HDOT:

- Submit revised Shoreline Certification Application.
- Verify status of the litigation, whether there is any further action or decisions being made.
- HDOT to request another group meeting to discuss the project further after the shoreline has been surveyed and design discussions have been considered.

MEETING SUMMARY

KAMEHAMEHA HIGHWAY PEDESTRIAN SAFETY PROJECT

Subject/Purpose: Coordinate permit requirements/expectations with the City and County of Honolulu's Department of Planning and Permitting (DPP) and Department of Land and Natural Resources' Office of Conservation and Coastal Lands (OCCL) after publication of the Draft EA

Date: October 5, 2021 **Time:** 10:00 a.m.

Place: Microsoft Teams

Attendees: Kimberly Mills (OCCL), Lena Phomsouvanh (DPP); Liz Krueger (DPP); Katia Balassiano (DPP), Mario Siu-Li, (City Subdivision Branch)), Ken Tatsuguchi (DOT), Brian Tyau (DOT), Kevin Kasamoto (DOT) Rachel Adams (WSP), Jan Reichelderfer (WSP) and Dexter Eji (WSP)

Introductions and Project Background

- HDOT requested a meeting with DPP and OCCL together because both agencies have jurisdiction over the project area. Last meeting was two years ago prior to the Shoreline Survey (July 2020). Since then, meetings have been held with adjacent homeowners to determine and minimize impacts to their properties.
- HDOT determined that a major realignment would take too long to build and have too many impacts. Project needs to be implemented quickly to address pedestrian safety. Making the highway more resilient to climate change is a secondary purpose. The project is considered an interim solution for climate change/global sea level rise.

Proposed Design

- HDOT intends to retain ownership both the existing Kamehameha Highway right-of-way, as well as the realigned area, as shown in the typical section at this time. The new parking area would be a dirt, open space, not a formal paved area, but may be modified in the future by the appropriate City or State agency.

- DPP expressed concern that the City and County of Honolulu (City) or whoever develops that parking will have to go through all the compliance issues a 2nd time. DPP commented that this should have been a comprehensive solution. HDOT explained that their focus is transportation, parking lots and beach amenities are outside their jurisdiction. City's Department of Parks and Recreation (DPR) has been consulted several times during project development. The design is intended to accommodate the DPR's needs should they proceed with developing beach support amenities. The EA shows about 90 cars, but the area will not have lines to designate parking stalls so fewer would be accommodated. With informal or non-designated parking, the number of cars would be similar to existing accommodations.

- DPP expressed concern for parking on areas that have been identified as the shoreline/makai of the shoreline. Oils from cars may get on the ground in the parking area and be washed into the ocean. HDOT explained that the proposed project would move the parking area further away from the shoreline. This would lessen impacts to the coastal resources while maintaining access. HDOT acknowledged that the project does increase the amount of impervious surface because of the refuge lane but the plan is to remove and revegetate one lane of the existing highway.

  HDOT has permanent BMP requirements to handle stormwater that will need to be met, which should also satisfy City requirements.

- OCCL noted that the Sea Level Rise viewer shows the project area inundated by 3.2 feet of sea level rise in the next 30-50 years. Ken reiterated that this is an interim solution and HDOT has a limited amount of funding to divide between many projects. The current design fully addresses pedestrian safety, while allowing the roadway to operate for another 30-50 years.

- OCCL expressed concern for the rock revetment shown in the typical section. Revetment would affect adjacent properties and may influence sand movement, causing beach loss. OCCL discourages the hardening of the shoreline. Rachel explained that no new revetment is proposed; the project would only provide maintenance for the existing structure.

- HDOT and OCCL discussed plans for the portion of the existing Kamehameha Highway that the project intends to naturalize. OCCL generally advises beach nourishment when naturalizing the shoreline, but HDOT is concerned that because the area is behind a revetment, vegetation may be more desirable for stabilization and to address erosion concerns. OCCL advised that regardless of which route HDOT takes, HDOT will need a budgeted long-term maintenance plan. HDOT agreed.

Office of Conservation and Coastal Lands Regulatory Expectations

HDOT and OCCL discussed jurisdiction makai of the certified shoreline. Ken described the transportation facility as encompassing the right-of-way, which includes the pavement structure, as well as the utilities, roadway shoulders, etc. OCCL acknowledged that as long as the pavement is there, per Chapter 264 of the Hawaii Revised Statutes, her understanding is that HDOT retains jurisdiction. However, OCCL questioned whether in those areas where there is no pavement or the shoreline has eroded the roadway, whether that land is instead considered unencumbered and under the jurisdiction of OCCL. OCCL advised that HDOT consult with the Attorney General's office (AG) on this question, as well as whether the shared use path would still be considered part of the transportation facility under HDOT jurisdiction or is a non-conforming use. OCCL defers to the AG opinion. The appropriate approval process will be determined once the AG has reviewed. HDOT to follow-up with OCCL.

Department of Planning and Permitting's SMA Major Requirements

- WSP asked whether the DPP comments on the Draft EA were standard or specific to the project. DPP indicated they are a combination of both. WSP stated that they would use them as a checklist to ensure that the Final EA addresses them.

- HDOT asked if the shoreline will need to be re-certified in order to submit the SMA and SSV. The shoreline in the project area was dated July 30, 2020. HDOT plans to submit the application late December or January. Liz indicated that the SMA and SSV requires the certified shoreline. Liz pulled up DPP's Administrative Rules, and cited §13-4(b)(2) where an application for a government or approval has been submitted with a valid certified shoreline survey, the director may allow the certified shoreline to be used for the purposes of processing the application for up to 2 years. The EA can be considered the beginning of the application for a government project.

- DPP advised that HDOT should reach out to City Councilmembers and emphasized public involvement.

- The SMA process was recently amended to include a presentation to the Neighborhood Board (NB), which requires notices to abutting landowners. HDOT indicated that the project was presented to the NB last week. HDOT had intended to address their comments in the Final EA. Liz advised that the comments would also need to be presented and addressed in the SMA Major application. She suggested contacting the NB to see if they'd like another presentation explaining that there had been several meetings with the adjoining neighbors. If the NB says a presentation is not needed or does not respond in 60 days, the requirement is met.

- HDOT asked Mario about the subdivision application requirements and timing. Mario explained that it comes after the SMA and SSV because the subdivision application has strict deadlines and delays would derail the process. The subdivision process requires a certified shoreline. Mario also verifies that the SMA and SSV permits have been obtained. In addition, the subdivision application verifies conformance with the NFIP. Mario indicated that HDOT's documentation of conformance with the NFIP is enough for the subdivision application's purposes.

Other Issues Discussed

- HDOT asked OCCL and DPP's opinion on whether the temporary blocking of parking consistent with CZM? HDOT has received comments on the Draft EA regarding this issue. DPP acknowledged that sometimes it is necessary for safety during construction, if it cannot be avoided or mitigated then it should be disclosed in the EA and in the SMA application.

- The group lamented the number of agencies and the overlapping jurisdictions for these types of projects and the time it takes to coordinate. DOT will soon have many more projects like this, and it would streamline the process if an agency was available to holistically review and permit projects to make infrastructure resilient.

Action Items:

1. HDOT to request AG review on Conservation District jurisdiction.
2. HDOT to coordinate with the NB regarding the need for a second presentation. (Follow-up Note: Per October 6, 2021 Email from Kathleen Pahinui (North Shore NB Chairperson) to HDOT, the September 28, 2021 presentation is sufficient.)

Appendix

B

Traffic Evaluation

TECHNICAL REPORT

Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Traffic Evaluation

Haleiwa, Island of Oahu, Hawaii

November 2021

Prepared for:
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Introduction

This traffic study has been initiated to support the Environmental Assessment (EA) for the Kamehameha Highway Pedestrian Safety Project in accordance with Hawaiʻi Revised Statutes (HRS) Chapter 343 due to the use of State funds and land. The purpose of this report is to analyze traffic impacts of the proposed improvements to Kamehameha Highway in the vicinity of Laniakea Beach on the island of Oahu.

This technical evaluation documents the evaluation of future traffic conditions for two alternatives on a realigned Kamehameha Highway for the projected build-out year of 2030 and the 2050 horizon year.

Project Description

Laniakea Beach is a popular tourist attraction on the North Shore of Oahu, located along Kamehameha Highway northeast of Haleiwa. Sight-seers visit the beach to observe sea turtles basking in the sun on the beach. The beach is also a popular surfing spot. Beach goers generally use the open area mauka of the beach across Kamehameha Highway to park, which creates a safety issue as they cross the highway to reach the beach.

Traffic congestion is also an issue at Laniakea Beach. Vehicular turning movements to and from the Kamehameha Highway from the open area mauka of the highway, combined with the frequent shuttles and the random pedestrian crossing further complicate traffic operation and safety on this segment of Kamehameha Highway. Waimea-bound traffic flow can experience high delays with queuing extending past the Kamehameha Highway/Joseph P. Leong Highway intersection on weekend afternoons.

In December 2013, the Hawaii Department of Transportation (HDOT) installed a barrier to prohibit parking on the mauka side of Kamehameha Highway to help address the traffic congestion issue. This was only intended to be a short-term fix and with the realignment of Kamehameha Highway further inland proposed as a long-term solution. The barrier was effective at reducing congestion on Kamehameha Highway but it was removed in August 2015 due to a legal challenge involving beach access. In August 2019 a pedestrian was hit while crossing the highway and the HDOT began moving forward with the Kamehameha Highway Pedestrian Safety Project.

HDOT is now proposing to realign the Kamehameha Highway near Laniakea Beach (**Figure 1**) to improve pedestrian safety. The proposed project will also work to improve the public highway system in terms of congestion, mobility, and reliability, while providing local access to this public beach and private property.

The alternatives are described as:

- No-Build Alternative – No modifications would be made to Kamehameha Highway.
- No Build Settlement Alternative – Regarding the No Build Settlement, the way this alternative would operate is similar to how the existing situation was modeled, but with more defined access points. The No Build Settlement alternative would consist of two intersections while the No Build alternative was modeled as three intersections. Generally speaking, the results from modeling for the No Build alternative can be considered slightly more conservative because it assumed interruptions in traffic in more locations than the No Build Settlement alternative.
- Transportation Systems Management (TSM) Alternative – The TSM alternative would consist of constructing a guard rail on the mauka side of Kamehameha Highway within its right-of-way fronting Laniakea Beach. The guardrail would be an estimated 1,000 linear feet and would enforce the no parking condition. This alternative may also be implemented during the construction of one of the Build Alternatives.
- “Pedestrian Shift” Alternative – The “Pedestrian Shift” Alternative would consist of generally shifting Kamehameha Highway roughly 80’ mauka from its current alignment as shown in **Figure 2**. The modification would be roughly 0.5 miles and include a median refuge lane. The existing Kamehameha Highway would be converted to a 16-foot wide shared use path for pedestrians and bicycles. With the beach and an unsanctioned parking area both on the same side of Kamehameha Highway, no pedestrian crossings are anticipated. Residential driveways would be extended as appropriate and Pohaku Loa Way would be gated on the beach side.
- “Most Realignment” Alternative – The “Most Realignment” Alternative generally consists of realigning Kamehameha Highway mauka as far as feasible on the Haleiwa side of Laniakea Bridge to the Waimea side of Ashley Road, a distance of roughly 0.8 miles, as shown in **Figure 3**. As part of the alternative, two new roads would be constructed which would connect the realigned Kamehameha Highway to the existing alignment and affected residential properties, which would function as a shared use path for pedestrians and bicycles. Pohaku Loa Way would be gated on the beach side.

Existing Conditions

Within the study area, Kamehameha Highway is a two-lane, principal arterial. Despite being classified as such, the roadway's mobility can be compromised by beach-related vehicle and pedestrian traffic, most notably at Laniakea Beach. In addition, residential direct driveway access is provided on one or both sides of Kamehameha Highway for most of the area between Haleiwa and Waimea. The posted speed limit in the vicinity of Laniakea Beach is 35 miles per hour.

Kamehameha Highway is served by two bus routes at Laniakea Beach: Route 55 – North Shore-Kaneohe (approximately 45-minute headway during commuter peaks) and Route 88A – North Shore Express (2 buses per day). Only standard sized buses traverse Kamehameha Highway. No extended buses are used.

In December 2013, an approximately 1,000-foot long concrete barrier was installed mauka of Kamehameha Highway by HDOT. The purpose of the barrier was to improve traffic safety by reducing pedestrian-vehicle conflicts and to improve Kamehameha Highway traffic delays. The installation of the barrier improved travel times by 10-15 minutes in the Waimea-bound direction on Saturday afternoons. When the barriers were removed, Saturday travel times and delays returned to pre-barrier conditions.

2012 HDOT traffic counts at Chun's Reef (roughly 0.4mile northeast of the Laniakea Beach) were used to establish a baseline for Kamehameha Highway through traffic. An average of two days of 24-hour traffic data in March 2012 was used. The existing Average Daily Traffic (ADT) is between 15,000 and 16,000 vehicles per day. The heavy vehicle percentage is 2.37%. Historical volumes through 2015 were examined and 2020 weekday AM peak hour volumes were estimated. Supplementary January 2020 weekday PM and Saturday counts were conducted to provide the most recent counts for critical peak periods on Kamehameha Highway.

Pedestrian and traffic data was collected on Thursday, January 16, 2020 and Saturday, January 18, 2020. The weekday PM peak hour was 4:00 PM-5:00 PM and the Saturday peak hour was 11:30 AM-12:30 PM. Existing peak hour traffic volumes are shown in **Table 1** and **Figure 4.** Left and right turns into the open area per hour during the weekday PM and Saturday afternoons are shown in **Figure 5**. Turns during the weekday PM and Saturday peak hours are shown in **Table 2**. Hourly pedestrian crossings are shown in **Figure 6**. Pedestrian crossings weekday PM and Saturday peak hours are shown in **Table 3**.

Table 1 Existing Weekday and Saturday PM Peak Hour Traffic

	East Bound (EB)	West Bound (WB)	Total
Weekday PM	742	710	1452
Saturday	745	666	1411

Vehicles per hour

Table 2 Existing Weekday and Saturday PM Parking-Related Turns during Peak Hour Traffic

	In			Out		
	Right	Left	Total	Left	Right	Total
Weekday PM	30	16	46	26	21	47
Saturday	53	9	62	19	51	70

Vehicles per hour

Table 3 Existing Weekday and Saturday PM Pedestrian Crossing Volume during Peak Hour Traffic

	Crossings
Weekday PM	194
Saturday	304

Pedestrians per hour

As shown in **Table 1**, peak hour traffic volumes at Laniakea Bridge are fairly comparable on weekdays and Saturdays. However, the traffic demand is not being processed due to the delays associated with Laniakea Beach. **Tables 2 and 3** show the increase in beach activity on the weekend. While **Table 3** shows the observed pedestrian crossings during the traffic peak, the hourly pedestrian crossing peaks were 242 pedestrian crossings per hour during the weekday afternoon (between 2:00 PM and 3:00 PM) and 338 crossings per hour during the Saturday afternoon (between 11:45 AM and 12:45 PM).

Travel time runs were conducted between Haleiwa (Kamehameha Highway/Joseph P. Leong Highway intersection, west of Haleiwa) and Waimea (Waimea Valley Road intersection), a distance of approximately 5.6 miles. The weekday afternoon travel time runs were conducted on Wednesday, January 22, 2020 between 12:00 PM and 5:00 PM and the Saturday afternoon travel time runs were conducted on Saturday, January 25, 2020 between 11:00 AM and 5:00 PM. Travel time runs would typically take 9-10 minutes during free-flow conditions with minimal beach-related delay. The weekday and Saturday afternoon travel times are shown in **Figures 7 and 8.**

Waimea-bound weekday afternoon conditions are generally free flow until the Kawailoa Ranch area, where beach-related slowdown is observed. A travel time that would normally be 10 minutes with no Laniakea Beach slowdown would take 11-12 minutes due to about 1-2 minutes of additional delay caused by the beach. **Table 4** shows how much additional delay was added in the Waimea-bound direction by comparing each travel time run to the fastest run of the day at a point just east of Laniakea Beach. This helped to show how much delay was directly caused by beach-related traffic. As shown, an additional 3-5 minutes of delay was observed throughout the afternoon on weekdays.

Table 4 Existing Weekday Waimea-bound Laniakea Beach Delay

Time	Laniakea Delay (min)
12:03 PM	0:04:25
12:32 PM	0:03:33
1:16 PM	Free-Flow
2:00 PM	0:02:52
2:44 PM	0:02:47
3:34 PM	0:05:29
4:10 PM	0:03:19

As shown in **Figure 7**, on significant spike in travel time was observed during a travel time starting at 2:44 PM. It is unknown what caused this additional congestion on Kamehameha Highway but it should be noted that it originated downstream of Waimea Bay, caused by an event or incident occurring further east and was therefore not associated with Laniakea Beach. The subsequent 3:34 PM Waimea-bound travel time run was also impacted by the residual queue. Haleiwa-bound runs were generally free flow, although congestion began to build up in the vicinity of Chun's Reef before Laniakea Beach starting around 4:00 PM.

Saturday afternoon traffic conditions are consistent with weekday afternoon conditions in the Haleiwa-bound direction. Travel times were generally close to 11-12 minutes, increasing slightly in the late afternoon. As shown in **Figure 8**, Waimea-bound traffic began to queue up starting around 11:30 AM. Almost immediately, the back of queue started to approach the Kamehameha Highway/Joseph P. Leong Highway intersection east of Haleiwa and persisted throughout the afternoon, extending past the Waimea-bound “Welcome to Haleiwa” sign to around the Tsue’s Farm driveway. The longest travel time was 34 minutes at 2:01 PM. As shown in **Table 5** approximately 25 minutes of the delay was due to Laniakea Beach. This queue began to dissipate around 3:00 PM and was almost completely gone by 5:00 PM.

Table 5 Existing Saturday Waimea-bound Laniakea Beach Delay

Time	Laniakea Delay (min)
10:10 AM	Free-Flow
11:06 AM	0:00:49
11:40 AM	0:08:05
12:15 PM	0:17:08
1:04 PM	0:21:48
2:01 PM	0:24:58
3:01 PM	0:20:15
4:13 PM	0:07:40

<u>Existing Conditions Analysis Methodology</u>

2020 traffic data and historical Kamehameha Highway data were used to calibrate Synchro/Simtraffic, traffic simulation software, for existing conditions.

The existing conditions were analyzed using Synchro. The Arterial Level of Service (LOS) was obtained to measure regional mobility. Arterial LOS is based on travel speed, which, as defined by the Highway Capacity Manual (HCM), is based on the class of arterial and travel speed along the arterial. Arterial LOS analysis produces an arterial speed and travel time for the entire length of the arterial as well as between signalized intersections. For the purpose of this analysis, the following assumptions were made in order to model conditions at Laniakea Beach:

- The beach was analyzed as two signalized intersections. This was based on the observation that at most, two pedestrian groups or turning vehicles would interrupt traffic at a given time. Modeling the beach with a signalized intersection also helped to ensure that Arterial LOS would provide a node at the beach.
- The cycle length of these signals was based on the total number of peak hour crossing pedestrians divided by the average size of the crossing group (observed to be 3 pedestrians per group on average).

The parameters for the traffic signals at the beach nodes calibrated such that the Arterial LOS travel times that agreed with the existing January 2020 travel time runs. In the case of the Saturday travel time runs, SimTraffic was seeded for 1.5 hours to act as a “warm-up” for simulation to represent Saturday conditions and the queue that builds up during the mid-day hours. The SimTraffic Arterial LOS was compared with the Saturday peak conditions.

Year 2030 Conditions

2030 is the project’s proposed build year, when the project is expected to be completed. The No-Build condition would preserve the existing alignment and elevation of Kamehameha Highway. The existing parking conditions would be preserved along with the vehicular and pedestrian conflicts described in the existing conditions. The TSM Alternative would install guardrails on the mauka side of Kamehameha Highway, eliminating the parking area.

The “Pedestrian Shift” and “Most Realignment” Build Alternatives are shown in **Figure 2 and 3**. The “Pedestrian Shift” Alternative would shift the Kamehameha Highway alignment inland approximately 60 feet such that the existing parking area would on the same side of Kamehameha Highway as Laniakea Beach. The “Most Realignment” Alternative would shift the Kamehameha Highway alignment much further inland and utilize an existing cane haul road. The “Most Realignment” Alternative would prohibit all parking along Kamehameha Highway. In addition, two new intersections are proposed to provide access the beach and residential safely.

Year 2030 Conditions Analysis Methodology

2012 HDOT traffic volumes were used as a base for through traffic on Kamehameha Highway. Historical data on Kamehameha Highway northeast of Laniakea Beach showed a 1.14% annual growth rate between 2007 and 2012. Using the 2035 Oahu Metropolitan Planning Organization (OMPO) model as a reference, a 0.88% annual growth rate was obtained between the base year 2007 and 2035. Averaging the two, a 1.0% annual growth rate was obtained. Projected Year 2030 Kamehameha Highway through traffic volumes were obtained by applying the 1.0% growth rate to the 2012 traffic volumes. The 2013 Turtle Bay Resort Master Plan traffic impact analysis report by The Traffic Management Consultant was used to incorporate the anticipated impact of the Turtle Bay Resort expansion for future scenarios.

The projected 2030 traffic volumes for the No-Build, TSM, "Pedestrian Shift", and "Most Realignment" Alternatives are shown in **Figure 9**. The projected turning movements at Laniakea Beach were based off of existing conditions.

The four alternatives were analyzed using Synchro Arterial LOS analysis. Arterial LOS analysis produces an arterial speed and travel times. **Tables 6 and 7** show the projected travel times for the No-Build, TSM, "Pedestrian Shift" (with individual driveways and with a second option of combined driveways), and "Most Realignment" alternatives along with the existing condition calculated travel time for the Waimea-bound and Haleiwa-bound directions, respectively. Synchro capacity analysis contained within **Appendix B**.

Table 6 2030 Waimea-bound Projected Arterial Level of Service

		Weekday AM		Weekday PM		Saturday	
	Distance (mi)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)
Existing	5.61	9.5	35.4	9.7	34.6	13.0	26.0
No-Build	5.61	10.1	33.5	16.5	20.4	18.4	18.3
TSM	5.61	9.2	36.6	9.5	35.6	9.5	35.3
Ped Shift	5.62	9.3	36.1	9.8	34.5	10.0	33.9
Ped Shift 1 D/W	5.61	9.2	36.5	9.5	35.4	9.7	34.6
Most	5.65	9.3	36.5	9.6	35.4	9.8	34.6

Table 7 2030 Haleiwa-bound Projected Arterial Level of Service

		Weekday AM		Weekday PM		Saturday	
	Distance (mi)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)
Existing	5.61	9.7	34.8	9.9	34.2	10.5	32.1
No-Build	5.61	10.3	32.6	14.2	23.8	13.1	25.7
TSM	5.61	9.5	35.4	9.8	34.4	9.9	34.0
Ped Shift	5.62	9.7	34.8	10.1	33.3	10.2	32.9

Ped Shift 1 D/W	5.61	9.5	35.3	9.9	34.1	10.0	33.8
Most	5.65	9.6	35.3	9.9	34.1	10.0	33.8

The approximately 10-minute travel time represents near-free flow conditions with few interruptions. As shown in **Table 6 and 7**, travel time is projected to be roughly the same as existing during the AM peak hour. During the weekday PM and Saturday periods, the No-Build condition is projected to operate worse than all other alternatives, which are projected to operate similarly. Generally speaking, the TSM, "Pedestrian Shift", and "Most Realignment" Alternatives are projected to have almost identical travel times with less than one (1) minute separating the alternatives.

Year 2050 Conditions

2050 is the project's proposed horizon year. Projected Year 2050 Kamehameha Highway through traffic volumes were obtained by applying the 1.0% growth rate to the 2014 traffic volumes combined with projected traffic generated by Turtle Bay. Between 2030 and 2050, no new development is projected that would impact the study area intersections. The projected 2050 traffic volumes for the No-Build, TSM, "Pedestrian Shift", and "Most Realignment" Alternatives are shown in **Figure 10**. The projected turning movements at Laniakea Beach were based off of existing conditions.

Year 2030 Conditions Analysis Methodology

The four alternatives were analyzed using Synchro Arterial LOS analysis. Arterial LOS analysis produces an arterial speed and travel times. **Table 7** shows the projected travel times for the No-Build, TSM, "Pedestrian Shift" (with no driveway and with 1 driveway), and "Most Realignment" Alternatives along with the existing condition calculated travel time.

As shown in **Table 8 and 9**, travel time is projected to be roughly the same as existing during the AM peak hour. The TSM alternative has the fastest travel time due to completely eliminating beach-related trips as well as any vehicular turning movements or pedestrian crossings at the beach; however, it's still less than a minute faster than the Build Alternatives. The No-Build condition is projected to operate worse than all other alternatives during the Weekday PM and Saturday time periods, especially in comparison to the 2030 analysis year. The TSM, "Pedestrian Shift", and "Most Realignment" Alternatives all are projected to operate within one (1) minute of each other.

Table 8   2050 Waimea-bound Projected Arterial Level of Service

Waimea-bound	Distance (mi)	Weekday AM		Weekday PM		Saturday	
		Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)
Existing	5.61	9.5	35.4	9.7	34.6	13.0	26.0
No-Build	5.61	10.2	32.8	20.7	16.2	22.7	14.8
TSM	5.61	9.2	36.5	9.7	34.6	9.9	34.1
Ped Shift	5.62	9.4	35.9	10.2	33.1	10.8	31.1
Ped Shift 1 D/W	5.61	9.3	36.4	10.0	33.7	11.9	28.2
Most	5.65	9.3	36.4	10.0	33.8	12.0	28.2

Table 9   2050 Haleiwa-bound Projected Arterial Level of Service

Haleiwa-bound	Distance (mi)	Weekday AM		Weekday PM		Saturday	
		Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)	Travel Time (min)	Speed (mph)
Existing	5.61	9.7	34.8	9.9	34.2	10.5	32.1
No-Build	5.61	10.8	31.2	18.4	18.3	16.9	19.9
TSM	5.61	9.6	34.9	10.5	31.9	10.7	31.4
Ped Shift	5.62	9.9	34.0	11.1	30.4	11.3	30.0
Ped Shift 1 D/W	5.61	9.7	34.7	10.8	31.3	10.9	30.9
Most	5.65	9.8	34.7	10.8	31.3	11.0	30.9

Summary and Recommendations

The No-Build alternative is not recommended because existing traffic congestion issues are expected to persist, exacerbated by regional growth. Delays exceeding 30 minutes are expected. While the TSM Alternative provides the smoothest trip through the corridor with the fewest conflicts, it also entails removing most beach access as a tradeoff. Therefore, the Build Alternatives are preferable because they are projected to maintain/reduce travel times along the corridor while maintaining beach access.

The TSM Alternative has been proven effective as a short-term solution, improving Kamehameha Highway traffic flow through the area and can be implemented during construction. Realigning

Kamehameha Highway is a logical long term solution which will allow for the restoration of informal parking at Laniakea Beach while also allowing beach patrons to access the beach safely. From a traffic operations perspective, Kamehameha Highway through traffic will be able to pass through the area with fewer vehicular and pedestrian conflicts, improving mobility along the corridor.

The “Pedestrian Shift” Alternative improves safety by vastly reducing the need for pedestrians to cross Kamehameha Highway at Laniakea Beach. This alternative would prohibit all on-street parking and realign Kamehameha Highway mauka of the parking area, essentially eliminating pedestrian conflicts. It is projected to provide greater regional mobility while improving safety. The “Pedestrian Shift” Alternative will provide a median lane to allow vehicles to queue while waiting for gaps in Haleiwa-bound traffic and to act as a refuge lane for exiting traffic.

The “Most Realignment” Alternative also improves safety by shifting the Kamehameha Highway alignment further inland and removing on-street parking. A two-lane access road would provide access to the beach area. This alternative would prohibit all on-street parking, essentially eliminating pedestrian and vehicular conflicts. It is projected to provide greater regional mobility while improving safety.

Since travel times along both proposed Kamehameha Highway alignments are virtually identical, the recommended alignment comes down to safety. The “Most Realignment” Alternative completely removes pedestrians from Kamehameha Highway while also concentrating beach-related traffic at a stop-controlled tee-intersection. The choice between “Pedestrian Shift” Alternative and “Most Realignment” Alternative then becomes a decision to include weighing overall cost and ancillary benefits such as sea level rise and erosion control.

FIGURES

Vicinity Map

Figure
1

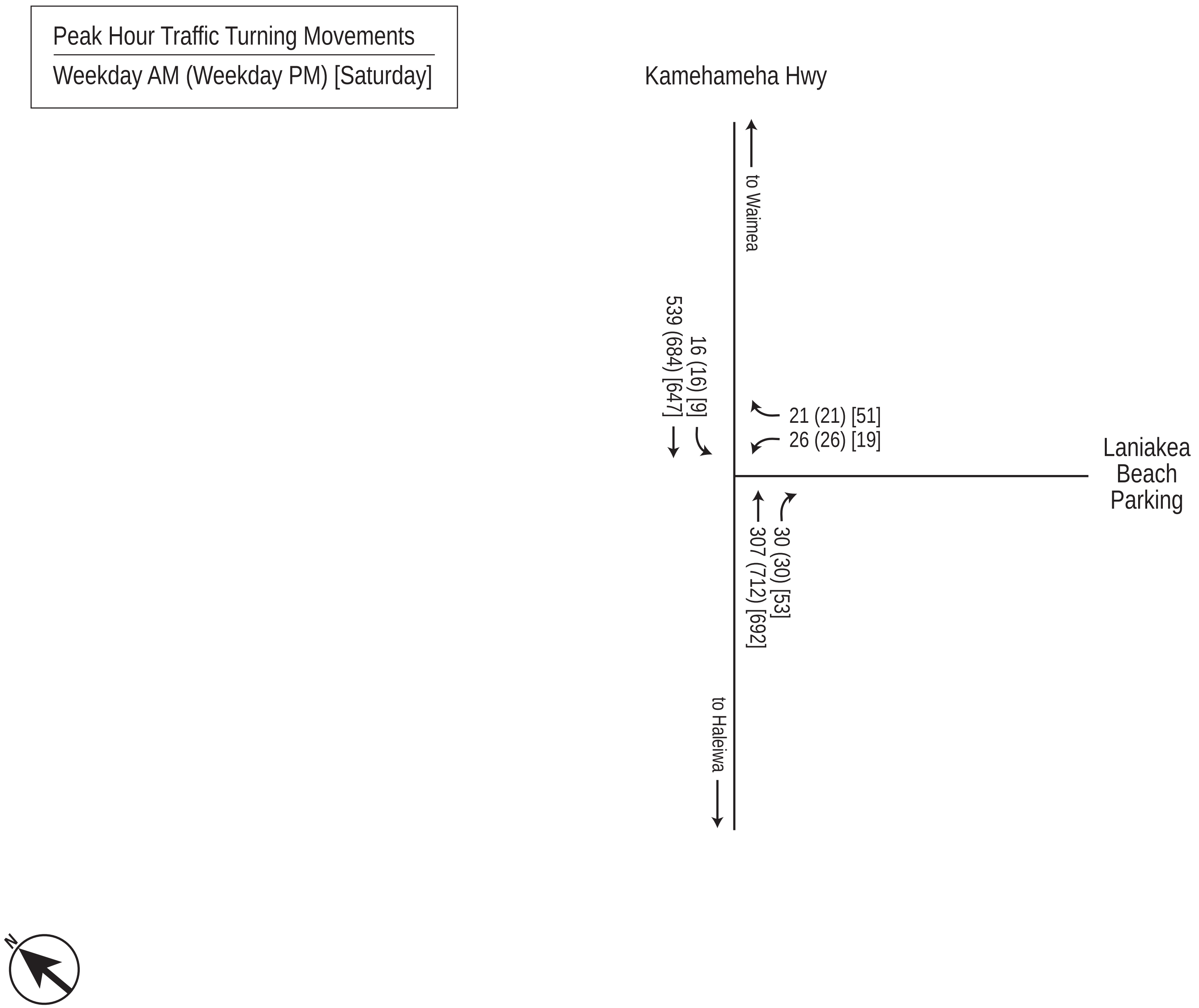
N

Pedestrian Shift Alternative

Figure
2

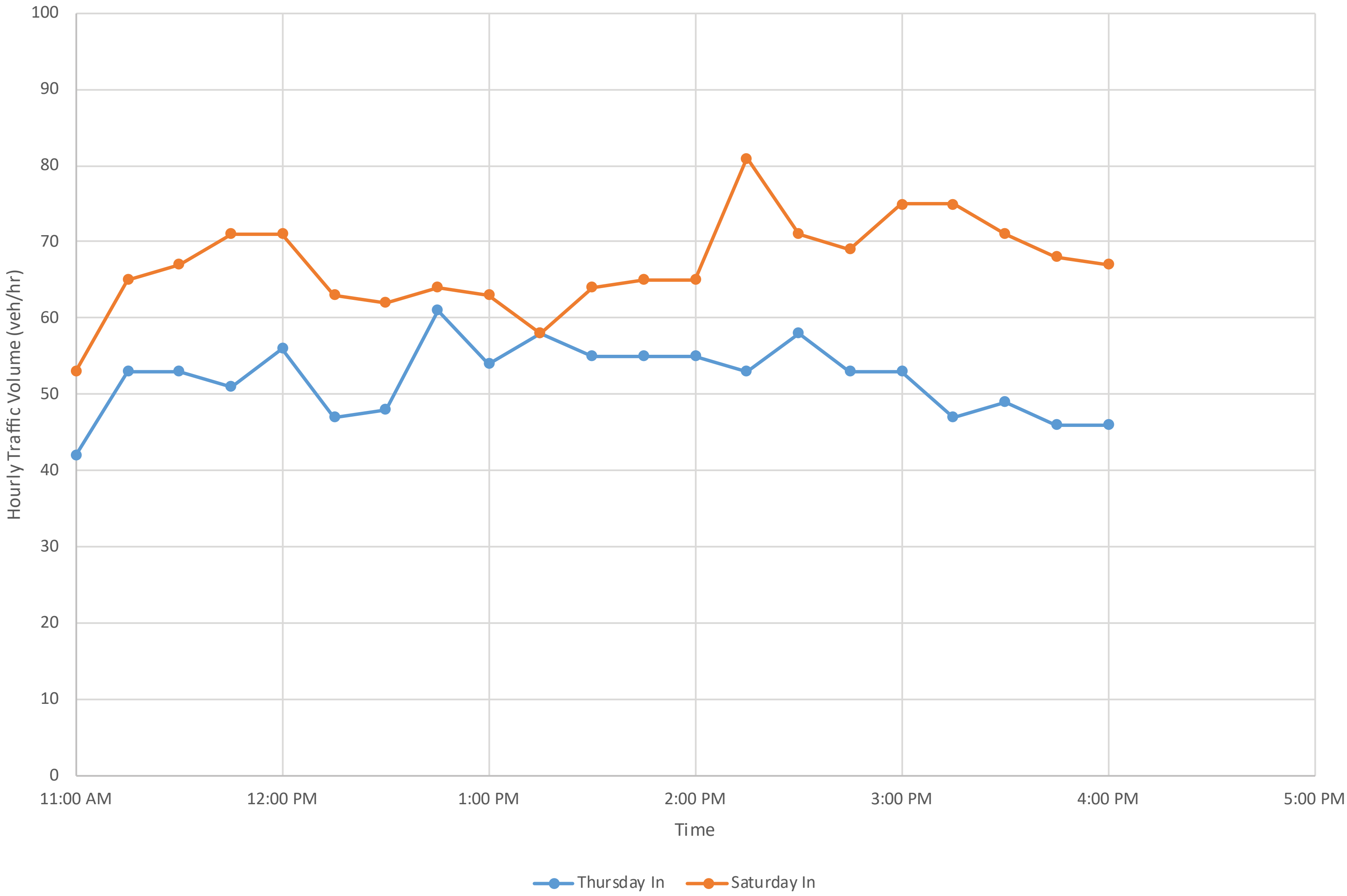
Most Alternative

Figure 3



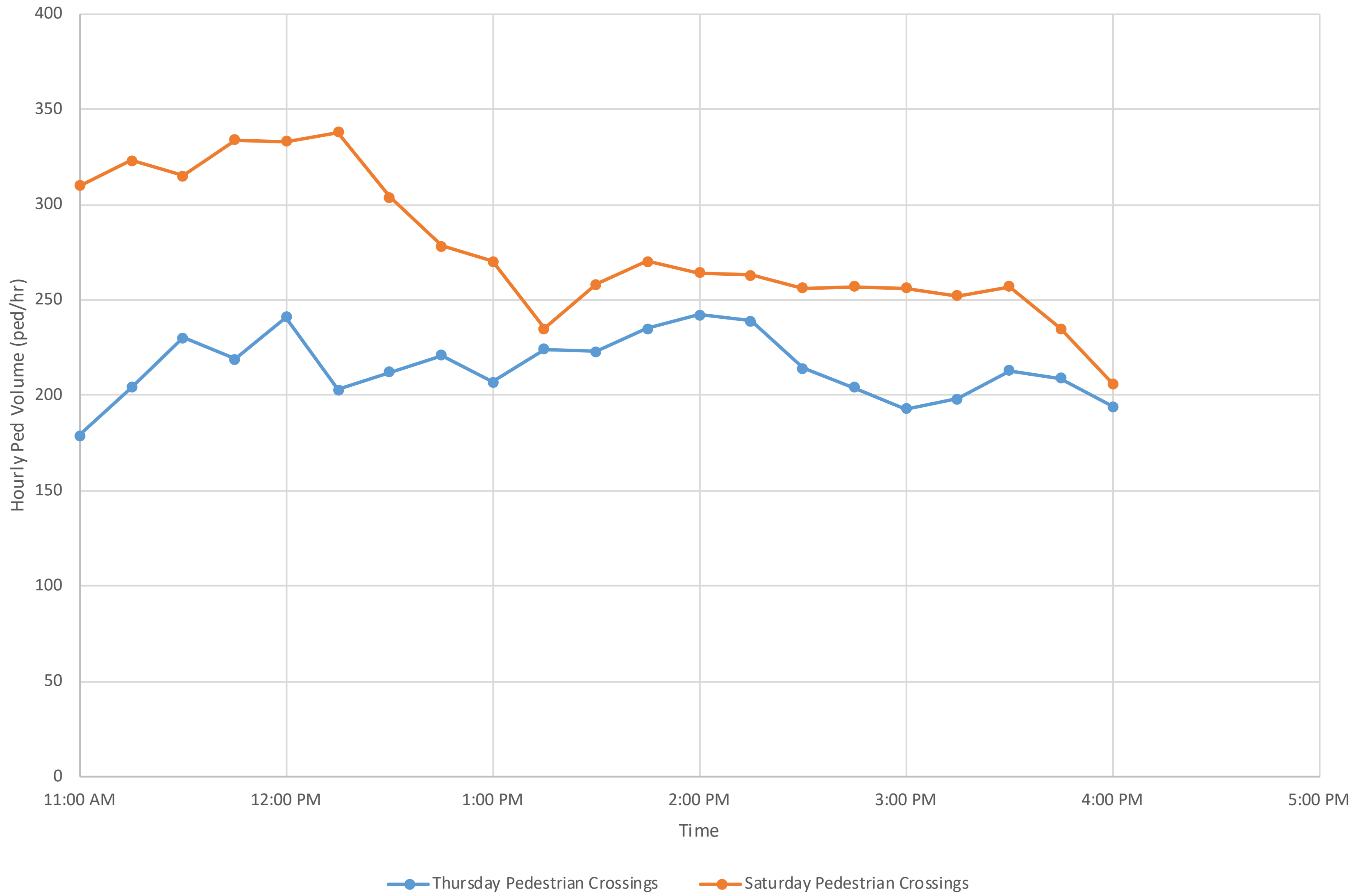
Existing 2020 Traffic Volumes

Figure 4



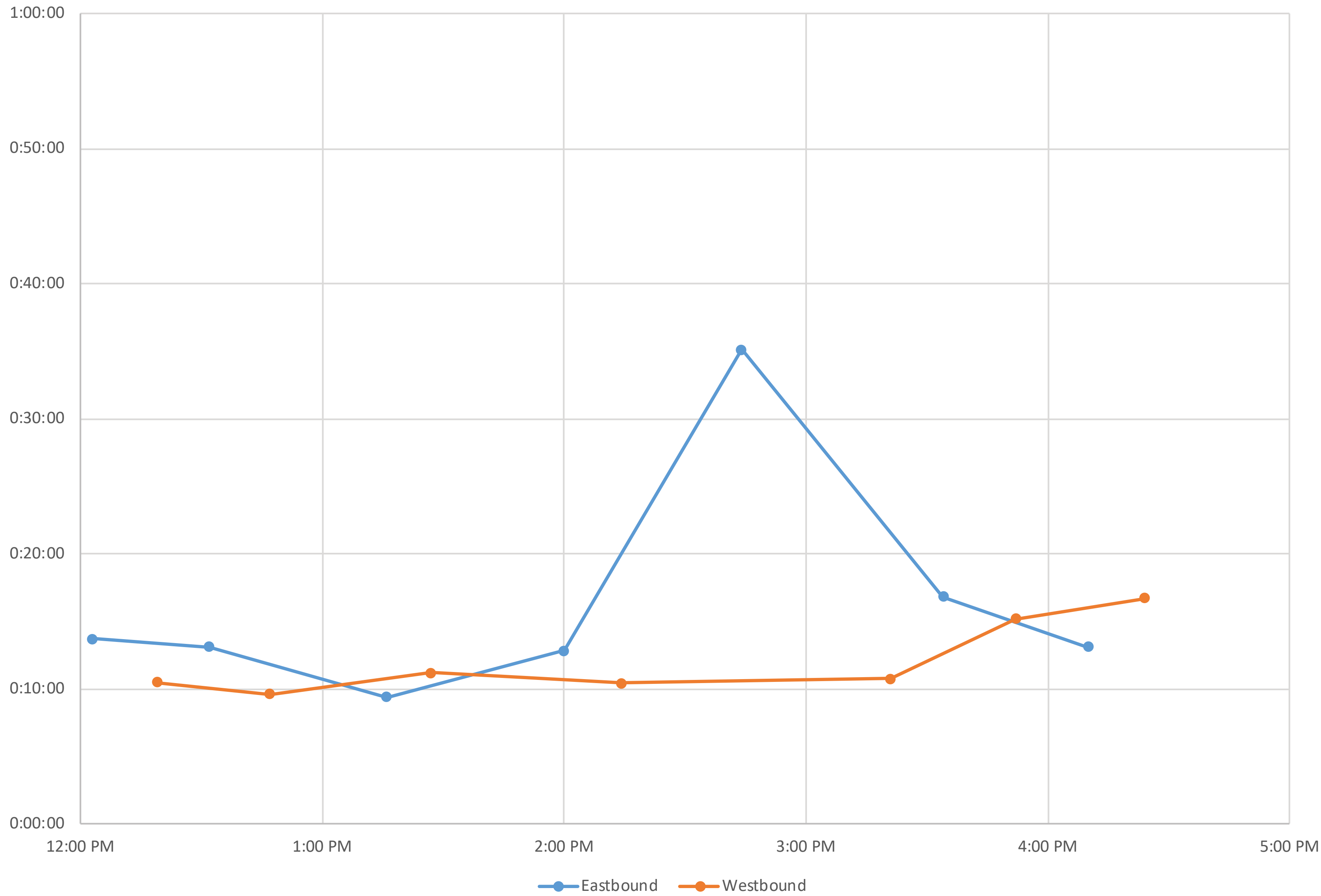
Existing Parking at Laniakea Beach

Figure
5



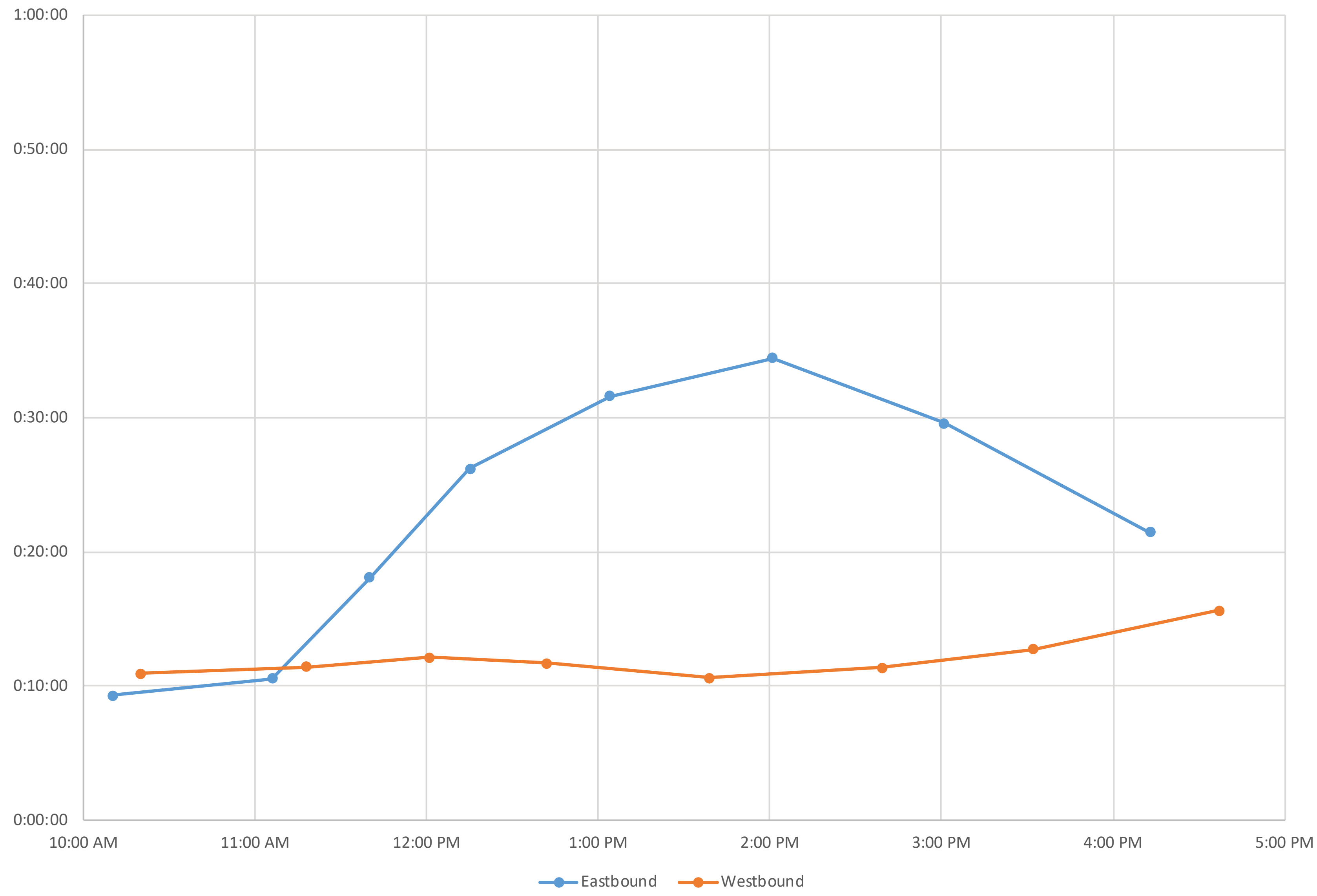
Existing Pedestrian Crossings at Laniakea Beach

Figure
6



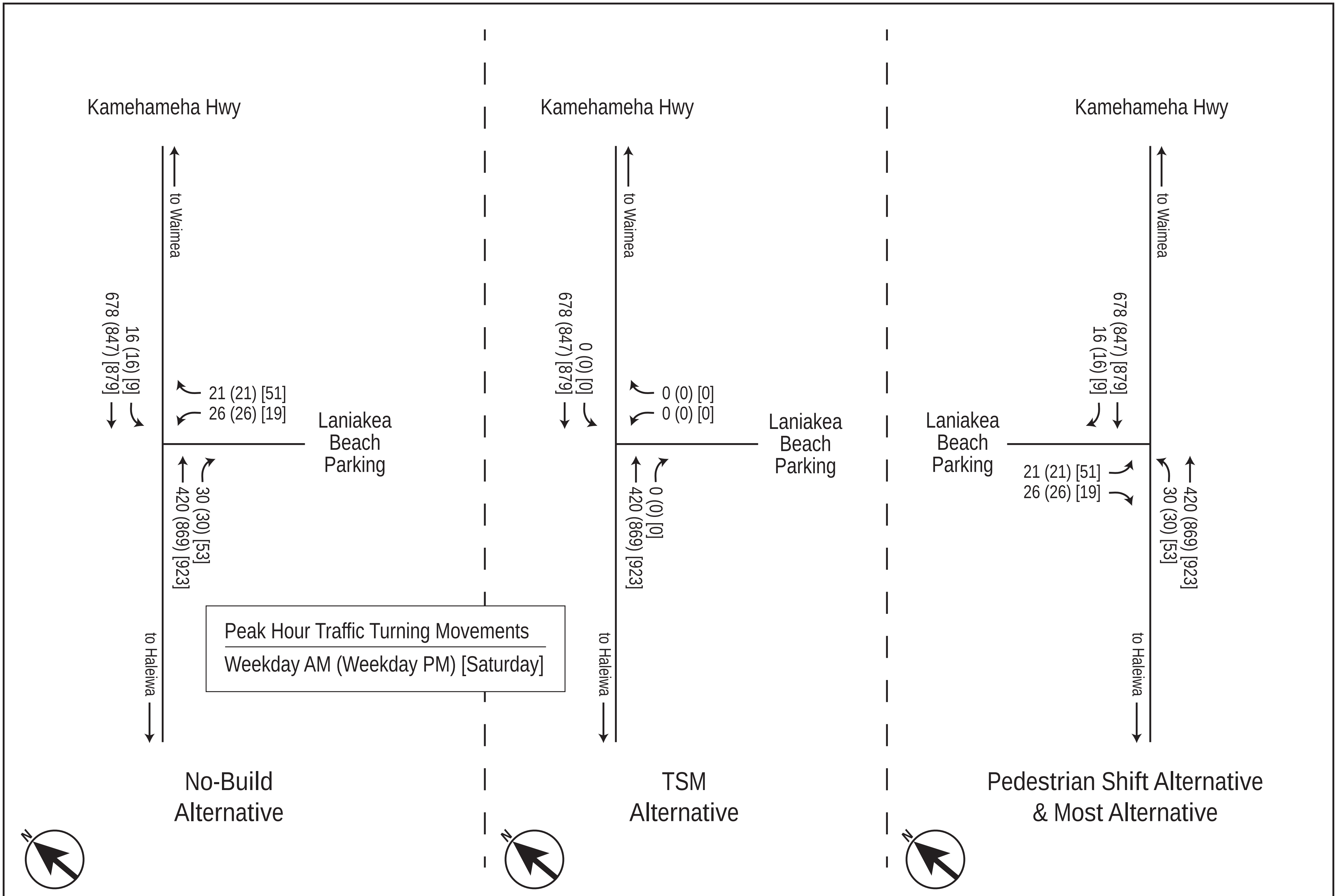
Existing Weekday PM Travel Times

Figure 7



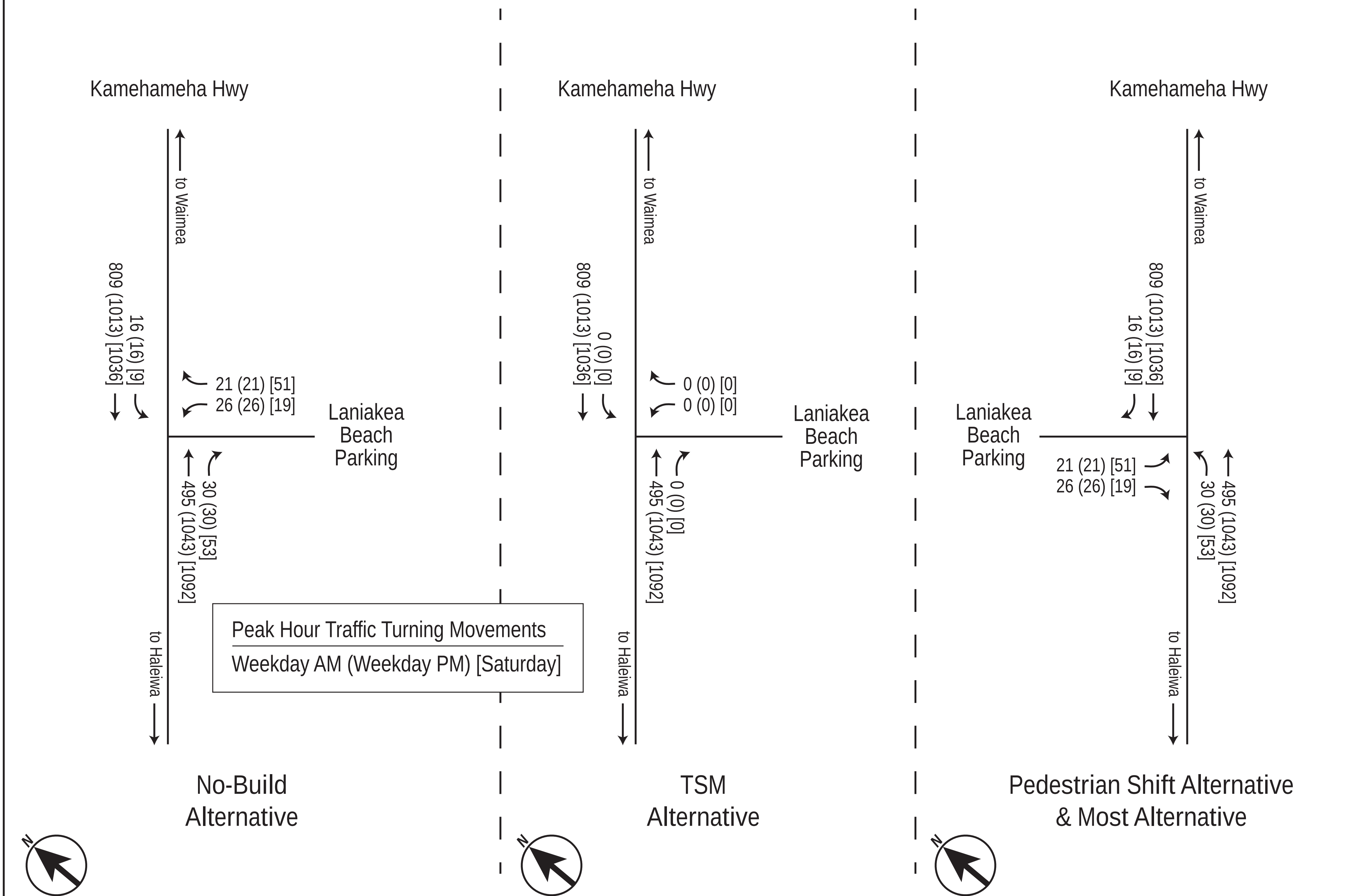
Existing Saturday PM Travel Times

Figure
8



Projected Future 2030 Traffic Volumes

Figure 9



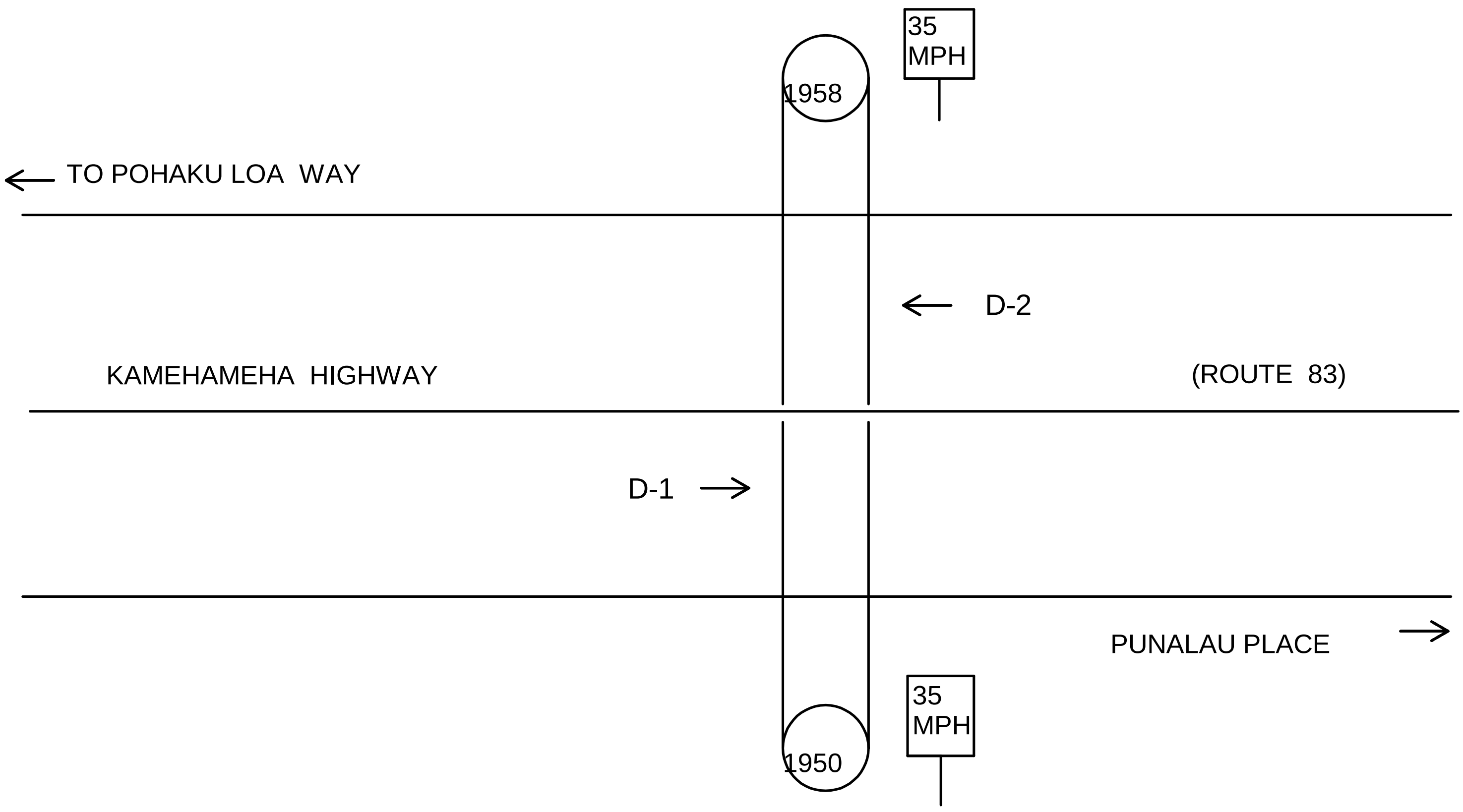
Projected Future 2050 Traffic Volumes

Figure 10

APPENDIX A TRAFFIC DATA

ISLAND:	OAHU
AREA:	HALEIWA

CHUN'S REEF



Station No:	B72 0083 00358

Station Location:			
Kamehameha Highway between Pohaku Loa Way (N Jct.) & Punalau Pl.			
Station Mileage:	3.95	GPS Coord (Latitude):	21.623966 N
		GPS Coord (Longitude):	158.078257 W
Begin Survey (Date/Time):	9-14-15 0000	End Survey (Date/Time):	9-17-15 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	FIELD CREW	Module No.:	

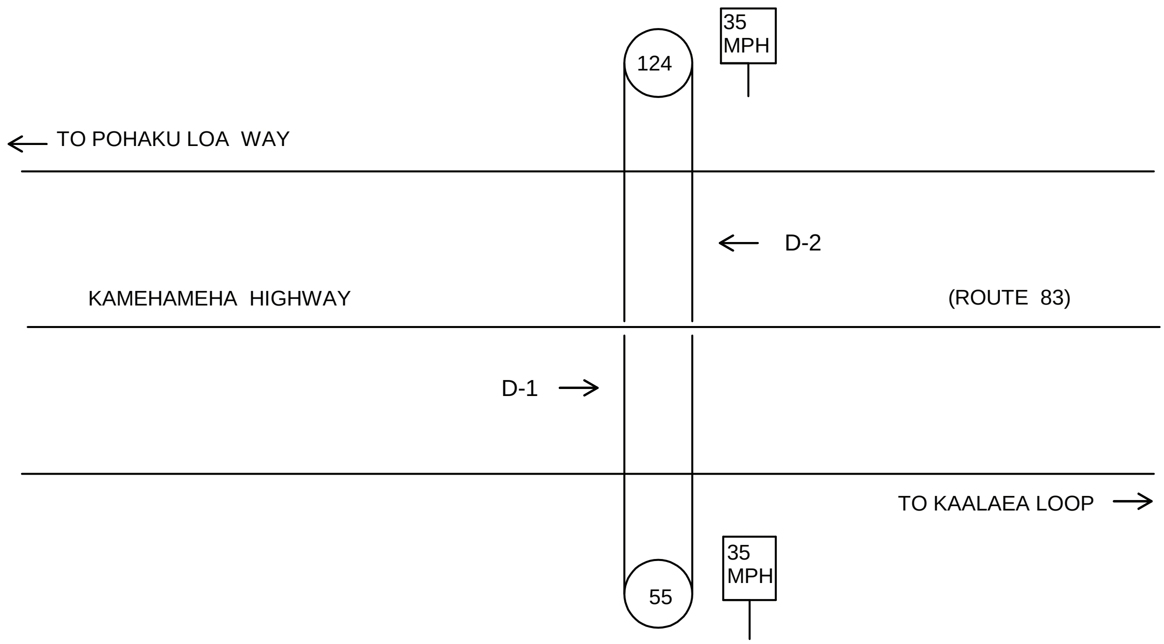
HPMS DATA					
Segment Description:					
JP LEONG HIGHWAY: KAMEHAMEHA HIGHWAY TO PUPUKEA ROAD.					
Segment Begin LRS	1.86	Segment End LRS	6.33	Length	4.47

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile	D-1 = Direction to End of Route / D-2 = Direction to Beginning of Route	
KAMEHAMEHA HIGHWAY	S	2	1	83	3.95	D-1	TO KALANIANAOLE HWY AND PALI HIGHWAY
						D-2	TO KAM HWY/KAUKONAHUA RD & J. P. LEONG HWY JCT.

Sketch By: RG Date: 1/10/2012 SLD: 2009

ISLAND: OAHU
AREA: HALEIWA

CHUN'S REEF



Station No:	B72 0083 00186

Station Location:			
Kamehameha Highway between Chun's Reef and Kaalaea Loop at the 35 MPH sign on both sides of the roadway			
Station Mileage:	3.95	GPS Coord (Latitude):	21.62213 N
		GPS Coord (Longitude):	158.08102 W
Begin Survey (Date/Time):	3-20-12 0000	End Survey (Date/Time):	3-22-12 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	CA, CO, LT, RG	Module No.:	

HPMS DATA					
Segment Description:					
JP LEONG HIGHWAY: KAMEHAMEHA HIGHWAY TO PUPUKEA ROAD.					
Segment Begin LRS	1.86	Segment End LRS	6.33	Length	4.47

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile	D-1 = Direction to End of Route D-2 = Direction to Beginning of Route	
KAMEHAMEHA HIGHWAY	S	2	1	83	3.95	D-1	TO KALANIANAOLE HWY AND PALI HIGHWAY
						D-2	TO KAM HWY/KAUKONAHUA RD & J. P. LEONG HWY JCT.

Sketch By: RG Date: 1/10/2012 SLD: 2009

Run Date: 2013/03/05

Hawaii Department of Transportation

Highways Division **Highways Planning Survey Section**

2012 Program Count - Summary

Site ID: B72008300186 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 14800

Functional Class: RURAL:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83

Location: KAMEHAMEHA Hwy - JOSEPH P. LEONG Hwy

DATE : 03/20/2012

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
12:00-12:15	19	8	27	06:00-06:15	40	80	120	12:00-12:15	177	103	280	06:00-06:15	111	108	219
12:15-12:30	8	6	14	06:15-06:30	36	84	120	12:15-12:30	165	117	282	06:15-06:30	122	108	230
12:30-12:45	7	5	12	06:30-06:45	60	84	144	12:30-12:45	138	102	240	06:30-06:45	107	84	191
12:45-01:00	8	6	14	06:45-07:00	59	106	165	12:45-01:00	145	143	288	06:45-07:00	102	169	271
01:00-01:15	5	0	5	07:00-07:15	78	123	201	01:00-01:15	144	110	254	07:00-07:15	96	116	212
01:15-01:30	8	2	10	07:15-07:30	74	130	204	01:15-01:30	141	125	266	07:15-07:30	92	88	180
01:30-01:45	5	6	11	07:30-07:45	84	141	225	01:30-01:45	172	128	300	07:30-07:45	87	55	142
01:45-02:00	7	2	9	07:45-08:00	61	108	169	01:45-02:00	148	168	316	07:45-08:00	66	58	124
02:00-02:15	7	3	10	08:00-08:15	53	118	171	02:00-02:15	133	150	283	08:00-08:15	60	34	94
02:15-02:30	5	2	7	08:15-08:30	72	120	192	02:15-02:30	159	137	296	08:15-08:30	74	28	102
02:30-02:45	2	1	3	08:30-08:45	85	112	197	02:30-02:45	163	181	344	08:30-08:45	69	34	103
02:45-03:00	4	5	9	08:45-09:00	64	107	171	02:45-03:00	153	152	305	08:45-09:00	60	33	93
03:00-03:15	4	3	7	09:00-09:15	95	109	204	03:00-03:15	158	144	302	09:00-09:15	60	27	87
03:15-03:30	3	4	7	09:15-09:30	93	106	199	03:15-03:30	170	177	347	09:15-09:30	62	25	87
03:30-03:45	2	6	8	09:30-09:45	97	102	199	03:30-03:45	156	192	348	09:30-09:45	46	34	80
03:45-04:00	7	6	13	09:45-10:00	108	117	225	03:45-04:00	151	173	324	09:45-10:00	49	37	86
04:00-04:15	9	8	17	10:00-10:15	100	114	214	04:00-04:15	155	159	314	10:00-10:15	48	30	78
04:15-04:30	5	11	16	10:15-10:30	120	123	243	04:15-04:30	145	179	324	10:15-10:30	36	15	51
04:30-04:45	12	17	29	10:30-10:45	144	104	248	04:30-04:45	158	153	311	10:30-10:45	31	12	43
04:45-05:00	20	35	55	10:45-11:00	135	108	243	04:45-05:00	153	122	275	10:45-11:00	28	8	36
05:00-05:15	15	46	61	11:00-11:15	134	112	246	05:00-05:15	139	136	275	11:00-11:15	29	9	38
05:15-05:30	15	59	74	11:15-11:30	148	116	264	05:15-05:30	143	128	271	11:15-11:30	19	12	31
05:30-05:45	30	67	97	11:30-11:45	137	133	270	05:30-05:45	135	122	257	11:30-11:45	17	6	23
05:45-06:00	26	65	91	11:45-12:00	161	95	256	05:45-06:00	156	108	264	11:45-12:00	17	4	21

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM			PM - PEAK HR TIME	03:15 PM to 04:15 PM		
AM - PEAK HR VOLUME	297	502	799	PM - PEAK HR VOLUME	632	701	1333
AM - K FACTOR (%)			5.26	PM - K FACTOR (%)			8.78
AM - D (%)	37.17	62.83	100.00	PM - D (%)	47.41	52.59	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM	07:00 AM to 08:00 AM		PM - PEAK HR TIME	03:00 PM to 04:00 PM	03:30 PM to 04:30 PM	
AM - PEAK HR VOLUME	297	502		PM - PEAK HR VOLUME	635	703	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM			PM - PEAK HR TIME	03:15 PM to 04:15 PM		
AM - PEAK HR VOLUME	580	456	1036	PM - PEAK HR VOLUME	632	701	1333
AM - K FACTOR (%)			6.82	PM - K FACTOR (%)			8.78
AM - D (%)	55.98	44.02	100.00	PM - D (%)	47.41	52.59	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	01:45 PM to 02:45 PM		
PEAK HR VOLUME	603	636	1239
DIRECTIONAL PEAK			
PEAK HR TIME	11:45 AM to 12:45 PM	01:45 PM to 02:45 PM	
PEAK HR VOLUME	641	636	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,238	2,652	4,890
AM 12-HR PERIOD (00:00-12:00)	2,471	3,025	5,496
PM 6-HR PERIOD (12:00-18:00)	3,657	3,409	7,066
PM 12-HR PERIOD (12:00-24:00)	5,145	4,543	9,688
24 HOUR PERIOD	7,616	7,568	15,184
D (%)	50.16	49.84	100.00

Run Date: 2013/03/05

Hawaii Department of Transportation

Highways Division — Highways Planning Survey Section

2012 Program Count - Summary

Site ID: B72008300186
Functional Class: RURAL:PRINCIPAL ARTERIAL - OTHER
Location: KAMEHAMEHA Hwy - JOSEPH P. LEONG Hwy

Town: Oahu
Count Type: CLASS
DIR 1: +MP **DIR 2:** -MP
Counter Type: Tube
Final AADT: 14800
Route No: 83

DATE : 03/21/2012

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
12:00-12:15	11	9	20	06:00-06:15	48	75	123	12:00-12:15	148	129	277	06:00-06:15	139	94	233
12:15-12:30	12	12	24	06:15-06:30	43	99	142	12:15-12:30	163	154	317	06:15-06:30	121	105	226
12:30-12:45	5	2	7	06:30-06:45	65	110	175	12:30-12:45	151	139	290	06:30-06:45	113	81	194
12:45-01:00	16	3	19	06:45-07:00	69	106	175	12:45-01:00	164	130	294	06:45-07:00	121	100	221
01:00-01:15	4	2	6	07:00-07:15	73	127	200	01:00-01:15	147	152	299	07:00-07:15	103	140	243
01:15-01:30	4	6	10	07:15-07:30	88	111	199	01:15-01:30	148	140	288	07:15-07:30	88	85	173
01:30-01:45	3	4	7	07:30-07:45	110	143	253	01:30-01:45	129	147	276	07:30-07:45	80	76	156
01:45-02:00	6	5	11	07:45-08:00	74	170	244	01:45-02:00	157	129	286	07:45-08:00	85	47	132
02:00-02:15	6	2	8	08:00-08:15	70	127	197	02:00-02:15	157	155	312	08:00-08:15	76	45	121
02:15-02:30	6	5	11	08:15-08:30	83	141	224	02:15-02:30	140	157	297	08:15-08:30	67	33	100
02:30-02:45	4	3	7	08:30-08:45	105	111	216	02:30-02:45	167	169	336	08:30-08:45	76	29	105
02:45-03:00	0	8	8	08:45-09:00	106	137	243	02:45-03:00	164	154	318	08:45-09:00	77	22	99
03:00-03:15	3	1	4	09:00-09:15	88	133	221	03:00-03:15	177	157	334	09:00-09:15	63	40	103
03:15-03:30	4	2	6	09:15-09:30	90	126	216	03:15-03:30	169	167	336	09:15-09:30	48	23	71
03:30-03:45	5	6	11	09:30-09:45	109	115	224	03:30-03:45	182	154	336	09:30-09:45	38	55	93
03:45-04:00	7	6	13	09:45-10:00	102	153	255	03:45-04:00	166	164	330	09:45-10:00	41	42	83
04:00-04:15	7	14	21	10:00-10:15	123	122	245	04:00-04:15	172	164	336	10:00-10:15	40	22	62
04:15-04:30	5	13	18	10:15-10:30	108	120	228	04:15-04:30	164	148	312	10:15-10:30	36	18	54
04:30-04:45	15	21	36	10:30-10:45	104	97	201	04:30-04:45	177	126	303	10:30-10:45	38	11	49
04:45-05:00	14	31	45	10:45-11:00	126	139	265	04:45-05:00	149	157	306	10:45-11:00	23	18	41
05:00-05:15	16	32	48	11:00-11:15	118	108	226	05:00-05:15	140	144	284	11:00-11:15	25	19	44
05:15-05:30	23	55	78	11:15-11:30	136	124	260	05:15-05:30	151	139	290	11:15-11:30	20	13	33
05:30-05:45	48	59	107	11:30-11:45	133	139	272	05:30-05:45	151	133	284	11:30-11:45	15	9	24
05:45-06:00	56	65	121	11:45-12:00	145	122	267	05:45-06:00	145	129	274	11:45-12:00	13	0	13

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM			PM - PEAK HR TIME	03:15 PM to 04:15 PM		
AM - PEAK HR VOLUME	337	581	918	PM - PEAK HR VOLUME	689	649	1338
AM - K FACTOR (%)			5.77	PM - K FACTOR (%)			8.41
AM - D (%)	36.71	63.29	100.00	PM - D (%)	51.49	48.51	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:30 AM to 08:30 AM		PM - PEAK HR TIME	03:00 PM to 04:00 PM	03:15 PM to 04:15 PM	
AM - PEAK HR VOLUME	364	581		PM - PEAK HR VOLUME	694	649	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM			PM - PEAK HR TIME	03:15 PM to 04:15 PM		
AM - PEAK HR VOLUME	532	493	1025	PM - PEAK HR VOLUME	689	649	1338
AM - K FACTOR (%)			6.44	PM - K FACTOR (%)			8.41
AM - D (%)	51.90	48.10	100.00	PM - D (%)	51.49	48.51	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM		
PEAK HR VOLUME	628	635	1263
DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM	02:00 PM to 03:00 PM	
PEAK HR VOLUME	628	635	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,316	2,955	5,271
AM 12-HR PERIOD (00:00-12:00)	2,596	3,321	5,917
PM 6-HR PERIOD (12:00-18:00)	3,778	3,537	7,315
PM 12-HR PERIOD (12:00-24:00)	5,324	4,664	9,988
24 HOUR PERIOD	7,920	7,985	15,905
D (%)	49.80	50.20	100.00

Run Date: 2013/03/05

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2012

Site ID:	**B72008300186**	**Route No:**	**83**	**Date From:**	2012/03/20 0:00
Town:	**Oahu**	**Direction:**	+MP	**Date To:**	2012/03/21 23:45

Location: **KAMEHAMEHA Hwy - JOSEPH P. LEONG Hwy**

Functional Classification: **2 RURAL:PRINCIPAL ARTERIAL - OTHER**

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	208	0.67%	417
PC	29163	93.80%	58326
2A-4T	1084	3.49%	2168
LIGHT VEHICLE TOTALS	30455	97.96%	60910
HEAVY VEHICLES			
Bus	43	0.14%	109
SINGLE UNIT TRUCK			
2A-6T	357	1.15%	714
3A-SU	152	0.49%	456
4A-SU	0	0.00%	0
SINGLE-TRAILER TRUCKS			
4A-ST	38	0.12%	152
5A-ST	39	0.13%	195
6A-ST	0	0.00%	0
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	5	0.02%	35
HEAVY VEHICLE TOTALS	635	2.04%	1661
CLASSIFIED VEHICLES TOTALS	31090 (A)	100.00%	62571 (B)
UNCLASSIFIED VEHICLES TOTALS	-1	-0.00%	

AXLE CORRECTION FACTOR (A/C) = 0.994

ROADTUBE EQUIVALENT(B/2) = 31285 (C)

PEAK HOUR VOLUME : 1336 **2012/03/21 15:00**	**PEAK HOUR TRUCK VOLUME**	**% TOTAL PEAK HOUR VOLUME**	**24 HOUR TRUCK VOLUME**	**AADT**	**% OF AADT**	**HPMS K-FACTOR (PEAK/AADT) (ITEM 66)**
SINGLE UNIT TRUCKS (TYPE 4-7)	**17**	**(65A-1)** **1.29%**	**273**	**14800**	**(65A-2)** **1.84%**	**9.03%**
COMBINATION (TYPE 8-13)	**2**	**(65B-1)** **0.15%**	**40**		**(65B-2)** **0.27%**	**9.03%**

Run Date: 2016/06/07

Hawaii Department of Transportation

Highways Division — Highways Planning Survey Section

2015 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16900
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 09/15/2015															
12:00-12:15	8	6	14	06:00-06:15	46	53	99	12:00-12:15	139	100	239	06:00-06:15	104	111	215
12:15-12:30	8	9	17	06:15-06:30	60	79	139	12:15-12:30	164	121	285	06:15-06:30	119	90	209
12:30-12:45	13	5	18	06:30-06:45	65	107	172	12:30-12:45	148	132	280	06:30-06:45	106	67	173
12:45-01:00	8	4	12	06:45-07:00	53	82	135	12:45-01:00	139	125	264	06:45-07:00	99	80	179
01:00-01:15	5	3	8	07:00-07:15	77	96	173	01:00-01:15	159	135	294	07:00-07:15	92	65	157
01:15-01:30	2	1	3	07:15-07:30	81	123	204	01:15-01:30	162	123	285	07:15-07:30	87	95	182
01:30-01:45	6	6	12	07:30-07:45	73	128	201	01:30-01:45	138	133	271	07:30-07:45	80	68	148
01:45-02:00	9	4	13	07:45-08:00	86	133	219	01:45-02:00	142	122	264	07:45-08:00	69	38	107
02:00-02:15	3	4	7	08:00-08:15	95	136	231	02:00-02:15	144	163	307	08:00-08:15	66	37	103
02:15-02:30	0	1	1	08:15-08:30	77	123	200	02:15-02:30	155	169	324	08:15-08:30	47	38	85
02:30-02:45	3	2	5	08:30-08:45	92	111	203	02:30-02:45	136	162	298	08:30-08:45	69	36	105
02:45-03:00	1	5	6	08:45-09:00	94	109	203	02:45-03:00	154	152	306	08:45-09:00	53	39	92
03:00-03:15	4	2	6	09:00-09:15	91	119	210	03:00-03:15	171	156	327	09:00-09:15	50	28	78
03:15-03:30	5	6	11	09:15-09:30	100	113	213	03:15-03:30	124	181	305	09:15-09:30	47	24	71
03:30-03:45	4	7	11	09:30-09:45	103	108	211	03:30-03:45	184	136	320	09:30-09:45	54	35	89
03:45-04:00	5	5	10	09:45-10:00	111	126	237	03:45-04:00	160	164	324	09:45-10:00	42	27	69
04:00-04:15	4	14	18	10:00-10:15	129	113	242	04:00-04:15	160	151	311	10:00-10:15	35	13	48
04:15-04:30	9	20	29	10:15-10:30	116	106	222	04:15-04:30	157	154	311	10:15-10:30	40	15	55
04:30-04:45	14	22	36	10:30-10:45	109	118	227	04:30-04:45	141	131	272	10:30-10:45	29	16	45
04:45-05:00	9	29	38	10:45-11:00	145	123	268	04:45-05:00	129	128	257	10:45-11:00	29	13	42
05:00-05:15	18	55	73	11:00-11:15	150	127	277	05:00-05:15	117	127	244	11:00-11:15	36	12	48
05:15-05:30	26	54	80	11:15-11:30	156	128	284	05:15-05:30	118	116	234	11:15-11:30	32	10	42
05:30-05:45	22	69	91	11:30-11:45	138	106	244	05:30-05:45	156	119	275	11:30-11:45	22	9	31
05:45-06:00	36	71	107	11:45-12:00	176	129	305	05:45-06:00	124	106	230	11:45-12:00	12	5	17

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM			PM - PEAK HR TIME	03:00 PM to 04:00 PM		
AM - PEAK HR VOLUME	335	520	855	PM - PEAK HR VOLUME	639	637	1276
AM - K FACTOR (%)			5.71	PM - K FACTOR (%)			8.53
AM - D (%)	39.18	60.82	100.00	PM - D (%)	50.08	49.92	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:15 AM to 08:15 AM		PM - PEAK HR TIME	03:30 PM to 04:30 PM	03:00 PM to 04:00 PM	
AM - PEAK HR VOLUME	358	520		PM - PEAK HR VOLUME	661	637	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM			PM - PEAK HR TIME	03:00 PM to 04:00 PM		
AM - PEAK HR VOLUME	620	490	1110	PM - PEAK HR VOLUME	639	637	1276
AM - K FACTOR (%)			7.42	PM - K FACTOR (%)			8.53
AM - D (%)	55.86	44.14	100.00	PM - D (%)	50.08	49.92	100.00

NON-COMMUTER PERIOD (09:00-15:00)				6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
TWO DIRECTIONAL PEAK				AM 6-HR PERIOD (06:00-12:00)	2,423	2,696	5,119
PEAK HR TIME	02:00 PM to 03:00 PM			AM 12-HR PERIOD (00:00-12:00)	2,645	3,100	5,745
PEAK HR VOLUME	589	646	1235	PM 6-HR PERIOD (12:00-18:00)	3,521	3,306	6,827
DIRECTIONAL PEAK				PM 12-HR PERIOD (12:00-24:00)	4,940	4,277	9,217
PEAK HR TIME	11:45 AM to 12:45 PM	02:00 PM to 03:00 PM		24 HOUR PERIOD	7,585	7,377	14,962
PEAK HR VOLUME	627	646		D (%)	50.70	49.30	100.00

Run Date: 2016/06/07

Hawaii Department of Transportation

Highways Division **Highways Planning Survey Section**

2015 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16900
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 09/16/2015															
12:00-12:15	9	10	19	06:00-06:15	41	58	99	12:00-12:15	137	101	238	06:00-06:15	118	97	215
12:15-12:30	12	7	19	06:15-06:30	67	74	141	12:15-12:30	143	102	245	06:15-06:30	100	111	211
12:30-12:45	13	3	16	06:30-06:45	56	86	142	12:30-12:45	80	107	187	06:30-06:45	103	97	200
12:45-01:00	10	6	16	06:45-07:00	55	93	148	12:45-01:00	85	140	225	06:45-07:00	106	90	196
01:00-01:15	11	0	11	07:00-07:15	73	118	191	01:00-01:15	146	161	307	07:00-07:15	91	94	185
01:15-01:30	5	4	9	07:15-07:30	90	119	209	01:15-01:30	204	153	357	07:15-07:30	92	74	166
01:30-01:45	4	2	6	07:30-07:45	75	139	214	01:30-01:45	164	128	292	07:30-07:45	101	74	175
01:45-02:00	4	2	6	07:45-08:00	86	140	226	01:45-02:00	142	156	298	07:45-08:00	82	52	134
02:00-02:15	5	4	9	08:00-08:15	67	105	172	02:00-02:15	136	132	268	08:00-08:15	84	41	125
02:15-02:30	4	2	6	08:15-08:30	94	103	197	02:15-02:30	159	147	306	08:15-08:30	59	33	92
02:30-02:45	4	3	7	08:30-08:45	80	118	198	02:30-02:45	163	129	292	08:30-08:45	57	29	86
02:45-03:00	1	4	5	08:45-09:00	74	110	184	02:45-03:00	162	136	298	08:45-09:00	57	28	85
03:00-03:15	4	3	7	09:00-09:15	79	111	190	03:00-03:15	136	129	265	09:00-09:15	55	38	93
03:15-03:30	3	3	6	09:15-09:30	79	112	191	03:15-03:30	153	164	317	09:15-09:30	61	19	80
03:30-03:45	6	7	13	09:30-09:45	83	102	185	03:30-03:45	162	152	314	09:30-09:45	55	60	115
03:45-04:00	6	9	15	09:45-10:00	85	117	202	03:45-04:00	166	144	310	09:45-10:00	49	33	82
04:00-04:15	6	9	15	10:00-10:15	113	90	203	04:00-04:15	181	159	340	10:00-10:15	36	31	67
04:15-04:30	10	16	26	10:15-10:30	103	109	212	04:15-04:30	152	167	319	10:15-10:30	35	13	48
04:30-04:45	9	28	37	10:30-10:45	105	107	212	04:30-04:45	160	162	322	10:30-10:45	38	12	50
04:45-05:00	7	28	35	10:45-11:00	120	102	222	04:45-05:00	130	133	263	10:45-11:00	33	13	46
05:00-05:15	17	37	54	11:00-11:15	114	124	238	05:00-05:15	148	122	270	11:00-11:15	22	8	30
05:15-05:30	26	43	69	11:15-11:30	116	113	229	05:15-05:30	152	106	258	11:15-11:30	14	12	26
05:30-05:45	27	53	80	11:30-11:45	126	106	232	05:30-05:45	151	137	288	11:30-11:45	18	11	29
05:45-06:00	29	70	99	11:45-12:00	131	114	245	05:45-06:00	129	142	271	11:45-12:00	11	21	32

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2		PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM			PM - PEAK HR TIME	03:45 PM to 04:45 PM		
AM - PEAK HR VOLUME	324	516	840	PM - PEAK HR VOLUME	659	632	1291
AM - K FACTOR (%)			5.72	PM - K FACTOR (%)			8.79
AM - D (%)	38.57	61.43	100.00	PM - D (%)	51.05	48.95	100.00
DIRECTIONAL PEAK				DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:45 AM to 08:45 AM	07:00 AM to 08:00 AM		PM - PEAK HR TIME	03:15 PM to 04:15 PM	03:45 PM to 04:45 PM	
AM - PEAK HR VOLUME	327	516		PM - PEAK HR VOLUME	662	632	

AM PERIOD (00:00-12:00)				PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK				TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM			PM - PEAK HR TIME	03:45 PM to 04:45 PM		
AM - PEAK HR VOLUME	487	457	944	PM - PEAK HR VOLUME	659	632	1291
AM - K FACTOR (%)			6.43	PM - K FACTOR (%)			8.79
AM - D (%)	51.59	48.41	100.00	PM - D (%)	51.05	48.95	100.00

NON-COMMUTER PERIOD (09:00-15:00)				6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
TWO DIRECTIONAL PEAK				AM 6-HR PERIOD (06:00-12:00)	2,112	2,570	4,682
PEAK HR TIME	01:00 PM to 02:00 PM			AM 12-HR PERIOD (00:00-12:00)	2,344	2,923	5,267
PEAK HR VOLUME	656	598	1254	PM 6-HR PERIOD (12:00-18:00)	3,541	3,309	6,850
DIRECTIONAL PEAK				PM 12-HR PERIOD (12:00-24:00)	5,018	4,400	9,418
PEAK HR TIME	01:00 PM to 02:00 PM	01:00 PM to 02:00 PM		24 HOUR PERIOD	7,362	7,323	14,685
PEAK HR VOLUME	656	598		D (%)	50.13	49.87	100.00

Run Date: 2016/06/07

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2015

Site ID: B72008300358 **Route No:** 83 **Date From:** 2015/09/15 0:00

Town: Oahu **Direction:** +MP **Date To:** 2015/09/16 23:45

Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

Functional Classification: 14 URBAN:PRINCIPAL ARTERIAL - OTHER

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	299	1.01%	599
PC	24952	84.16%	49905
2A-4T	3645	12.29%	7290
LIGHT VEHICLE TOTALS	28897	97.47%	57793
HEAVY VEHICLES			
Bus	139	0.47%	348
SINGLE UNIT TRUCK			
2A-6T	300	1.01%	600
3A-SU	137	0.46%	411
4A-SU	4	0.01%	16
SINGLE-TRAILER TRUCKS			
4A-ST	79	0.27%	316
5A-ST	63	0.21%	315
6A-ST	6	0.02%	36
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	20	0.07%	140
HEAVY VEHICLE TOTALS	750	2.53%	2182
CLASSIFIED VEHICLES TOTALS	29646 (A)	100.00%	59976 (B)
UNCLASSIFIED VEHICLES TOTALS	1	0.00%	

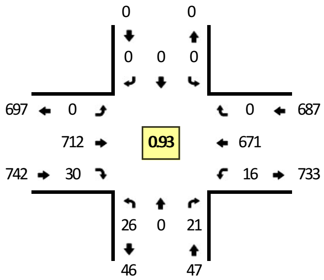
AXLE CORRECTION FACTOR (A/C) = 0.989

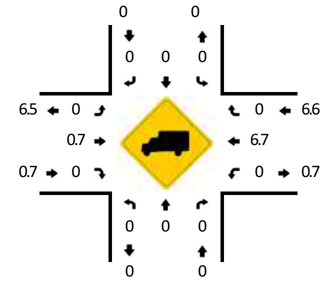
ROADTUBE EQUIVALENT(B/2) = 29988 (C)

PEAK HOUR VOLUME : 1276 2015/09/15 15:00	PEAK HOUR TRUCK VOLUME	% TOTAL PEAK HOUR VOLUME	24 HOUR TRUCK VOLUME	AADT	% OF AADT	HPMS K-FACTOR (PEAK/AADT) (ITEM 66)
SINGLE UNIT TRUCKS (TYPE 4-7)	10	(65A-1) 0.80%	285	16900	(65A-2) 1.69%	7.55%
COMBINATION (TYPE 8-13)	8	(65B-1) 0.64%	82		(65B-2) 0.49%	7.55%

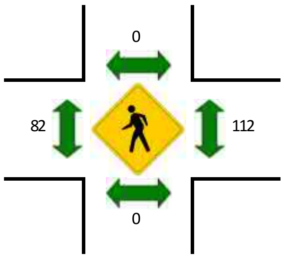
LOCATION: Laniakea Beach Parking -- Kamehameha Hwy | **QC JOB #:** 15153903
CITY/STATE: Honolulu County, HI | **DATE:** Thu, Jan 16 2020

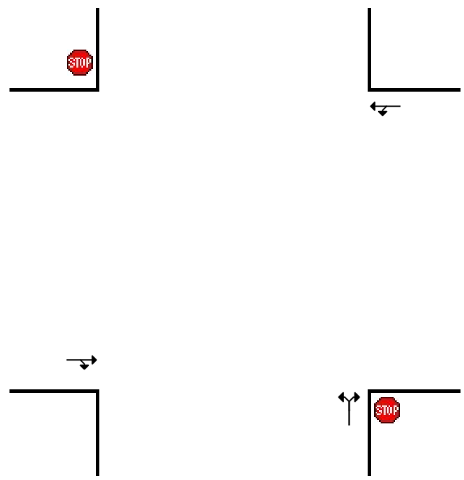
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

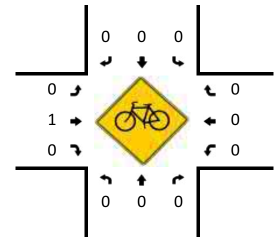


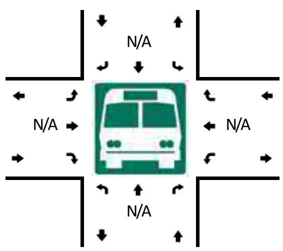


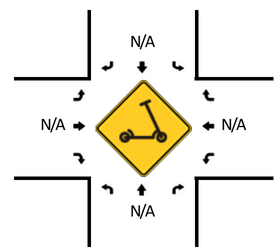
Quality Counts
DATA THAT DRIVES COMMUNITIES











15-Min Count Period Beginning At	Laniakea Beach Parking (Northbound)				Laniakea Beach Parking (Southbound)				Kamehameha Hwy (Eastbound)				Kamehameha Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	9	0	5	0	0	0	0	0	0	139	7	0	2	142	0	0	304	
11:15 AM	1	0	9	0	0	0	0	0	0	124	11	0	1	120	0	0	266	
11:30 AM	2	0	5	0	0	0	0	0	0	156	6	0	1	114	0	0	284	
11:45 AM	5	0	15	0	0	0	0	0	0	164	10	0	4	135	0	0	333	1187
12:00 PM	2	0	9	0	0	0	0	0	0	146	16	0	4	112	0	0	289	1172
12:15 PM	2	0	10	0	0	0	0	0	0	147	11	0	1	128	0	0	299	1205
12:30 PM	1	0	7	0	0	0	0	0	0	134	1	0	4	138	0	0	285	1206
12:45 PM	8	0	13	0	0	0	0	0	0	145	18	0	1	139	0	0	324	1197
1:00 PM	7	0	9	0	0	0	0	0	0	162	9	0	2	159	0	0	348	1256
1:15 PM	7	0	12	0	0	0	0	0	0	167	9	0	4	164	0	0	363	1320
1:30 PM	3	0	10	0	0	0	0	0	0	140	13	0	5	157	0	0	328	1363
1:45 PM	5	0	5	0	0	0	0	0	0	143	10	0	2	142	0	0	307	1346
2:00 PM	2	0	6	0	0	0	0	0	0	164	10	0	5	145	0	0	332	1330
2:15 PM	2	0	6	0	0	0	0	0	0	157	6	0	4	156	0	0	331	1298
2:30 PM	5	0	9	0	0	0	0	0	0	170	10	0	8	167	0	0	369	1339
2:45 PM	6	0	8	0	0	0	0	0	0	146	11	0	1	158	0	0	330	1362
3:00 PM	7	0	11	0	0	0	0	0	0	175	10	0	3	154	0	0	360	1390
3:15 PM	3	0	13	0	0	0	0	0	0	163	10	0	5	158	0	0	352	1411
3:30 PM	5	0	14	0	0	0	0	0	0	139	10	0	3	143	0	0	314	1356
3:45 PM	8	0	6	0	0	0	0	0	0	154	7	0	5	128	0	0	308	1334
4:00 PM	8	0	4	0	0	0	0	0	0	197	5	0	2	182	0	0	398	1372
4:15 PM	4	0	5	0	0	0	0	0	0	176	11	0	6	150	0	0	352	1372
4:30 PM	8	0	6	0	0	0	0	0	0	189	8	0	2	162	0	0	375	1433
4:45 PM	6	0	6	0	0	0	0	0	0	150	6	0	6	177	0	0	351	1476

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	32	0	16	0	0	0	0	0	0	788	20	0	8	728	0	0	1592
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	40	0		52
Buses																	
Pedestrians		0				0				96				132			228
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

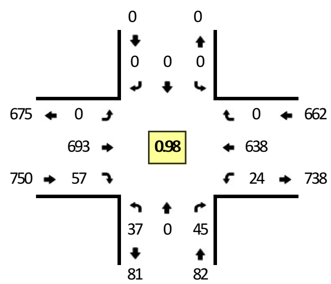
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

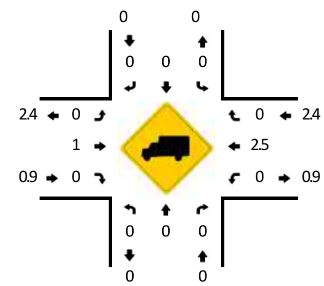
LOCATION: Laniakea Beach Parking -- Kamehameha Hwy | **QC JOB #:** 15153904

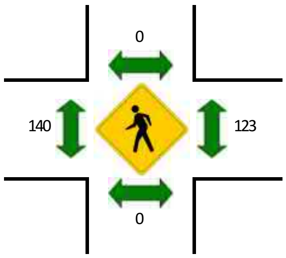
CITY/STATE: Honolulu County, HI | **DATE:** Sat, Jan 18 2020

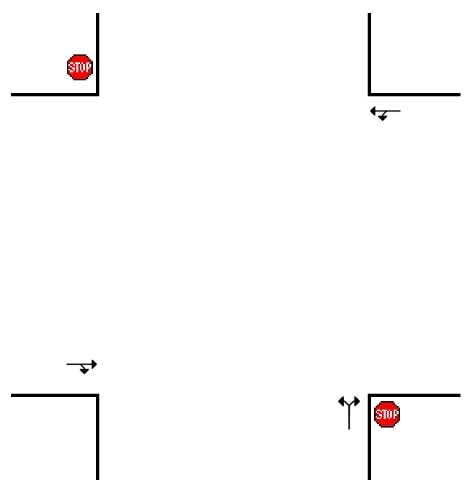
Peak-Hour: 2:15 PM -- 3:15 PM

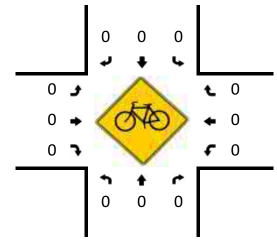
Peak 15-Min: 3:00 PM -- 3:15 PM

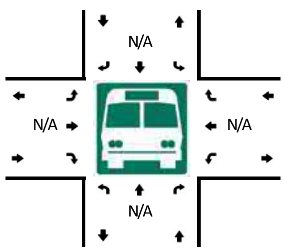


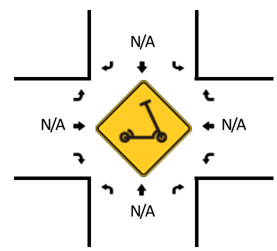












15-Min Count Period Beginning At	Laniakea Beach Parking (Northbound)				Laniakea Beach Parking (Southbound)				Kamehameha Hwy (Eastbound)				Kamehameha Hwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	1	0	13	0	0	0	0	0	0	181	7	0	2	171	0	0	375	
11:15 AM	4	0	14	0	0	0	0	0	0	170	15	0	1	130	0	0	334	
11:30 AM	3	0	11	0	0	0	0	0	0	175	10	0	3	150	0	0	352	
11:45 AM	1	0	5	0	0	0	0	0	0	173	12	0	3	165	0	0	359	1420
12:00 PM	6	0	11	0	0	0	0	0	0	163	16	0	5	142	0	0	343	1388
12:15 PM	4	0	6	0	0	0	0	0	0	184	14	0	4	124	0	0	336	1390
12:30 PM	3	0	16	0	0	0	0	0	0	171	15	0	2	152	0	0	359	1397
12:45 PM	8	0	14	0	0	0	0	0	0	162	13	0	2	166	0	0	365	1403
1:00 PM	5	0	12	0	0	0	0	0	0	180	12	0	1	159	0	0	369	1429
1:15 PM	3	0	9	0	0	0	0	0	0	181	13	0	4	170	0	0	380	1473
1:30 PM	3	0	14	0	0	0	0	0	0	160	12	0	7	146	0	0	342	1456
1:45 PM	8	0	6	0	0	0	0	0	0	151	12	0	2	161	0	0	340	1431
2:00 PM	11	0	12	0	0	0	0	0	0	159	5	0	3	155	0	0	345	1407
2:15 PM	10	0	11	0	0	0	0	0	0	167	16	0	7	155	0	0	366	1393
2:30 PM	7	0	10	0	0	0	0	0	0	170	10	0	10	156	0	0	363	1414
2:45 PM	12	0	13	0	0	0	0	0	0	182	12	0	2	161	0	0	382	1456
3:00 PM	8	0	11	0	0	0	0	0	0	174	19	0	5	166	0	0	383	1494
3:15 PM	4	0	7	0	0	0	0	0	0	183	13	0	0	141	0	0	348	1476
3:30 PM	9	0	12	0	0	0	0	0	0	171	9	0	9	145	0	0	355	1468
3:45 PM	9	0	6	0	0	0	0	0	0	163	17	0	3	163	0	0	361	1447
4:00 PM	13	0	10	0	0	0	0	0	0	151	15	0	9	146	0	0	344	1408
4:15 PM	8	0	5	0	0	0	0	0	0	179	5	0	4	179	0	0	380	1440
4:30 PM	11	0	5	0	0	0	0	0	0	174	11	0	4	158	0	0	363	1448
4:45 PM	9	0	6	0	0	0	0	0	0	152	15	0	4	176	0	0	362	1449

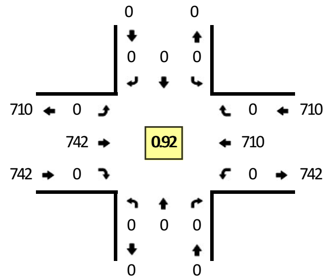
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	0	44	0	0	0	0	0	0	696	76	0	20	664	0	0	1532
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	20	0		20
Buses																	
Pedestrians		0				0				128				112			240
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

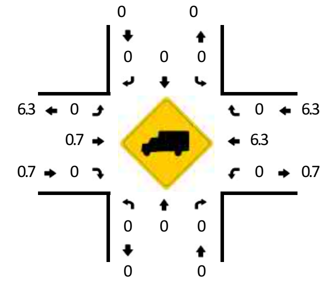
Report generated on 1/28/2020 4:35 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

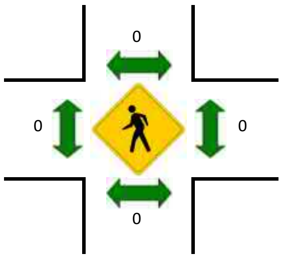
Type of peak hour being reported: Intersection Peak — Method for determining peak hour: Total Entering Volume

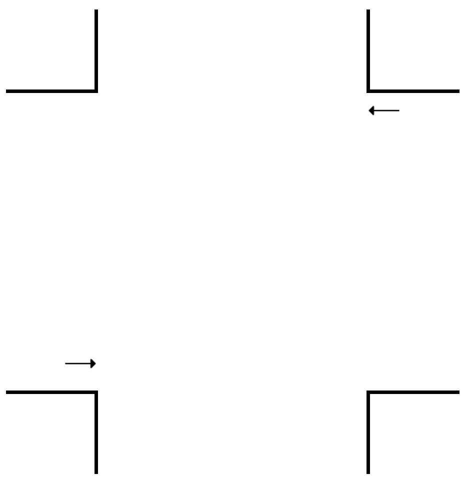
LOCATION: At Bridge -- Kamehameha Highway — **QC JOB #:** 15153905
CITY/STATE: Haleiwa, HI — **DATE:** Thu, Jan 16 2020

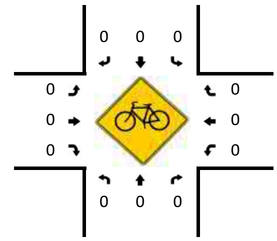


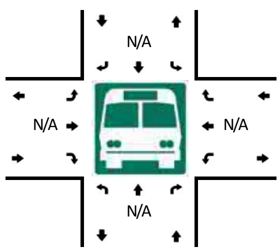
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

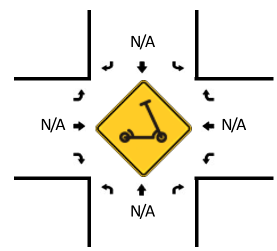












15-Min Count Period Beginning At	At Bridge (Northbound)				At Bridge (Southbound)				Kamehameha Highway (Eastbound)				Kamehameha Highway (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	0	0	0	0	146	0	0	0	151	0	0	297	
11:15 AM	0	0	0	0	0	0	0	0	0	135	0	0	0	122	0	0	257	
11:30 AM	0	0	0	0	0	0	0	0	0	162	0	0	0	114	0	0	276	
11:45 AM	0	0	0	0	0	0	0	0	0	174	0	0	0	142	0	0	316	1146
12:00 PM	0	0	0	0	0	0	0	0	0	162	0	0	0	114	0	0	276	1125
12:15 PM	0	0	0	0	0	0	0	0	0	158	0	0	0	131	0	0	289	1157
12:30 PM	0	0	0	0	0	0	0	0	0	135	0	0	0	140	0	0	275	1156
12:45 PM	0	0	0	0	0	0	0	0	0	163	0	0	0	151	0	0	314	1154
1:00 PM	0	0	0	0	0	0	0	0	0	171	0	0	0	167	0	0	338	1216
1:15 PM	0	0	0	0	0	0	0	0	0	176	0	0	0	171	0	0	347	1274
1:30 PM	0	0	0	0	0	0	0	0	0	153	0	0	0	161	0	0	314	1313
1:45 PM	0	0	0	0	0	0	0	0	0	153	0	0	0	145	0	0	298	1297
2:00 PM	0	0	0	0	0	0	0	0	0	174	0	0	0	148	0	0	322	1281
2:15 PM	0	0	0	0	0	0	0	0	0	163	0	0	0	159	0	0	322	1256
2:30 PM	0	0	0	0	0	0	0	0	0	180	0	0	0	175	0	0	355	1297
2:45 PM	0	0	0	0	0	0	0	0	0	157	0	0	0	165	0	0	322	1321
3:00 PM	0	0	0	0	0	0	0	0	0	185	0	0	0	164	0	0	349	1348
3:15 PM	0	0	0	0	0	0	0	0	0	174	0	0	0	161	0	0	335	1361
3:30 PM	0	0	0	0	0	0	0	0	0	149	0	0	0	152	0	0	301	1307
3:45 PM	0	0	0	0	0	0	0	0	0	161	0	0	0	141	0	0	302	1287
4:00 PM	0	0	0	0	0	0	0	0	0	202	0	0	0	194	0	0	396	1334
4:15 PM	0	0	0	0	0	0	0	0	0	187	0	0	0	156	0	0	343	1342
4:30 PM	0	0	0	0	0	0	0	0	0	197	0	0	0	176	0	0	373	1414
4:45 PM	0	0	0	0	0	0	0	0	0	156	0	0	0	184	0	0	340	1452

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	0	0	0	0	0	0	0	0	0	808	0	0	0	776	0	0	1584
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	40	0		52
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

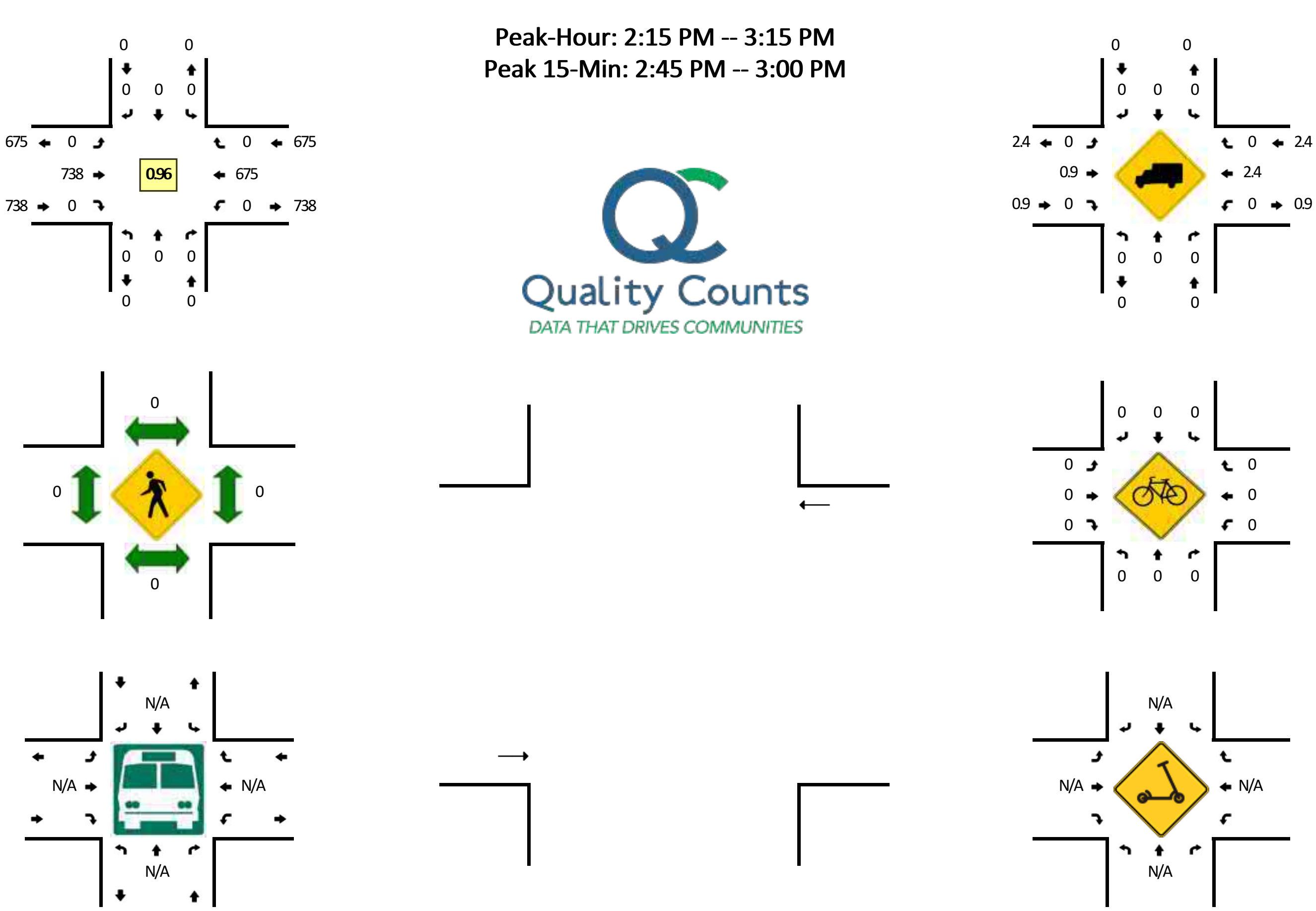
Comments:

Report generated on 1/28/2020 4:35 PM — 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: At Bridge -- Kamehameha Highway — **QC JOB #:** 15153906
CITY/STATE: Haleiwa, HI — **DATE:** Sat, Jan 18 2020

Peak-Hour: 2:15 PM -- 3:15 PM
Peak 15-Min: 2:45 PM -- 3:00 PM



15-Min Count Period Beginning At	At Bridge (Northbound)				At Bridge (Southbound)				Kamehameha Highway (Eastbound)				Kamehameha Highway (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	0	0	0	0	194	0	0	0	172	0	0	366	
11:15 AM	0	0	0	0	0	0	0	0	0	184	0	0	0	134	0	0	318	
11:30 AM	0	0	0	0	0	0	0	0	0	186	0	0	0	153	0	0	339	
11:45 AM	0	0	0	0	0	0	0	0	0	178	0	0	0	166	0	0	344	1367
12:00 PM	0	0	0	0	0	0	0	0	0	174	0	0	0	148	0	0	322	1323
12:15 PM	0	0	0	0	0	0	0	0	0	190	0	0	0	128	0	0	318	1323
12:30 PM	0	0	0	0	0	0	0	0	0	187	0	0	0	155	0	0	342	1326
12:45 PM	0	0	0	0	0	0	0	0	0	176	0	0	0	174	0	0	350	1332
1:00 PM	0	0	0	0	0	0	0	0	0	192	0	0	0	164	0	0	356	1366
1:15 PM	0	0	0	0	0	0	0	0	0	190	0	0	0	173	0	0	363	1411
1:30 PM	0	0	0	0	0	0	0	0	0	174	0	0	0	149	0	0	323	1392
1:45 PM	0	0	0	0	0	0	0	0	0	157	0	0	0	169	0	0	326	1368
2:00 PM	0	0	0	0	0	0	0	0	0	171	0	0	0	166	0	0	337	1349
2:15 PM	0	0	0	0	0	0	0	0	0	178	0	0	0	165	0	0	343	1329
2:30 PM	0	0	0	0	0	0	0	0	0	180	0	0	0	163	0	0	343	1349
2:45 PM	0	0	0	0	0	0	0	0	0	195	0	0	0	173	0	0	368	1391
3:00 PM	0	0	0	0	0	0	0	0	0	185	0	0	0	174	0	0	359	1413
3:15 PM	0	0	0	0	0	0	0	0	0	190	0	0	0	145	0	0	335	1405
3:30 PM	0	0	0	0	0	0	0	0	0	183	0	0	0	154	0	0	337	1399
3:45 PM	0	0	0	0	0	0	0	0	0	169	0	0	0	172	0	0	341	1372
4:00 PM	0	0	0	0	0	0	0	0	0	161	0	0	0	159	0	0	320	1333
4:15 PM	0	0	0	0	0	0	0	0	0	184	0	0	0	187	0	0	371	1369
4:30 PM	0	0	0	0	0	0	0	0	0	179	0	0	0	169	0	0	348	1380
4:45 PM	0	0	0	0	0	0	0	0	0	158	0	0	0	185	0	0	343	1382

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	0	0	0	0	0	0	0	0	0	780	0	0	0	692	0	0	1472
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	12	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 1/28/2020 4:35 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

1/22/2020

Eastbound	1	2	3	4	5	6	7	8	9	10	
	12:03 PM	12:32 PM	1:16 PM	2:00 PM	2:44 PM	3:34 PM	4:10 PM				
Route 99 & Route 83	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00				
Kamehameha Highway	0:02:47	0:02:33	0:02:12	0:02:18	0:02:34	0:02:19	0:02:45				
Kawailoa Drive	0:03:37	0:03:29	0:03:08	0:03:12	0:03:32	0:03:07	0:03:40				
First House	0:04:13	0:04:10	0:03:51	0:03:53	0:04:15	0:05:15	0:04:20				
Papailoa Drive	0:05:47	0:05:47	0:04:06	0:04:23	0:04:31	0:07:03	0:05:05				
Kawailoa Ranch	0:06:36	0:07:03	0:04:21	0:05:36	0:05:58	0:08:40	0:06:22				
Laniakea Bridge	0:08:11	0:07:47	0:04:40	0:06:53	0:07:27	0:09:51	0:07:41				
Pohaku Loa Way W	0:09:45	0:08:53	0:05:20	0:08:12	0:08:07	0:10:49	0:08:39				
Pohaku Loa Way E	0:10:09	0:09:11	0:05:41	0:08:34	0:08:26	0:11:17	0:09:01				
Ashley Road	0:10:36	0:09:31	0:06:11	0:09:06	0:08:51	0:11:47	0:09:34				
Waimea Bridge	0:13:43	0:13:07	0:09:25	0:12:51	0:35:06	0:16:50	0:13:06				
	0:04:25	0:03:33		0:02:52	0:02:47	0:05:29	0:03:19				

Westbound	1	2	3	4	5	6	7	8	9	10	
	12:19 PM	12:47 PM	1:27 PM	2:14 PM	3:21 PM	3:52 PM	4:24 PM				
Waimea Bridge	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00				
Ashley Road	0:02:59	0:03:16	0:03:39	0:03:25	0:03:37	0:06:05	0:07:59				
Pohaku Loa Way E	0:03:24	0:04:02	0:04:21	0:03:57	0:04:06	0:07:46					
Pohaku Loa Way W	0:04:44	0:04:24	0:05:19	0:04:21	0:04:42	0:09:12	0:11:03				
Laniakea Bridge	0:05:16	0:05:04	0:06:23	0:05:13	0:05:25	0:10:00	0:11:43				
Kawailoa Ranch	0:05:35	0:05:22	0:06:46	0:05:36	0:05:48	0:10:22	0:11:59				
Papailoa Drive	0:05:50	0:05:37	0:07:00	0:05:53	0:06:06	0:10:38	0:12:12				
Last House	0:06:05	0:05:51		0:06:10	0:06:20	0:10:54	0:12:25				
Kawailoa Drive	0:06:39	0:06:25	0:07:49	0:06:46	0:06:58	0:11:35	0:13:01				
Kamehameha Highway	0:07:57	0:07:14	0:08:48	0:07:56	0:08:03	0:12:28	0:14:00				
Route 99 & Route 83	0:10:29	0:09:37	0:11:11	0:10:26	0:10:45	0:15:10	0:16:44				

Notes:

1 Good weather, good surf. Ranch area almost full, beach full. Lots of peds. BoQ around 1st house
2 EB BoQ around 1st house.
3 No EB Queue
4 EB BoQ around Papailoa, ranch parking cleared out a lot
5 EB BoQ around Papailoa, good surf, lots of EB congestion from beyond Waimea

7 EB BoQ around Papailoa, Beach parking clearing out

1 Parking area not completely full, some double parking. WB BoQ between Pohakuloa streets.

3 Parallel parked shuttle at beach. Last house checkpoint missed, but moving 40 mph

5 EB BoQ at last house
6 Ample parking available at Laniakea, EB BoQ at last bendto the right

1/25/2020

	1	2	3	4	5	6	7	8	9	10	
Eastbound	10:10 AM	11:06 AM	11:40 AM	12:15 PM	1:04 PM	2:01 PM	3:01 PM	4:13 PM			
Route 99 & Route 83	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00			
Kamehameha Highway	0:02:18	0:02:23	0:03:01	0:09:32	0:10:03	0:14:48	0:12:58	0:02:37			
Kawailoa Drive	0:03:10	0:03:15	0:05:04	0:14:37	0:17:50	0:20:18	0:17:58	0:05:12			
First House	0:03:42	0:03:54	0:09:24	0:17:56	0:22:42	0:25:14	0:21:18				
Papailoa Drive	0:03:57	0:04:10	0:10:11	0:19:10	0:24:28	0:26:34	0:22:46	0:10:04			
Kawailoa Ranch	0:04:12	0:04:28	0:11:25	0:20:07	0:25:09	0:27:34	0:23:31	0:10:54			
Laniakea Bridge	0:04:27	0:05:15	0:12:14	0:21:08	0:26:08	0:28:59	0:24:20	0:12:04			
Pohaku Loa Way W	0:05:04	0:05:53	0:13:09	0:22:12	0:26:52	0:30:02	0:25:19	0:12:44			
Pohaku Loa Way E	0:05:22	0:06:12	0:13:31	0:22:31	0:27:08	0:30:19	0:25:38	0:13:04			
Ashley Road	0:05:41	0:06:50	0:13:59	0:22:52	0:27:33	0:30:41	0:25:59				
Waimea Bridge	0:09:20	0:10:35	0:18:07	0:26:12	0:31:36	0:34:26	0:29:36	0:21:30			
		0:00:49	0:08:05	0:17:08	0:21:48	0:24:58	0:20:15	0:07:40			
	1	2	3	4	5	6	7	8	9	10	
Westbound	10:20 AM	11:18 AM	12:01 PM	12:42 PM	1:39 PM	2:39 PM	3:32 PM	4:37 PM			
Waimea Bridge	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00			
Ashley Road	0:04:10	0:04:42	0:04:23	0:04:31	0:03:58	0:03:35	0:03:54	0:06:15			
Pohaku Loa Way E	0:04:33	0:05:06	0:04:51	0:04:53	0:04:24	0:04:02	0:04:50	0:08:12			
Pohaku Loa Way W	0:04:52	0:05:26	0:05:13	0:05:11	0:04:45	0:04:38	0:06:27	0:09:40			
Laniakea Bridge	0:05:18	0:06:38	0:05:53	0:05:42	0:05:07	0:05:55	0:07:16	0:10:42			
Kawailoa Ranch	0:05:37	0:06:55	0:06:13	0:06:02	0:05:34	0:06:23		0:11:00			
Papailoa Drive	0:05:52	0:07:11	0:06:32	0:06:18	0:05:50	0:06:40	0:07:50	0:11:16			
Last House	0:06:05	0:07:25	0:06:52	0:06:34			0:08:06	0:11:30			
Kawailoa Drive	0:06:47	0:08:01	0:07:39	0:07:15	0:06:44		0:08:41	0:12:21			
Kamehameha Highway	0:08:07	0:08:53	0:09:28	0:09:01	0:07:46	0:08:48	0:09:36	0:13:14			
Route 99 & Route 83	0:10:56	0:11:28	0:12:10	0:11:43	0:10:37	0:11:23	0:12:45	0:15:40			

Notes:

1. some drizzle, mostly clear, ranch parking empty, high surf

3. some parking at ranch (~5), BoQ at Welcome to Haleiwa sign, ample parking at beach
4. EB BoQ at 2nd bridge beyond Tsue Farm
5. clear weather now, 4 cars at ranch, BoQ at bridge/Tsue's farm
6. EB BoQ at bridge/Tsue's farm

8. Queue is closer to Kawailoa Drive now

2. part of beach caution taped off, peds ignoring it

5. 35 mph at papailoa
6. Laniakea parking filling up
7. 14 ranch parking

APPENDIX B LEVEL OF SERVICE DEFINITIONS

The 2000 Highway Capacity Manual defines six Intersection Levels of Service (LOS), labeled A through F, from free flow to congested conditions.

For unsignalized intersections, the Highway Capacity Manual evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street. Average control delay, based on these factors, is still used to define the levels of service.

LEVEL OF SERVICE A: Low control delay, up to 10 s/veh.

LEVEL OF SERVICE B: Control delay greater than 10 and up to 15 s/veh.

LEVEL OF SERVICE C: Control delay greater than 15 and up to 25 s/veh.

LEVEL OF SERVICE D: Control delay greater than 25 and up to 35 s/veh.

LEVEL OF SERVICE E: Control delay greater than 35 and up to 50 s/veh.

LEVEL OF SERVICE F: Control delay in excess of 50 s/veh.

APPENDIX C SIMTRAFFIC ANALYSIS WORKSHEETS

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	9.2	77.1	0.85	39.6	A
Haleiwa	II	45	149.6	6.1	155.7	1.87	43.2	A
	II	35	142.9	12.0	154.9	1.39	32.3	B
	II	35	13.1	5.1	18.2	0.10	20.8	D
	II	35	231.0	11.0	242.0	2.25	33.4	B
Total	II		604.5	43.4	647.9	6.46	35.9	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	12.5	42.6	0.25	21.4	D
	II	35	231.0	10.6	241.6	2.25	33.5	B
	II	35	13.1	4.7	17.8	0.10	21.2	D
Haleiwa	II	35	142.9	17.3	160.2	1.39	31.2	B
Haleiwa/Waialua	II	45	149.6	11.0	160.6	1.87	41.9	A
Total	II		566.7	56.1	622.8	5.86	33.9	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	15.0	82.9	0.85	36.9	A
Haleiwa	II	45	149.6	8.5	158.1	1.87	42.6	A
	II	35	142.9	20.2	163.1	1.39	30.7	B
	II	35	13.1	7.0	20.1	0.10	18.8	D
	II	35	231.0	11.0	242.0	2.25	33.4	B
Total	II		604.5	61.7	666.2	6.46	34.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	12.5	42.6	0.25	21.4	D
	II	35	231.0	11.3	242.3	2.25	33.4	B
	II	35	13.1	4.9	18.0	0.10	21.0	D
Haleiwa	II	35	142.9	22.9	165.8	1.39	30.2	B
Haleiwa/Waialua	II	45	149.6	15.6	165.2	1.87	40.7	A
Total	II		566.7	67.2	633.9	5.86	33.3	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	15.1	83.0	0.85	36.8	A
Haleiwa	II	45	149.6	8.6	158.2	1.87	42.5	A
	II	35	142.9	116.8	259.7	1.39	19.3	D
	II	35	13.1	104.5	117.6	0.10	3.2	F
	II	35	231.0	11.2	242.2	2.25	33.4	B
Total	II		604.5	256.2	860.7	6.46	27.0	C

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.8	41.9	0.25	21.7	D
	II	35	231.0	25.8	256.8	2.25	31.5	B
	II	35	13.1	31.0	44.1	0.10	8.6	F
Haleiwa	II	35	142.9	21.0	163.9	1.39	30.5	B
Haleiwa/Waialua	II	45	149.6	14.3	163.9	1.87	41.1	A
Total	II		566.7	103.9	670.6	5.86	31.5	B

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	19	5.9	67.5	0.8	42
Haleiwa/Waialua	1	11.7	17.4	0.1	14
	4	3.7	11.6	0.1	31
	5	2.7	33.0	0.4	42
	6	8.5	82.7	0.9	41
Haleiwa	8	11.7	47.3	0.4	34
	10	2.1	15.7	0.1	31
	20	23.7	46.3	0.2	17
	31	111.5	130.7	0.2	5
	30	350.2	385.8	0.4	4
	29	156.3	171.2	0.2	3
	28	150.7	165.4	0.1	3
	9	148.2	163.2	0.2	3
	26	37.8	48.4	0.1	8
	11	3.1	8.0	0.0	21
	12	1.9	22.2	0.2	32
	13	7.4	68.3	0.6	32
	14	12.0	103.4	0.9	32
	15	2.4	19.9	0.2	31
	16	5.1	33.0	0.3	30
	22	8.5	12.9	0.0	13
	24	1.9	6.3	0.0	24
Total		1067.2	1660.2	6.5	14

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	24	5.2	27.0	0.2	29
	22	13.6	17.6	0.0	9
	16	2.1	6.9	0.0	23
	15	2.2	30.4	0.3	32
	14	1.7	19.2	0.2	32
	13	10.5	103.7	0.9	32
	12	7.7	68.7	0.6	31
	11	6.8	27.4	0.2	26
	26	17.1	22.0	0.0	8
	9	26.5	37.3	0.1	10
	28	4.3	20.2	0.2	27
	29	1.7	17.2	0.1	31
	30	1.9	17.8	0.2	31
	31	5.2	44.7	0.4	31
	20	2.7	22.7	0.2	30
	10	3.2	26.2	0.2	30
Haleiwa	8	21.2	35.2	0.1	14
	6	7.8	44.7	0.4	36
	5	9.1	83.4	0.9	40
	4	5.0	35.8	0.4	39
Haleiwa/Waialua	1	16.2	24.1	0.1	15
	19	4.1	10.0	0.1	25
Total		175.8	742.2	5.9	29

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.6	74.5	0.85	41.0	A
Haleiwa	II	45	149.6	6.7	156.3	1.87	43.1	A
	II	35	142.9	25.5	168.4	1.39	29.7	B
	II	35	13.1	27.4	40.5	0.10	9.3	F
	II	35	231.0	7.1	238.1	2.25	34.0	B
Total	II		604.5	73.3	677.8	6.46	34.3	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.4	41.5	0.25	21.9	D
	II	35	231.0	21.8	252.8	2.25	32.0	B
	II	35	13.1	28.0	41.1	0.10	9.2	F
Haleiwa	II	35	142.9	22.2	165.1	1.39	30.3	B
Haleiwa/Waialua	II	45	149.6	8.3	157.9	1.87	42.6	A
Total	II		566.7	91.7	658.4	5.86	32.1	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	12.1	80.0	0.85	38.2	A
Haleiwa	II	45	149.6	10.5	160.1	1.87	42.0	A
	II	35	142.9	218.2	361.1	1.39	13.9	E
	II	35	13.1	209.0	222.1	0.10	1.7	F
	II	35	231.0	15.1	246.1	2.25	32.8	B
Total	II		604.5	464.9	1069.4	6.46	21.7	D

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	63.6	93.7	0.25	9.7	F
	II	35	231.0	136.4	367.4	2.25	22.0	C
	II	35	13.1	127.1	140.2	0.10	2.7	F
Haleiwa	II	35	142.9	37.7	180.6	1.39	27.7	C
Haleiwa/Waialua	II	45	149.6	11.5	161.1	1.87	41.8	A
Total	II		566.7	376.3	943.0	5.86	22.4	C

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	14.1	82.0	0.85	37.3	A
Haleiwa	II	45	149.6	11.9	161.5	1.87	41.7	A
	II	35	142.9	272.1	415.0	1.39	12.1	F
	II	35	13.1	265.8	278.9	0.10	1.4	F
	II	35	231.0	19.1	250.1	2.25	32.3	B
Total	II		604.5	583.0	1187.5	6.46	19.6	D

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	162.2	192.3	0.25	4.7	F
	II	35	231.0	97.0	328.0	2.25	24.6	C
	II	35	13.1	98.2	111.3	0.10	3.4	F
Haleiwa	II	35	142.9	42.7	185.6	1.39	27.0	C
Haleiwa/Waialua	II	45	149.6	12.1	161.7	1.87	41.6	A
Total	II		566.7	412.2	978.9	5.86	21.6	D

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.4	74.3	0.85	41.1	A
Haleiwa	II	45	149.6	6.5	156.1	1.87	43.1	A
	II	35	153.7	4.7	158.4	1.49	34.0	B
	II	35	231.0	6.9	237.9	2.25	34.0	B
Total	II		602.2	24.5	626.7	6.46	37.1	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.1	41.2	0.25	22.1	C
	II	35	231.0	6.5	237.5	2.25	34.0	B
Haleiwa	II	35	153.7	21.1	174.8	1.49	30.8	B
Haleiwa/Waialua	II	45	149.6	8.0	157.6	1.87	42.7	A
Total	II		564.4	46.7	611.1	5.86	34.5	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	11.5	79.4	0.85	38.5	A
Haleiwa	II	45	149.6	10.0	159.6	1.87	42.2	A
	II	35	153.7	8.8	162.5	1.49	33.1	B
	II	35	231.0	14.4	245.4	2.25	32.9	B
Total	II		602.2	44.7	646.9	6.46	35.9	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	47.2	77.3	0.25	11.8	F
	II	35	231.0	8.5	239.5	2.25	33.8	B
Haleiwa	II	35	153.7	33.6	187.3	1.49	28.7	B
Haleiwa/Waialua	II	45	149.6	11.0	160.6	1.87	41.9	A
Total	II		564.4	100.3	664.7	5.86	31.8	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	12.7	80.6	0.85	37.9	A
Haleiwa	II	45	149.6	10.9	160.5	1.87	41.9	A
	II	35	153.7	9.8	163.5	1.49	32.9	B
	II	35	231.0	16.4	247.4	2.25	32.7	B
Total	II		602.2	49.8	652.0	6.46	35.7	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	95.9	126.0	0.25	7.2	F
	II	35	231.0	9.0	240.0	2.25	33.7	B
Haleiwa	II	35	153.7	38.9	192.6	1.49	27.9	C
Haleiwa/Waialua	II	45	149.6	11.7	161.3	1.87	41.7	A
Total	II		564.4	155.5	719.9	5.86	29.3	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.6	74.5	0.85	41.0	A
Haleiwa	II	45	149.6	6.7	156.3	1.87	43.1	A
	II	35	143.6	4.9	148.5	1.40	33.9	B
	II	35	15.9	4.8	20.7	0.13	22.1	C
	II	35	228.2	7.1	235.3	2.22	33.9	B
Total	II		605.2	30.1	635.3	6.46	36.6	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.4	41.5	0.25	21.9	D
	II	35	228.2	6.6	234.8	2.22	34.0	B
	II	35	15.9	7.5	23.4	0.13	19.6	D
Haleiwa	II	35	143.6	22.2	165.8	1.40	30.3	B
Haleiwa/Waialua	II	45	149.6	8.3	157.9	1.87	42.6	A
Total	II		567.4	56.0	623.4	5.86	33.9	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	12.1	80.0	0.85	38.2	A
Haleiwa	II	45	149.6	10.5	160.1	1.87	42.0	A
	II	35	143.6	9.7	153.3	1.40	32.8	B
	II	35	15.9	13.7	29.6	0.13	15.5	E
	II	35	228.2	15.1	243.3	2.22	32.8	B
Total	II		605.2	61.1	666.3	6.46	34.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	63.6	93.7	0.25	9.7	F
	II	35	228.2	8.7	236.9	2.22	33.7	B
	II	35	15.9	12.2	28.1	0.13	16.3	E
Haleiwa	II	35	143.6	37.7	181.3	1.40	27.7	C
Haleiwa/Waialua	II	45	149.6	11.5	161.1	1.87	41.8	A
Total	II		567.4	133.7	701.1	5.86	30.1	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	14.1	82.0	0.85	37.3	A
Haleiwa	II	45	149.6	11.9	161.5	1.87	41.7	A
	II	35	143.6	12.2	155.8	1.40	32.3	B
	II	35	15.9	16.9	32.8	0.13	13.9	E
	II	35	228.2	19.1	247.3	2.22	32.3	B
Total	II		605.2	74.2	679.4	6.46	34.2	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	162.2	192.3	0.25	4.7	F
	II	35	228.2	9.1	237.3	2.22	33.7	B
	II	35	15.9	12.9	28.8	0.13	15.9	E
Haleiwa	II	35	143.6	42.7	186.3	1.40	27.0	C
Haleiwa/Waialua	II	45	149.6	12.1	161.7	1.87	41.6	A
Total	II		567.4	239.0	806.4	5.86	26.2	C

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.6	74.5	0.85	41.0	A
Haleiwa	II	45	149.6	6.7	156.3	1.87	43.1	A
	II	35	156.7	5.1	161.8	1.52	33.9	B
	II	35	228.2	7.1	235.3	2.22	33.9	B
Total	II		602.4	25.5	627.9	6.46	37.0	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.4	41.5	0.25	21.9	D
	II	35	228.2	6.6	234.8	2.22	34.0	B
Haleiwa	II	35	156.7	22.2	178.9	1.52	30.7	B
Haleiwa/Waialua	II	45	149.6	8.3	157.9	1.87	42.6	A
Total	II		564.6	48.5	613.1	5.86	34.4	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	12.1	80.0	0.85	38.2	A
Haleiwa	II	45	149.6	10.5	160.1	1.87	42.0	A
	II	35	156.7	10.4	167.1	1.52	32.8	B
	II	35	228.2	15.1	243.3	2.22	32.8	B
Total	II		602.4	48.1	650.5	6.46	35.8	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	63.6	93.7	0.25	9.7	F
	II	35	228.2	8.7	236.9	2.22	33.7	B
Haleiwa	II	35	156.7	37.7	194.4	1.52	28.2	B
Haleiwa/Waialua	II	45	149.6	11.5	161.1	1.87	41.8	A
Total	II		564.6	121.5	686.1	5.86	30.8	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	14.1	82.0	0.85	37.3	A
Haleiwa	II	45	149.6	11.9	161.5	1.87	41.7	A
	II	35	156.7	19.0	175.7	1.52	31.2	B
	II	35	228.2	19.1	247.3	2.22	32.3	B
Total	II		602.4	64.1	666.5	6.46	34.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	162.2	192.3	0.25	4.7	F
	II	35	228.2	9.1	237.3	2.22	33.7	B
Haleiwa	II	35	156.7	42.7	199.4	1.52	27.5	C
Haleiwa/Waialua	II	45	149.6	12.1	161.7	1.87	41.6	A
Total	II		564.6	226.1	790.7	5.86	26.7	C

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.6	74.5	0.85	41.0	A
Haleiwa	II	45	149.6	6.7	156.3	1.87	43.1	A
	II	35	143.9	5.1	149.0	1.40	33.8	B
	II	35	244.8	7.1	251.9	2.38	34.0	B
Total	II		606.2	25.5	631.7	6.50	37.0	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	11.4	41.5	0.25	21.9	D
	II	35	244.8	6.6	251.4	2.38	34.1	B
Haleiwa	II	35	143.9	22.2	166.1	1.40	30.3	B
Haleiwa/Waialua	II	45	149.6	8.3	157.9	1.87	42.6	A
Total	II		568.4	48.5	616.9	5.90	34.4	B

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	12.1	80.0	0.85	38.2	A
Haleiwa	II	45	149.6	10.5	160.1	1.87	42.0	A
	II	35	143.9	10.4	154.3	1.40	32.6	B
	II	35	244.8	15.1	259.9	2.38	33.0	B
Total	II		606.2	48.1	654.3	6.50	35.7	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	63.6	93.7	0.25	9.7	F
	II	35	244.8	8.7	253.5	2.38	33.8	B
Haleiwa	II	35	143.9	37.7	181.6	1.40	27.7	C
Haleiwa/Waialua	II	45	149.6	11.5	161.1	1.87	41.8	A
Total	II		568.4	121.5	689.9	5.90	30.8	B

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	14.1	82.0	0.85	37.3	A
Haleiwa	II	45	149.6	11.9	161.5	1.87	41.7	A
	II	35	143.9	19.0	162.9	1.40	30.9	B
	II	35	244.8	19.1	263.9	2.38	32.5	B
Total	II		606.2	64.1	670.3	6.50	34.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	162.2	192.3	0.25	4.7	F
	II	35	244.8	9.1	253.9	2.38	33.7	B
Haleiwa	II	35	143.9	42.7	186.6	1.40	27.0	C
Haleiwa/Waialua	II	45	149.6	12.1	161.7	1.87	41.6	A
Total	II		568.4	226.1	794.5	5.90	26.7	C

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.9	74.8	0.85	40.9	A
Haleiwa	II	45	149.6	7.1	156.7	1.87	43.0	A
	II	35	142.9	32.4	175.3	1.39	28.5	B
	II	35	13.1	30.9	44.0	0.10	8.6	F
	II	35	231.0	7.8	238.8	2.25	33.9	B
Total	II		604.5	85.1	689.6	6.46	33.7	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	15.7	45.8	0.25	19.9	D
	II	35	231.0	36.1	267.1	2.25	30.3	B
	II	35	13.1	34.7	47.8	0.10	7.9	F
Haleiwa	II	35	142.9	29.6	172.5	1.39	29.0	B
Haleiwa/Waialua	II	45	149.6	9.4	159.0	1.87	42.3	A
Total	II		566.7	125.5	692.2	5.86	30.5	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	16.9	84.8	0.85	36.0	A
Haleiwa	II	45	149.6	13.1	162.7	1.87	41.4	A
	II	35	142.9	337.8	480.7	1.39	10.4	F
	II	35	13.1	330.3	343.4	0.10	1.1	F
	II	35	231.0	26.6	257.6	2.25	31.4	B
Total	II		604.5	724.7	1329.2	6.46	17.5	D

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	587.3	617.4	0.25	1.5	F
	II	35	231.0	239.4	470.4	2.25	17.2	D
	II	35	13.1	230.1	243.2	0.10	1.6	F
Haleiwa	II	35	142.9	83.2	226.1	1.39	22.1	C
Haleiwa/Waialua	II	45	149.6	15.5	165.1	1.87	40.8	A
Total	II		566.7	1155.5	1722.2	5.86	12.3	F

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	21.1	89.0	0.85	34.3	B
Haleiwa	II	45	149.6	15.4	165.0	1.87	40.8	A
	II	35	142.9	387.5	530.4	1.39	9.4	F
	II	35	13.1	382.2	395.3	0.10	1.0	F
	II	35	231.0	38.7	269.7	2.25	30.0	B
Total	II		604.5	844.9	1449.4	6.46	16.0	E

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	1345.6	1375.7	0.25	0.7	F
	II	35	231.0	182.2	413.2	2.25	19.6	D
	II	35	13.1	188.2	201.3	0.10	1.9	F
Haleiwa	II	35	142.9	90.3	233.2	1.39	21.5	D
Haleiwa/Waialua	II	45	149.6	16.1	165.7	1.87	40.6	A
Total	II		566.7	1822.4	2389.1	5.86	8.8	F

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.7	74.6	0.85	41.0	A
Haleiwa	II	45	149.6	6.8	156.4	1.87	43.0	A
	II	35	153.7	5.1	158.8	1.49	33.9	B
	II	35	231.0	7.6	238.6	2.25	33.9	B
Total	II		602.2	26.2	628.4	6.46	37.0	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	15.0	45.1	0.25	20.2	D
	II	35	231.0	7.9	238.9	2.25	33.8	B
Haleiwa	II	35	153.7	27.3	181.0	1.49	29.7	B
Haleiwa/Waialua	II	45	149.6	9.1	158.7	1.87	42.4	A
Total	II		564.4	59.3	623.7	5.86	33.8	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	15.6	83.5	0.85	36.6	A
Haleiwa	II	45	149.6	12.3	161.9	1.87	41.6	A
	II	35	153.7	12.8	166.5	1.49	32.3	B
	II	35	231.0	24.2	255.2	2.25	31.7	B
Total	II		602.2	64.9	667.1	6.46	34.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	484.1	514.2	0.25	1.8	F
	II	35	231.0	11.9	242.9	2.25	33.3	B
Haleiwa	II	35	153.7	71.9	225.6	1.49	23.9	C
Haleiwa/Waialua	II	45	149.6	14.5	164.1	1.87	41.0	A
Total	II		564.4	582.4	1146.8	5.86	18.4	D

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	17.8	85.7	0.85	35.7	A
Haleiwa	II	45	149.6	13.6	163.2	1.87	41.2	A
	II	35	153.7	14.7	168.4	1.49	32.0	B
	II	35	231.0	29.9	260.9	2.25	31.0	B
Total	II		602.2	76.0	678.2	6.46	34.3	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	754.1	784.2	0.25	1.2	F
	II	35	231.0	12.6	243.6	2.25	33.2	B
Haleiwa	II	35	153.7	81.6	235.3	1.49	22.9	C
Haleiwa/Waialua	II	45	149.6	15.3	164.9	1.87	40.8	A
Total	II		564.4	863.6	1428.0	5.86	14.8	E

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.9	74.8	0.85	40.9	A
Haleiwa	II	45	149.6	7.1	156.7	1.87	43.0	A
	II	35	143.6	5.4	149.0	1.40	33.7	B
	II	35	15.9	5.3	21.2	0.13	21.6	D
	II	35	228.2	7.8	236.0	2.22	33.8	B
Total	II		605.2	32.5	637.7	6.46	36.5	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	15.7	45.8	0.25	19.9	D
	II	35	228.2	8.2	236.4	2.22	33.8	B
	II	35	15.9	10.9	26.8	0.13	17.1	D
Haleiwa	II	35	143.6	29.6	173.2	1.40	29.0	B
Haleiwa/Waialua	II	45	149.6	9.4	159.0	1.87	42.3	A
Total	II		567.4	73.8	641.2	5.86	32.9	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	16.9	84.8	0.85	36.0	A
Haleiwa	II	45	149.6	13.1	162.7	1.87	41.4	A
	II	35	143.6	14.9	158.5	1.40	31.7	B
	II	35	15.9	19.6	35.5	0.13	12.9	F
	II	35	228.2	26.6	254.8	2.22	31.4	B
Total	II		605.2	91.1	696.3	6.46	33.4	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	587.3	617.4	0.25	1.5	F
	II	35	228.2	12.4	240.6	2.22	33.2	B
	II	35	15.9	17.7	33.6	0.13	13.6	E
Haleiwa	II	35	143.6	83.2	226.8	1.40	22.2	C
Haleiwa/Waialua	II	45	149.6	15.5	165.1	1.87	40.8	A
Total	II		567.4	716.1	1283.5	5.86	16.4	E

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	21.1	89.0	0.85	34.3	B
Haleiwa	II	45	149.6	15.4	165.0	1.87	40.8	A
	II	35	143.6	32.3	175.9	1.40	28.6	B
	II	35	15.9	27.2	43.1	0.13	10.6	F
	II	35	228.2	38.7	266.9	2.22	29.9	B
Total	II		605.2	134.7	739.9	6.46	31.4	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	1345.6	1375.7	0.25	0.7	F
	II	35	228.2	12.9	241.1	2.22	33.1	B
	II	35	15.9	18.5	34.4	0.13	13.3	E
Haleiwa	II	35	143.6	90.3	233.9	1.40	21.5	D
Haleiwa/Waialua	II	45	149.6	16.1	165.7	1.87	40.6	A
Total	II		567.4	1483.4	2050.8	5.86	10.3	F

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.9	74.8	0.85	40.9	A
Haleiwa	II	45	149.6	7.1	156.7	1.87	43.0	A
	II	35	156.7	5.7	162.4	1.52	33.8	B
	II	35	228.2	7.8	236.0	2.22	33.8	B
Total	II		602.4	27.5	629.9	6.46	36.9	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	15.7	45.8	0.25	19.9	D
	II	35	228.2	8.2	236.4	2.22	33.8	B
Haleiwa	II	35	156.7	29.6	186.3	1.52	29.4	B
Haleiwa/Waialua	II	45	149.6	9.4	159.0	1.87	42.3	A
Total	II		564.6	62.9	627.5	5.86	33.6	B

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	16.9	84.8	0.85	36.0	A
Haleiwa	II	45	149.6	13.1	162.7	1.87	41.4	A
	II	35	156.7	24.3	181.0	1.52	30.3	B
	II	35	228.2	26.6	254.8	2.22	31.4	B
Total	II		602.4	80.9	683.3	6.46	34.0	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	587.3	617.4	0.25	1.5	F
	II	35	228.2	12.4	240.6	2.22	33.2	B
Haleiwa	II	35	156.7	83.2	239.9	1.52	22.9	C
Haleiwa/Waialua	II	45	149.6	15.5	165.1	1.87	40.8	A
Total	II		564.6	698.4	1263.0	5.86	16.7	E

Arterial Level of Service: NE Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	21.1	89.0	0.85	34.3	B
Haleiwa	II	45	149.6	15.4	165.0	1.87	40.8	A
	II	35	156.7	128.3	285.0	1.52	19.2	D
	II	35	228.2	38.7	266.9	2.22	29.9	B
Total	II		602.4	203.5	805.9	6.46	28.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	1345.6	1375.7	0.25	0.7	F
	II	35	228.2	12.9	241.1	2.22	33.1	B
Haleiwa	II	35	156.7	90.3	247.0	1.52	22.2	C
Haleiwa/Waialua	II	45	149.6	16.1	165.7	1.87	40.6	A
Total	II		564.6	1464.9	2029.5	5.86	10.4	F

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	6.9	74.8	0.85	40.9	A
Haleiwa	II	45	149.6	7.1	156.7	1.87	43.0	A
	II	35	143.9	5.7	149.6	1.40	33.7	B
	II	35	244.8	7.8	252.6	2.38	33.9	B
Total	II		606.2	27.5	633.7	6.50	36.9	A

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	15.7	45.8	0.25	19.9	D
	II	35	244.8	8.2	253.0	2.38	33.9	B
Haleiwa	II	35	143.9	29.6	173.5	1.40	29.0	B
Haleiwa/Waialua	II	45	149.6	9.4	159.0	1.87	42.3	A
Total	II		568.4	62.9	631.3	5.90	33.6	B

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	16.9	84.8	0.85	36.0	A
Haleiwa	II	45	149.6	13.1	162.7	1.87	41.4	A
	II	35	143.9	24.3	168.2	1.40	29.9	B
	II	35	244.8	26.6	271.4	2.38	31.6	B
Total	II		606.2	80.9	687.1	6.50	34.0	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	587.3	617.4	0.25	1.5	F
	II	35	244.8	12.4	257.2	2.38	33.3	B
Haleiwa	II	35	143.9	83.2	227.1	1.40	22.2	C
Haleiwa/Waialua	II	45	149.6	15.5	165.1	1.87	40.8	A
Total	II		568.4	698.4	1266.8	5.90	16.8	E

Arterial Level of Service: NB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Haleiwa/Waialua	II	45	67.9	21.1	89.0	0.85	34.3	B
Haleiwa	II	45	149.6	15.4	165.0	1.87	40.8	A
	II	35	143.9	128.3	272.2	1.40	18.5	D
	II	35	244.8	38.7	283.5	2.38	30.2	B
Total	II		606.2	203.5	809.7	6.50	28.9	B

Arterial Level of Service: SB Kamehameha Highway

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	30.1	1345.6	1375.7	0.25	0.7	F
	II	35	244.8	12.9	257.7	2.38	33.2	B
Haleiwa	II	35	143.9	90.3	234.2	1.40	21.5	D
Haleiwa/Waialua	II	45	149.6	16.1	165.7	1.87	40.6	A
Total	II		568.4	1464.9	2033.3	5.90	10.4	F

Appendix

C

Shoreline Certification

DAVID Y. IGE
GOVERNOR OF HAWAII

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

LAND SURVEY DIV.
2020 AUG -3 A 11:42

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

August 3, 2020

File No.: OA-1889

WSP USA Inc.
c/o Nami Ohtomo
1001 Bishop Street, Suite 2400
Honolulu, Hawaii 96813

Dear Applicant:

Subject: Transmittal of Signed Shoreline Certification Maps
Owner(s): State of Hawaii, Department of Transportation
Tax Map Key: (1) 6-1-009:021 & 022; (1) 6-1-010:019 & 020; (1) 6-1-005:023

Enclosed please find three (3) copies of the certified shoreline survey maps for the subject property.

If you have any questions, please feel free to call us at (808) 587-0424. Thank you.

Sincerely,

Cal Miyahara

Cal Miyahara
Shoreline Disposition Specialist

Enclosures

cc: DAGS


1


2


3


4


5


6


7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9


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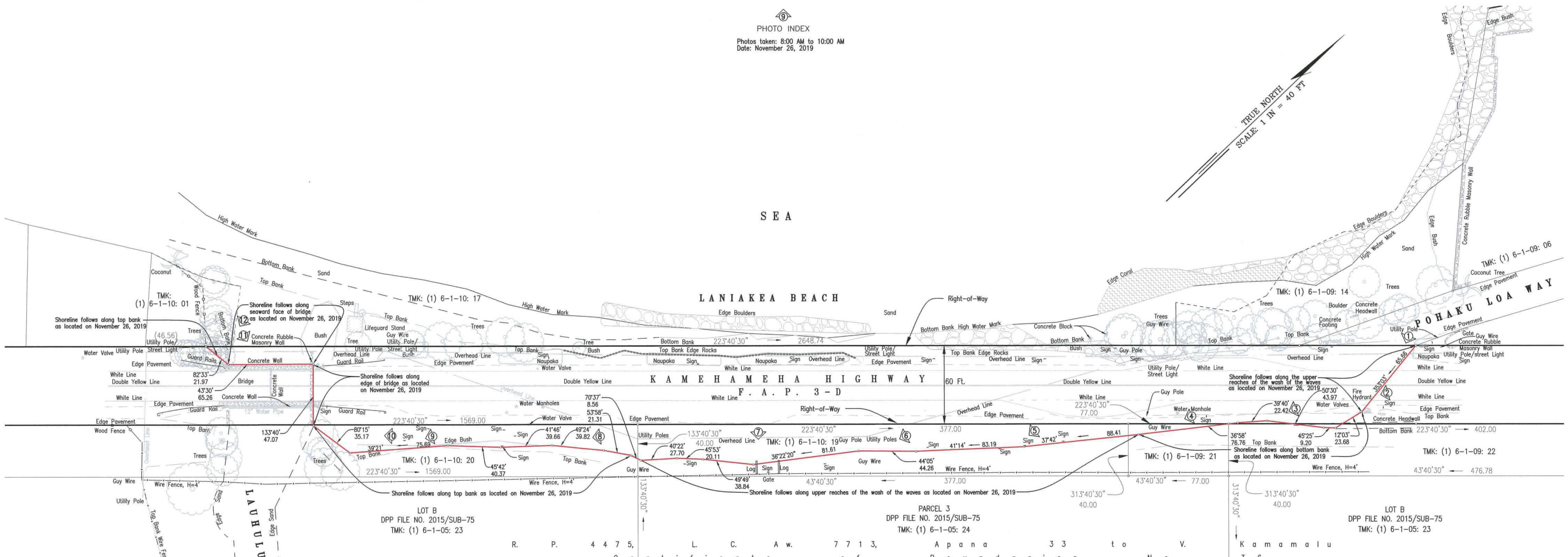
11


12

PHOTO INDEX

Photos taken: 8:00 AM to 10:00 AM
Date: November 26, 2019



NOTE:

9 Photo number and direction

SHORELINE SURVEY MAP

PORTIONS OF KAMEHAMEHA HIGHWAY, F.A.P. 3-D,
FORMER RAILROAD RIGHT-OF-WAY (40-FT. WIDE) AND
PARCEL 3 AND LOT B, OF DPP FILE NO. 2015/SUB-75,
BEING PORTIONS OF R.P. 4475, L.C. AW. 7713, APANA 33 TO V. KAMAMALU
KAWAILOA, WAIALUA, OAHU, HAWAII

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 Inch = 40 Feet

Owner:

City & County of Honolulu	Bishop Estate
(1) 6-1-09: 21	(1) 6-1-09: 22
(1) 6-1-10: 19	(1) 6-1-10: 20
(1) 6-1-05: 23	
(1) 6-1-05: 24	

Property Address:

(1) 6-1-09: 21	Pohaku Loa Way
(1) 6-1-09: 22	Pohaku Loa Way
(1) 6-1-10: 19	Kamehameha Hwy
(1) 6-1-10: 20	61-610 Kamehameha Hwy
(1) 6-1-05: 23	61-184 Kawailoa Drive
(1) 6-1-05: 24	Kamehameha Highway

The shoreline as delineated in red is hereby certified as the shoreline as of JUL 30 2020

Chairperson, Board of Land and Natural Resources

RICO D. EROLIN
LICENSED PROFESSIONAL LAND SURVEYOR
No. 9325
HAWAII, U.S.A.

This work was prepared by me or under my direct supervision.

Rico D. Erolin
Licensed Professional Land Surveyor
Certificate Number 9325-LS
License Expires April 30, 2022

Telephone: (808) 591-2022
Email: rerolin@cpshawaii.net

File: N:\SHORELINE\2016\000\16009-02-2\dwg\16009-02-2_Rev_Shoreline.dwg

TMK: (1) 6-1-10: 19 and 20, (1) 6-1-09: 21 & 22, and (1) 6-1-05: 23 & 24
Job No.: 16009-02-2
F.B. No.: 3491B

CONTROLPOINT SURVEYING, INC.
615 Piikoi Street, Suite 700
HONOLULU, HAWAII 96814

SURVEY OFFICE COPY

36"x24"=6.0 Sq. Ft.
Plot: December 24, 2019
Field Work: November 26, 2019
Updated: June 15, 2020

Appendix

D

Coastal Engineering Assessment

Coastal Engineering Assessment for the Kamehameha Highway Pedestrian Safety Realignment at Laniakea Beach

Haleiwa, Island of Oahu, Hawaii

April 2021

Prepared for:
WSP
1001 Bishop St., American Savings Bank Tower, Suite 2400
Honolulu, Hawaii 96813

Prepared by:
Sea Engineering, Inc.
Makai Research Pier
Waimanalo, HI 96795

Job No. 25743

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

(blank page)

1. INTRODUCTION

1.1 Background

The State of Hawaii Department of Transportation, Highways Division (HDOT) is proposing a realignment of Kamehameha Highway (Route 83) on the North Shore of Oahu. The realignment occurs at approximately Milepost 3.3 in the vicinity of Laniakea Beach. A basalt rock headland at this location divides the coastline and provides a sheltered cove used by Hawaiian Green Sea Turtles as a grazing area. The cove has become known as "Turtle Beach" and is a popular destination for tourists to closely observe the endangered species.

The popularity of the site for both turtle watching and surfing is such that the movement of vehicles in and out of parking, and the number of pedestrians crossing the road in an uncontrolled manner causes the traffic to slow considerably. Vehicles are commonly blocked all the way to Haleiwa town. The location is also relatively unprotected during high wave events, and overwash of the highway is not uncommon. Realignment of the highway was therefore proposed to both streamline the traffic flow and provide an additional buffer against damage to the highway from future wave events with the anticipation of sea level rise due to climate change. In August 2019 after a child was hit by a vehicle and severely injured, pedestrian safety became the major project focus.

1.2 Location

The project location on Oahu is shown in Figure 1-1; the beach and geographic landmarks are shown on the aerial photograph in Figure 1-2. The project reach is approximately 1,000 ft in length and lies at the north end of Laniakea Beach. Pu'u Nenue is a broad basalt headland that borders the north end of Laniakea Beach, and Pu'u Kolea is a broad sand point at the south end. The offshore area is known for high quality surf, with numerous well known surf breaks including *Jocko's*, *Hultin's*, *Laniakea's*, and *Himalaya's* (see Figure 1-2). The south end of the project site includes a bridge crossing Lauhulu Stream. The site is approximately 2.3 miles from Haleiwa.

1.3 Project Purpose and Proposed Concepts

1.3.1 *Project Purpose*

The purpose of this project is to improve safety for both pedestrians and motorists by providing safe and reliable passage and access for vehicles, bicycles and pedestrians on Kamehameha Highway along with safe access to Laniakea beach for pedestrians. While funding when the project started in 2011 was specifically intended to address shoreline erosion, the project has been redesigned to focus on pedestrian safety. With safety as the emphasis, the improvements will address the following needs:

- Safety. Improve safety for pedestrians and all modes of transportation.
- Reliability. Address or accommodate coastal erosion to improve roadway reliability.
- Congestion. Relieve congestion to reduce travel times throughout the project area.
- Pedestrian and Bicycle Facilities. Help provide safe facilities for alternative transportation.

Figure 1-1. Project location on Oahu

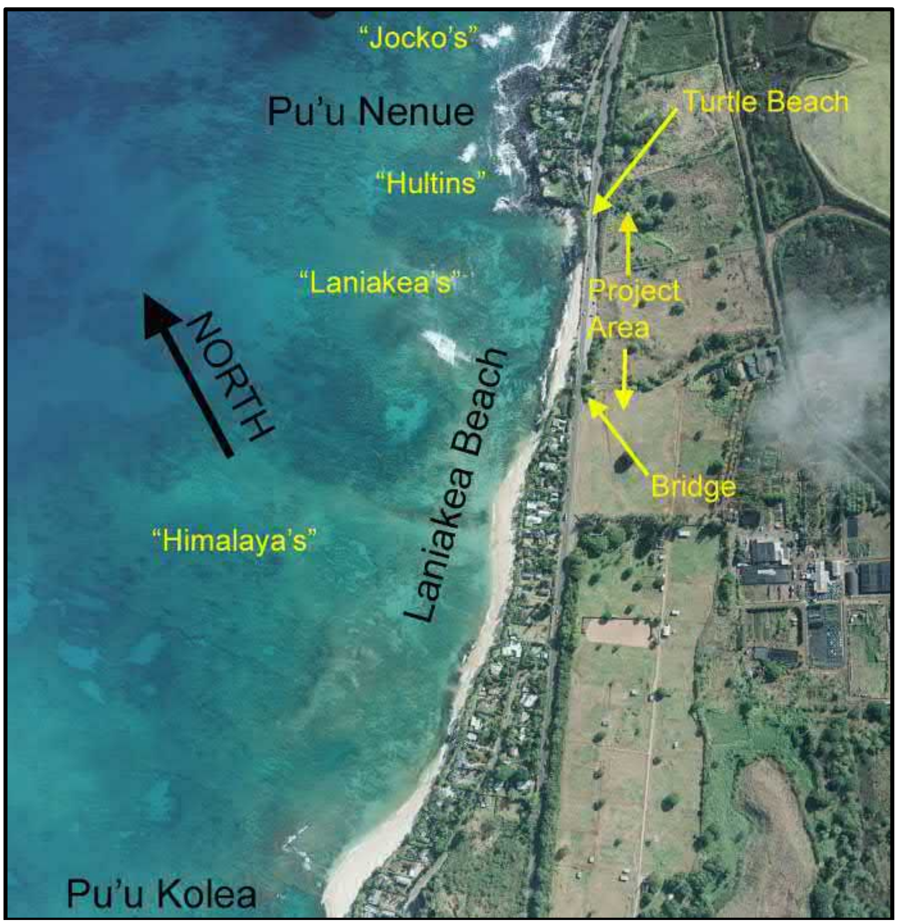


Figure 1-2. Project area at Laniakea

1.3.2 *Project Concepts*

Various project concepts have been proposed to address safety, congestion, reliability, erosion, and other issues at Laniakea Beach. A schematic section of the existing configuration is shown in Figure 1-3. This report addresses two"Build" concepts -- the "Pedestrian Shift" (Alternative 1) and the "Most" (Alternative 2) realignments. While the "Pedestrian Shift" is currently the locally preferred alternative, the "Most" Alternative has been dropped from consideration due to time and overall cost considerations. However, it is instructive to assess the "Most" Alternative as another example of realigning the highway and it has therefore been retained in this report.

In the Draft Environmental Assessment (EA) the "Pedestrian Shift" Build Alternative is evaluated along with three other concepts that assume no roadway realignment: the "No Build", the "No Build Settlement Alternative", and the "Traffic System Management" (TSM) Alternative. The "No-Build" concept would implement repairs or improvements on an as-needed basis only. The "No Build Settlement Alternative" is in response to a lawsuit filed when barriers were installed to prevent parking and would provide crosswalks from the parking area to the beach. The "TSM Alternative" would allow construction of a 1,000-foot-long guardrail on the mauka side of the highway to prevent parking.

Figure 1-5 is a plan view of the Pedestrian Shift alternative, showing the highway alignment shifted approximately 80 ft inland. The existing highway will be converted to pedestrian/bicycle access. A center utility strip will be vegetated and used for emergency vehicle access and informal parking.

The Pedestrian Shift has no open areas for parking on the mauka side of the road and also has a mauka guardrail, thereby eliminating mauka parking and pedestrian road crossing. Other features include:

- A 10-ft median refuge lane
- Vehicular guardrail to prevent parking on the mauka side of the highway
- Modification of existing cross streets and driveways to allow access to the shifted highway
- One new bridge at Lauhulu Stream
- Pedestrian and bicycle facilities consisting of a 16-ft shared use path using one lane of the existing highway

The Most alternative is a plan to move the highway as far inland as feasible, approximately 0.8 miles. A section view of the proposed alignment is shown in Figure 1-6, and a plan view is shown in Figure 1-7.

In common with the Pedestrian Shift alternative, the Most alternative keeps the pedestrian/bicycle access path and vegetated utility strip for emergency vehicle access and informal parking. Additional features of the Most alternative include:

- Vehicular guardrails will be placed on the mauka side of Kamehameha Highway during the design phase
- Two new roads will connect the new highway to the existing highway alignment
- New turn lanes where the old and new highways intersect
- Modification of existing driveways for access to the new highway
- Vehicle control gate on Pohakuloa Way

- New plantation access road
- Two new bridges at Lauhulu Stream and Kawiloa Stream
- Pedestrian/bicycle facilities on shared 16-ft path re-purposed from one lane of the old highway
- Stormwater BMP's consist of a swale on the mauka side of the highway.

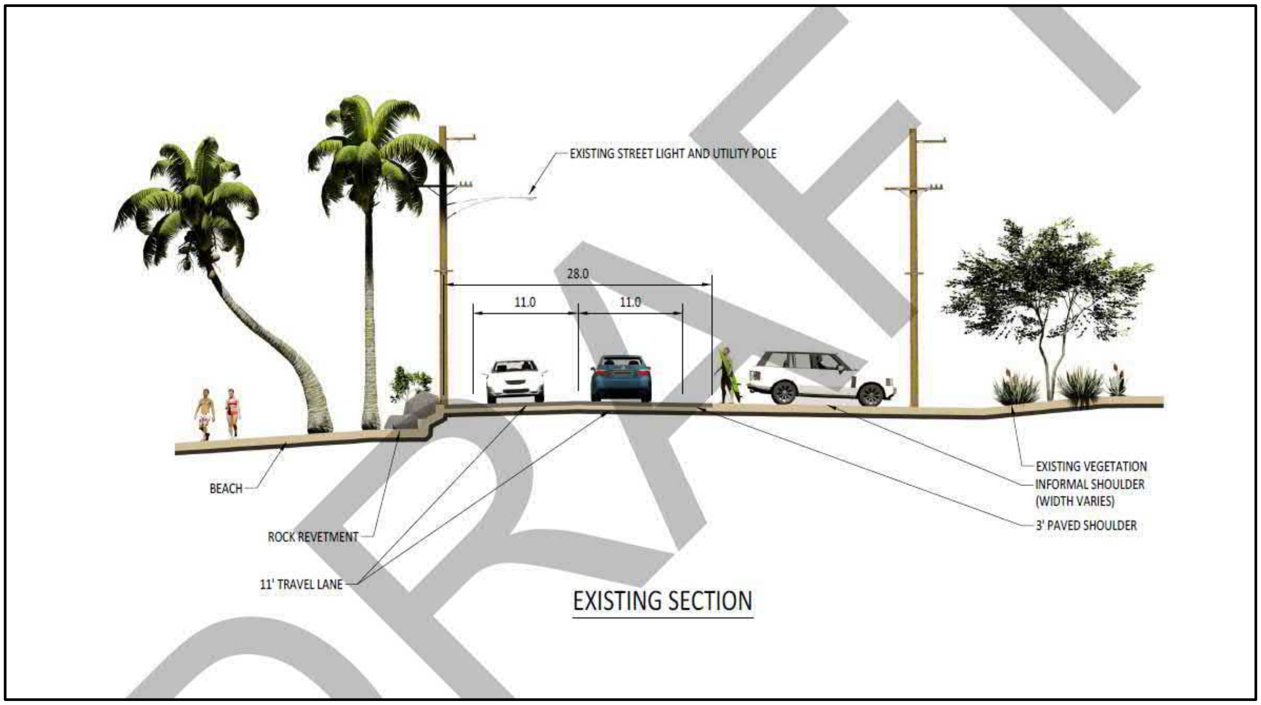


Figure 1-3. Schematic section of the exiting configuration

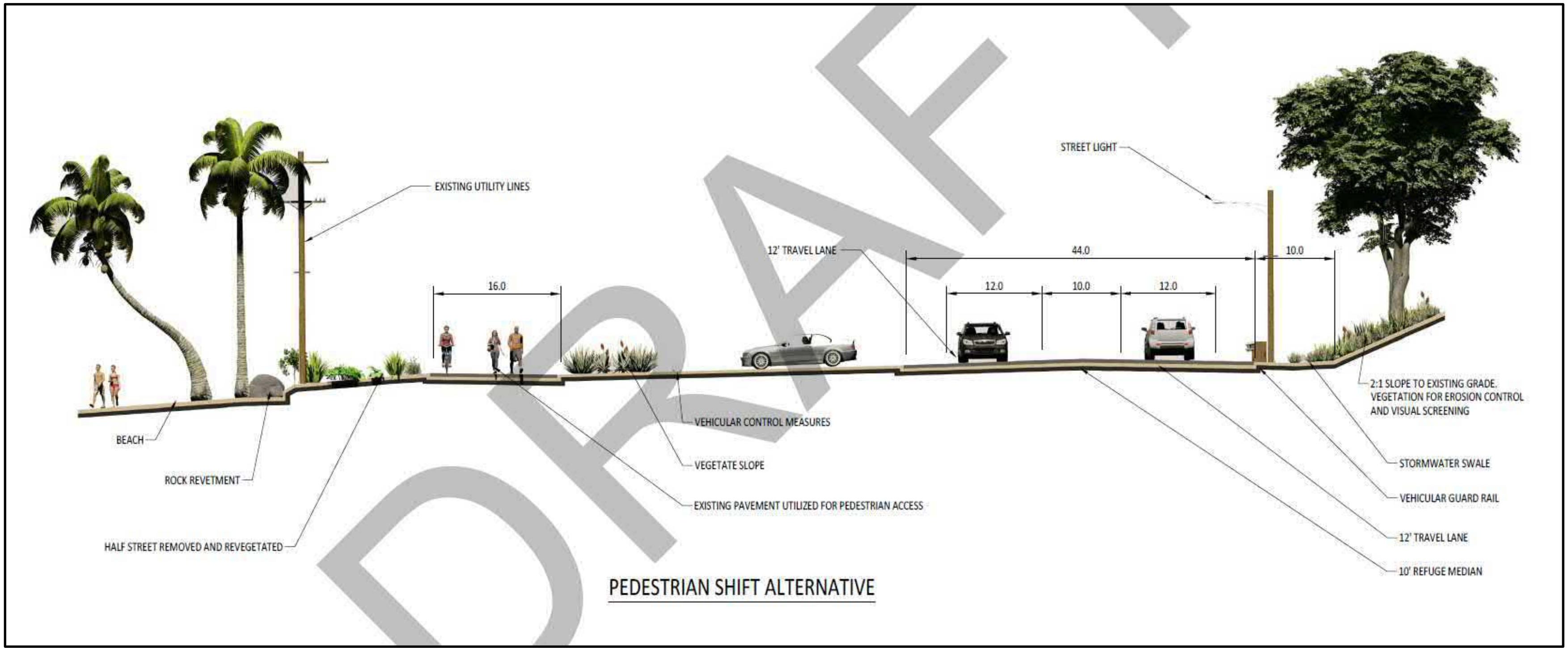


Figure 1-4. Schematic section of the Pedestrian Shift alternative (Alternative 1)

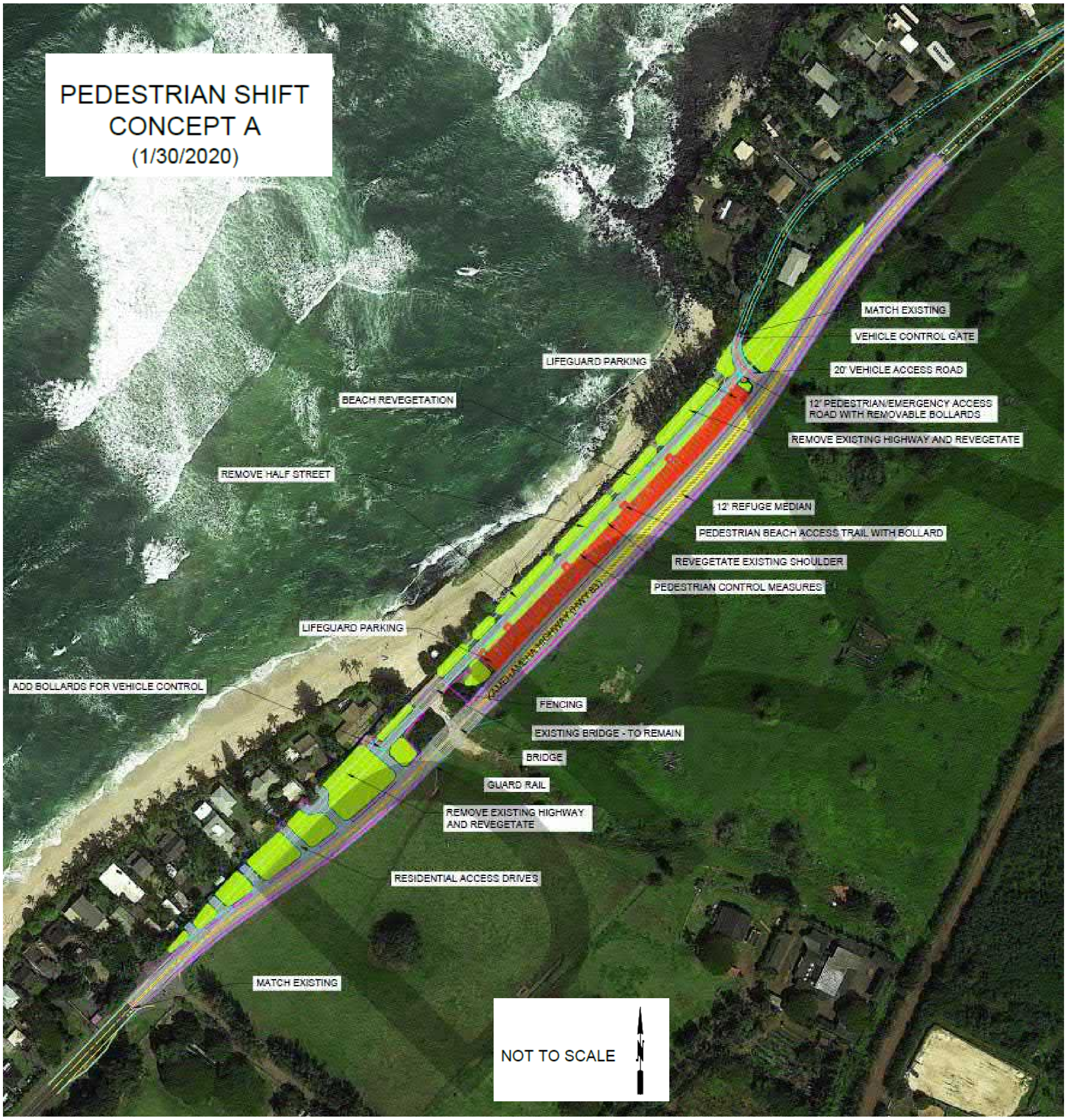


Figure 1-5. Plan view of the Pedestrian Shift alternative

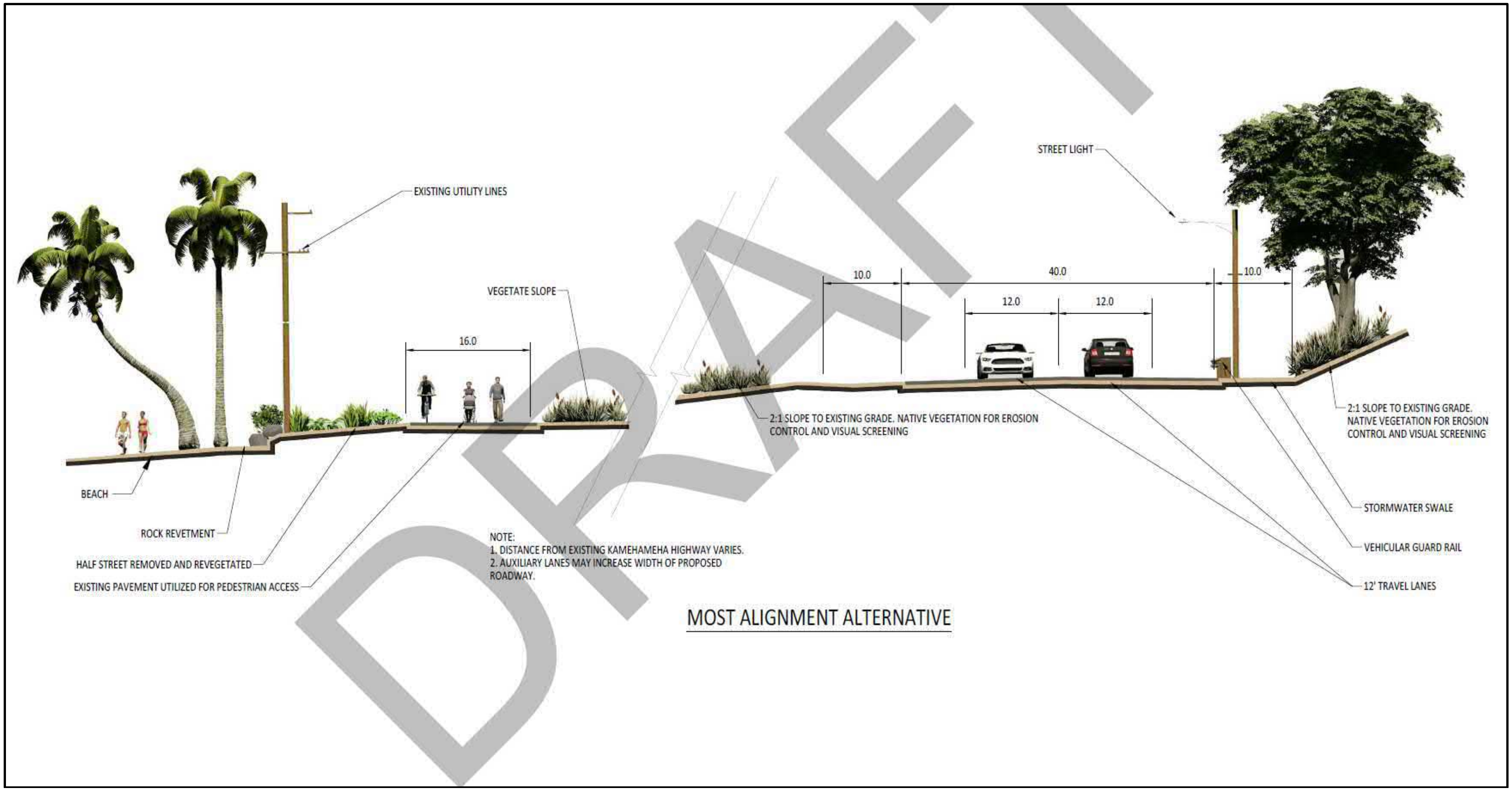


Figure 1-6. Schematic section of the Most Alignment Alternative (Alternative 2)

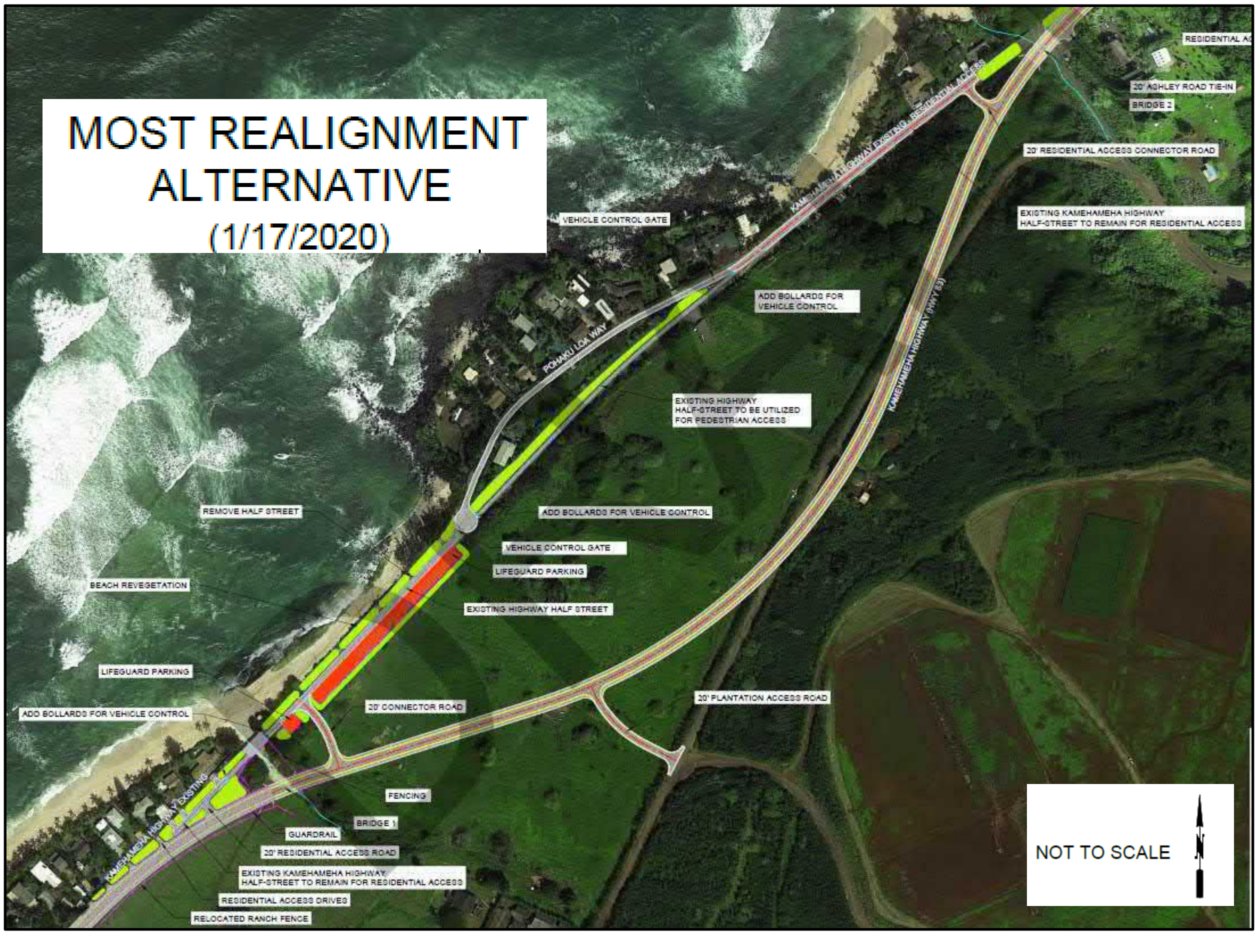


Figure 1-7. Plan view of the Most alternative (Alternative 2)

1.4 Coastal Assessment

This coastal assessment follows the State of Hawaii Office of Environmental Quality Control (OEQC) guidelines, including:

- Measurement of typical profiles across the shoreline and beach to illustrate typical conditions
- Description of the oceanographic and coastal setting, using existing available information
- Evaluation of documented and potential coastal hazards
- Description of the shoreline condition and the ongoing shoreline processes, including waves, wave run-up, and current and sediment movement
- Historical shoreline analysis of coastal erosion or accretion and shoreline changes at the project site using available aerial photographs
- Discussion of climate change and sea level rise
- Evaluation of impacts to the shoreline of proposed roadway realignments.

In addition, Section 4.4 of this report contains a summary of a companion Sea Engineering, Inc. (SEI) report to analyze tsunami runup and inundation characteristics for a 100-year tsunami event (see SEI, 2020). Section 4.7 summarizes pertinent information contained in the recent State of Hawaii Report, *Statewide Coastal Highway Program Report* (Francis et al, 2019). Section 5 contains mitigation strategies for perceived vulnerabilities and impacts.

2. PROJECT SITE DESCRIPTION

2.1 Regional Setting

The project location is on the north shore of Oahu (Figure 1-1). The region faces northwest, directly facing the most common large winter waves that the area is famous for. The winter wave climate is the dominant force that has shaped this coastline. The coastal morphology for most of the region is characterized by a high storm berm that typically varies between 15 and 25 feet in elevation depending on location and exposure. The storm berm is notably absent along much of the project area, and this allows the view from the highway to be unblocked and include the ocean.

Sand berms are common beach features that are formed by the deposition of wave-borne sand during the wave run-up process. Sand becomes suspended by the very turbulent conditions created by wave uprush, and then tends to be deposited during the more quiescent conditions at the limits of wave uprush or wave overtopping. Higher berms are created by more energetic waves. Beach berms are mostly ephemeral features that are easily erased by changing wave conditions. However, a storm berm represents the highest run-up levels achieved during extreme wave conditions and are generally fixed features. The storm berms on the north shore of Oahu are notable for their size and continuous length. While durable, certain wave conditions can cause them to erode. The sand berms are sometimes mislabeled as “dunes”, but this terminology confuses the very different morphologies of eolian (wind borne) transport processes that form dunes with the hydraulic transport processes that create the storm berms.

The north shore beaches can often be seen as a “low beach” and a “high beach”. The high beach consists of the storm berm, and is relatively permanent, while the low beach is the highly dynamic active beach profile that is continuously changing day to day (see Section 2.6.3).

The storm berms on the North Shore are very functional for protection against shoreline erosion. They are the primary defense for preventing wave inundation and damage along this coastline. Where the storm berms exist, overtopping and inland inundation is a rare occurrence even during extreme wave conditions.

While the storm berms are very stable during winter conditions when waves approach from the northwest – the prevailing winter season wave condition, they are vulnerable when waves approach at an oblique angle. Trade wind waves can wrap around the island and approach from the north, certain wave conditions allow approach from more westerly directions, and swell from the north is not infrequent during the winter (see Section 3.3.2). Oblique wave approach causes longshore sand transport and can attack the base of the storm berms, causing eventual slumping and erosion. Erosion hot spots in the storm berm system are not uncommon and can have serious consequences to ocean front homeowners, especially if the erosion persists during the high winter wave season.

The seasonal difference in wave climate (see Section 3.3) causes a general shift in beach width for many North Shore beaches. Trade wind waves occur year-round, and cause sand transport to the southwest during summer months with the absence of balancing waves from the northwest. During the summer, sand will accrete and form wide beaches against headlands such as Rocky Point and Kulalua Point (Ke Iki Beach / Log Cabin’s), and the south side of embayments such as Kawiloa Beach. The sand is pushed back to the northeast with the advent of the winter season. The persistent seasonal migration of sand is an important concept for understanding the coastal processes and erosional dynamics of the region.

In recent years (2016 through 2019) oceanographic phenomena have put erosional pressure on many Hawaiian beaches. Winter waves from a more northerly direction, persistent strong trade winds, and temporary high sea level anomalies are departures from normal conditions and have caused numerous erosional hot spots to develop on the North Shore and in many other locations across the islands. While such erosional conditions have occurred in the past, global climate change may be actively changing what has been perceived as the normal seasonal patterns.

2.2 Geology and Soils

Kawailoa Beach is on the edge of the northwest flank of the Koolau Mountains. The geology between the volcanic basalt mountains and the coast is mapped as Holocene alluvium (Figure 2-1; Sherrod et al, 2007), but as with many of the coastal plains between the mountains and the sea there are likely to be sandy beach deposits interbedded with the alluvium. Rock formations on the beach include basalt outcrops, reef rock (coralline limestone) and beach rock (cemented beach sand).

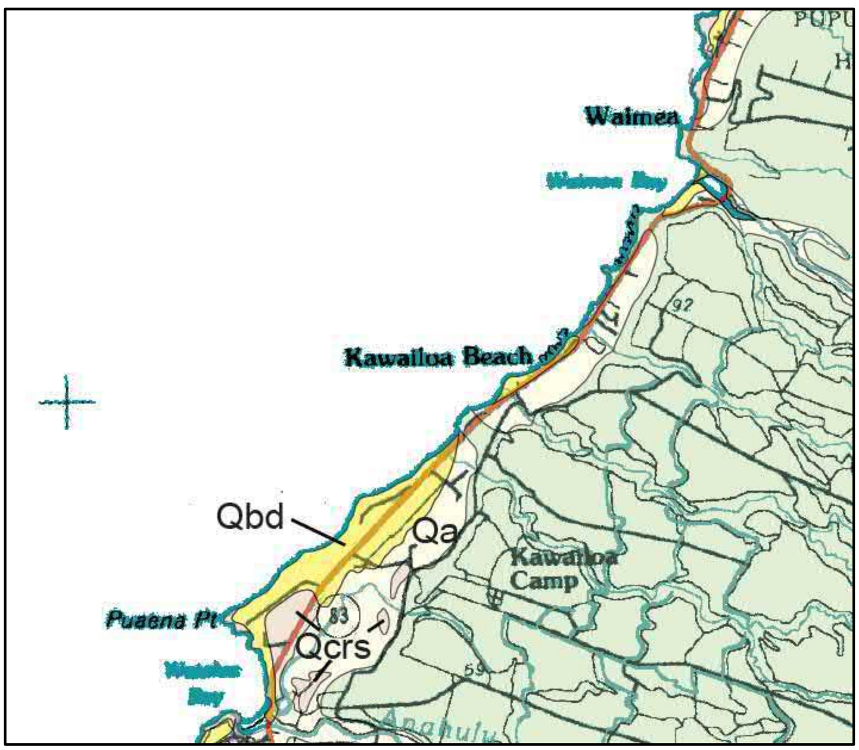


Figure 2-1. Geologic map from Sherrod et al (2007) showing Holocene alluvium (Qa) in project vicinity

The area soils analysis is contained in a comprehensive report by the United States Department of Agriculture Natural Resources Conservation Services (USDA- NRCS, 1972). The NRCS was formerly known as the Soil Conservation Service (SCS). Soil classification for agricultural purposes is different from both geological unit classifications and geotechnical soils classifications. Soil profiles are the sequences of natural layers, or horizons. A soil profile extends from the surface down to the parent material that has not been changed much by leaching or by the action of plant roots. Different soil types are named for the geographic area in which they are first identified, with sub-types being known as phases. Despite using different classification methodology, the alluvial soils catalogued for the project area are compatible with the Holocene alluvium designated on the geologic map in Figure 2-1. The soils map for the area is shown in Figure 2-2.

The soils mauka of the beach sand (BS) at Kawailoa Beach have been classified by the NRCS as *Waialua Silty Clay* (WkA), with 0 to 3 percent slopes. WkB is Waialua Silty Clay with 3 to 8 percent slopes. The Wailua Silty Clay is a phase of the Waialua Series of moderately well drained soils on alluvial fans on Oahu. The soils are derived from weathered basalt. The Wailua Silty Clay is present on smooth coastal plains. The surface layer is about 12 inches in thickness and is a dark reddish-brown silty clay. The sub-soil is about 26 inches in thickness and is also dark reddish-brown and reddish-brown in color, with a sub-angular blocky structure. Permeability of the soil is moderate. W1B is the Waialua stony silty clay, composed of Waialua Silty Clay with enough stones to hinder tillage.

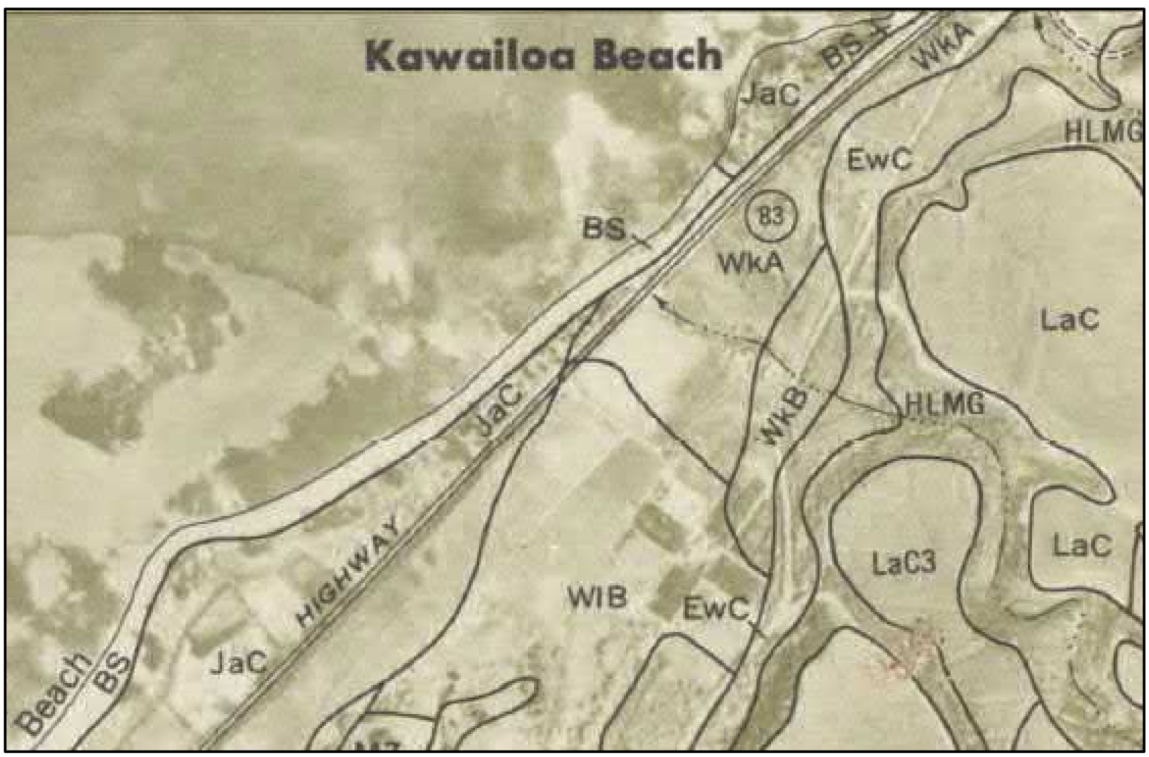


Figure 2-2. Soil types in the project area

The southern part of the reach is dominated by Jaucas Sand (JaC). It is composed of excessively drained, calcareous soils. The slope range is 0 to 15 percent and can be more than 60 inches deep. In many places the accumulation of organic matter has turned the surface layer dark brown. The soils are permeable, with low runoff.

Inland areas also contain soil types Ewa Stony Silty Clay (EwC - 6 to 12 percent slopes) and Wahiawa Silty Clay (WaB – 3 to 8 percent slopes). The Ewa Stony Silty Clay has moderate permeability, has a dark reddish-brown color and is about 42 inches in thickness. Surface stones can interfere with tillage. The substratum is coral limestone or gravelly alluvium.

Wahiawa Silty Clay is part of the Wahiawa Series of well-drained soils. They are formed from old alluvium derived from basalt. The surface layer is very dusky red and dusky red silty clay about 12 inches in thickness. The subsoil is about 48 inches in thickness with a dark reddish-brown color and subangular blocky structure. Underlying material is composed of weathered basalt.

2.3 Benthic Habitat

Geomorphology and benthic habitat offshore of the project site are shown in Figure 2-3 and Figure 2-4 from the Pacific Islands Ocean Observing System (PACIOOS) Voyager website. The data were originally collected by the National Oceanographic and Atmospheric Administration (NOAA). The images indicate that the site is primarily reef pavement and sand deposits. Biological components consist primarily of turf algae, macroalgae, and coralline algae.

Bottom conditions were also described for the site in the 1983 Oahu Coral Reef Inventory prepared by Aecos, Inc.:

> *The bottom at a depth of around 20 feet off Pu'u Nenue is mostly smooth limestone with little relief. Toward Laniakea Beach, sand channels are located offshore, breaking up the solid limestone bottom into isolated mounds of reef rock. The largest channel occurs offshore of Lauhulu Bridge. Southwest of this channel, overall relief of the limestone bottom increases. A flat bottom at -15 feet drops to depressions at -35 feet, with arches and overhangs around the margins. The depressions contain sand and rubble.*

The flora and fauna were also described in the Aecos report and are compatible with the PACIOOS data:

> *Fleshy algae dominate the bottom off Pu'u Nenue and Laniakea Beach, with 60% cover contributed by Gelidiopssi sp., Turbinaria ornata, Dictyosphaeria cavernosa, and other forms. There is little coral cover. Off Laniakea Beach, coral cover reaches 15%. Pocillopora meandrina and Montipora spp. are most abundant on the deeper, irregular bottom, while Porites lobata and M. flabellate contribute the most cover on the limestone plain at -15 feet. Large Acanthuridae are plentiful around sharp breaks in the bottom topography.*

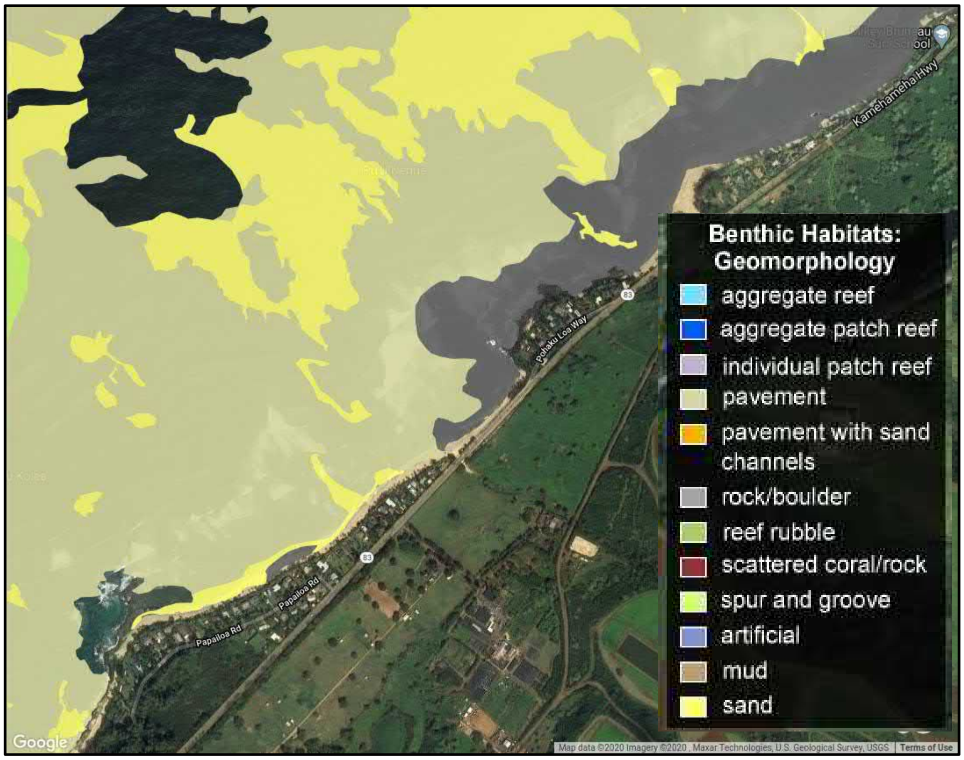


Figure 2-3. Geomorphology offshore of the project site

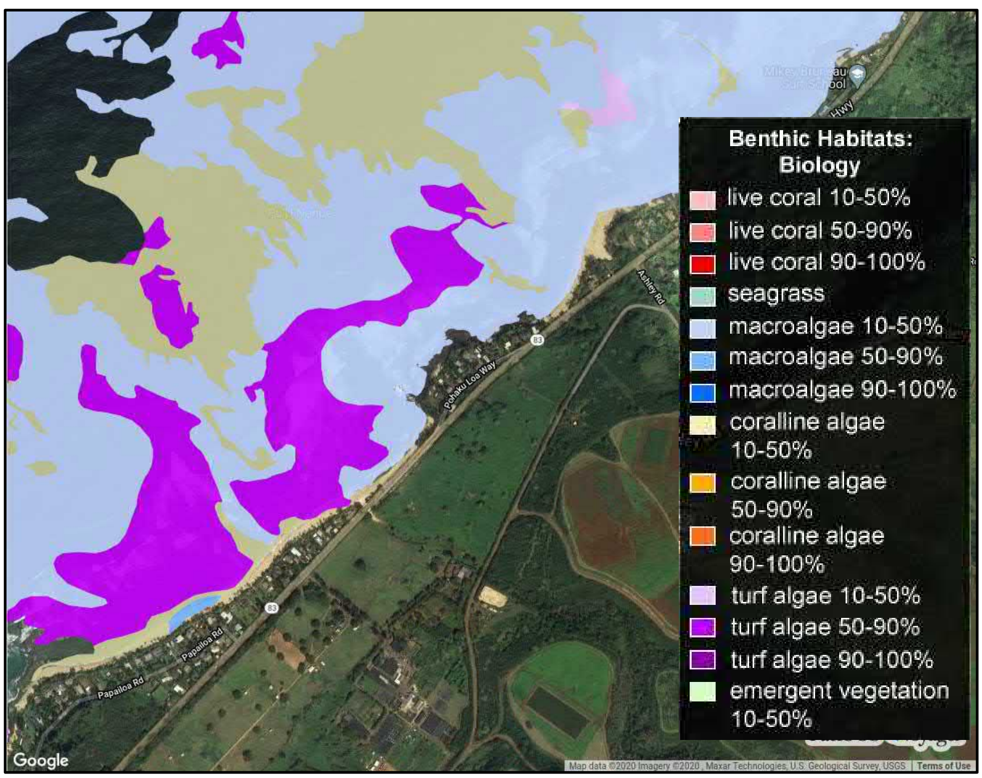


Figure 2-4. Benthic Habitat offshore of the project site

2.4 Bathymetry

Figure 2-5 is a bathymetry map of the area offshore of the project generated using LiDAR (Light Detection and Ranging) data collected by the U.S. Army Corps of Engineers in 2013. The LiDAR technique uses airborne lasers to penetrate the water and reflect off the seafloor. It is limited to relatively shallow water and calm conditions without breaking waves. The map shows the reefs associated with the four surfing breaks in the area, as well as the two relatively deeper channels on either side of the Laniakea surf site.

The offshore fringing reefs are a first defense against the large winter wave climate. Waves break and dissipate on these reefs so that they become much smaller and less energetic by the time they reach the shoreline.

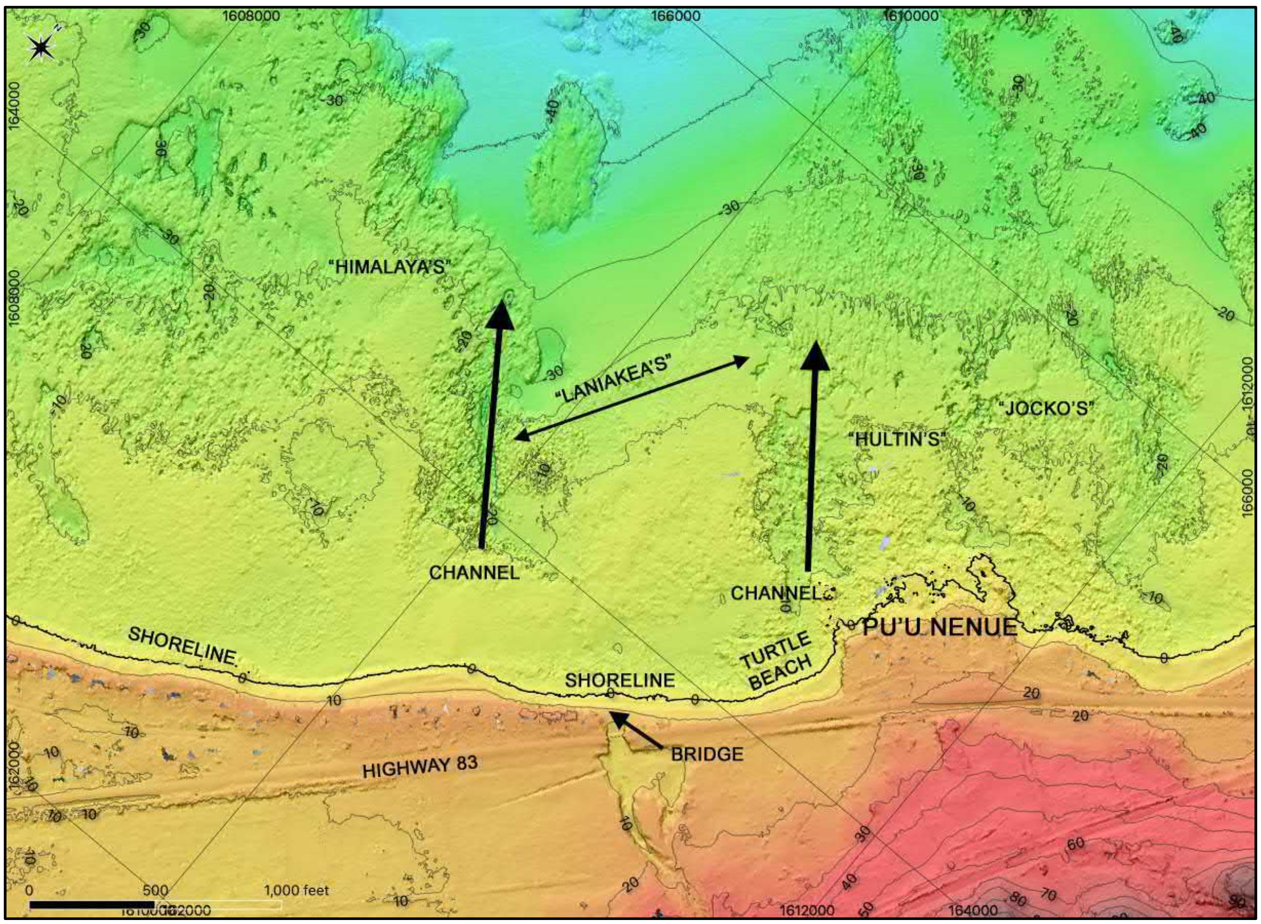


Figure 2-5. LiDAR bathymetry and topographic map of the project area

The bottom contours have a great effect on wave formation. The phenomenon of wave refraction causes waves to focus and concentrate over some of the reef promontories. The converse can be true in the channel areas, where waves may tend to radiate and spread out. Figure 2-6 shows the focusing effect of the reef off Pu'u Nenue. The figure is from one of the seminal papers on the wave refraction phenomenon by Walter Munk et al (1947). The figure also shows relatively quiet water in the channel and at Turtle Beach.

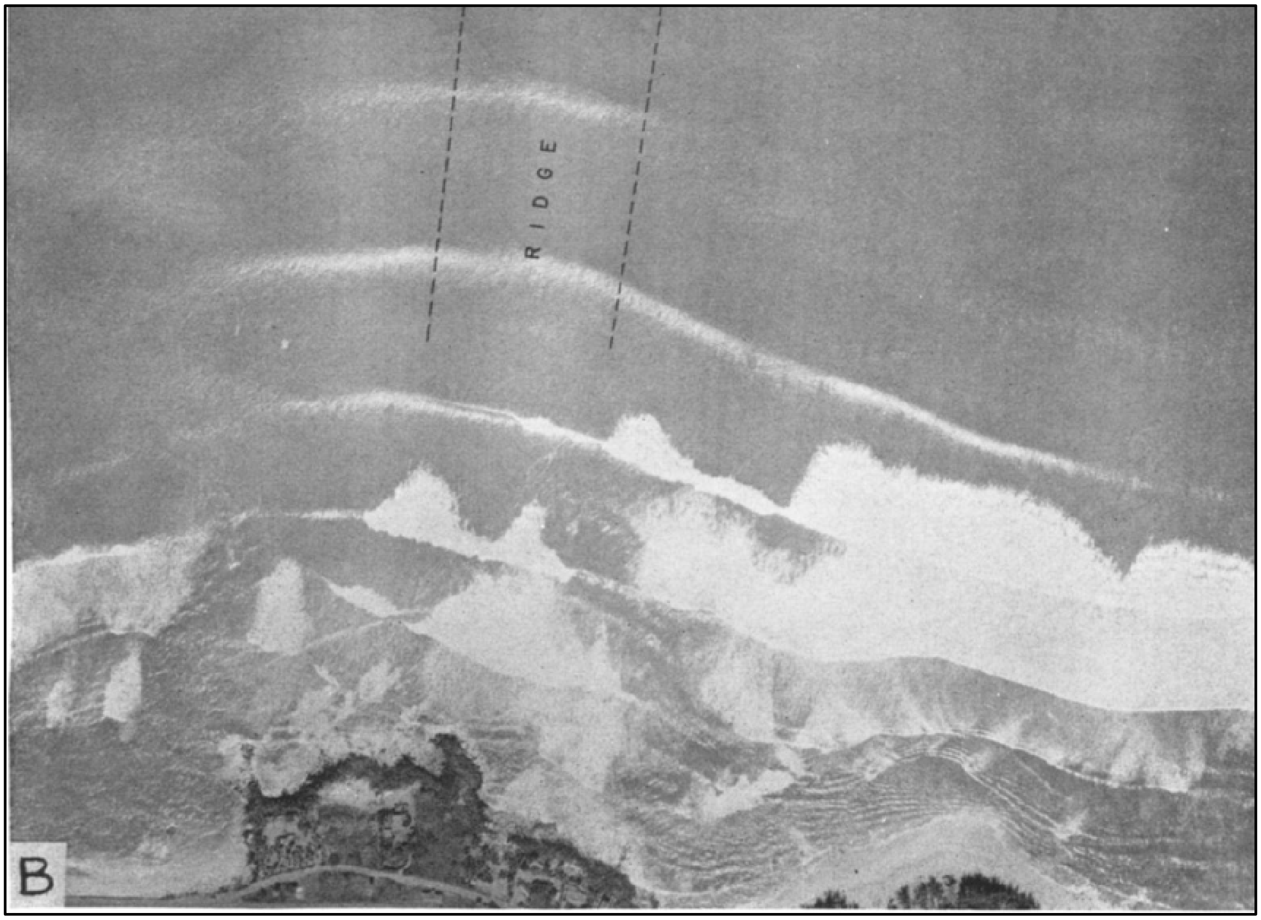


Figure 2-6. Wave concentration due to refraction at Pu'u Nenue (from Munk et al, 1947)

2.5 Shoreline History

Kawailoa Beach is dynamic, showing large variations in sand distributions, but the long-term shoreline position appears stable. The UHCGG (2010) conducted a shoreline erosion study for Oahu by analyzing the position of the beach low water mark on a series of historical aerial photographs. The Kawailoa Beach analysis used eight photographs from 1928 through 2006 as well as two "T-Sheets" from 1910 and 1924. The T-Sheets are historic coastal surveys that can be useful for showing long term changes if properly rectified to a modern coordinate system. The 1924 T-Sheet is shown in Figure 2-7. Many existing geomorphological features were mapped at that time, including the breakers at the Laniakea surfing site, Pu'u Nenue and Pu'u Kolea, the channel between Laniakea and Hultin's, a possible road near the existing highway, and the ubiquitous beach rock ledge that runs along much of the shoreline. Much of the survey appeared to be concerned with nearshore small boat navigation features such as good landings and channels through the reef.

The UHCGG historical aerial photograph analysis is shown in Figure 2-8. The analysis uses shore-perpendicular transects at 20-meter (66 ft) intervals.

The transects are weighted and smoothed to calculate the shoreline change rate. Each shoreline position is assigned a cumulative uncertainty based on a sum of potential errors in the process. Figure 2-9 is a plotted data set from a typical transect, showing the uncertainties for each point. The shoreline change rate is calculated using a weighted least squares regression (solid line). However, in this data set as well as most in this geographic vicinity, the uncertainty is greater than the change rate. The shoreline change values must therefore be used with care, with the observation that these results are indicative of a dynamic shoreline with broad migrations of sand within the littoral cell.

The UHCGG transect study shows areas of long-term beach toe recession on the order of 0.5 to 1.0 ft per year, and similar areas of accretion on the order of up to 0.5 ft per year. All of these transects are within the same littoral cell, and all accretion and erosion rates have associated high uncertainty values. The study shows the inherent difficulty of applying historical aerial photograph analysis to a highly dynamic beach. In fact, the T-sheets and photos indicate remarkably little change at this beach.

2.6 Site Description

A site visit was made by SEI on April 3, 2020 to assess the beach condition, beach morphology, and local geology. The project area comprises a distance of approximately 1,000 ft at the north end of Kawiloa Beach. There are three distinct structural morphologies from north to south along the reach: Turtle Beach, the revetment reach, and the storm berm reach (Figure 2-10).

2.6.1 *Turtle Beach*

At Turtle Beach the basalt Pu'u Nenue headland transitions to a very rough reef rock substrate. The transition area is buried by sand. Reef rock is coralline limestone formed from ancient reefs. It was likely formed during a time of higher sea level and may have been repeatedly exposed and inundated by multiple sea level changes. It is fossiliferous, rough, and weathered (Figure 2-11). At Turtle Beach the reef rock is intermittently covered with sand in low areas (Figure 2-12).

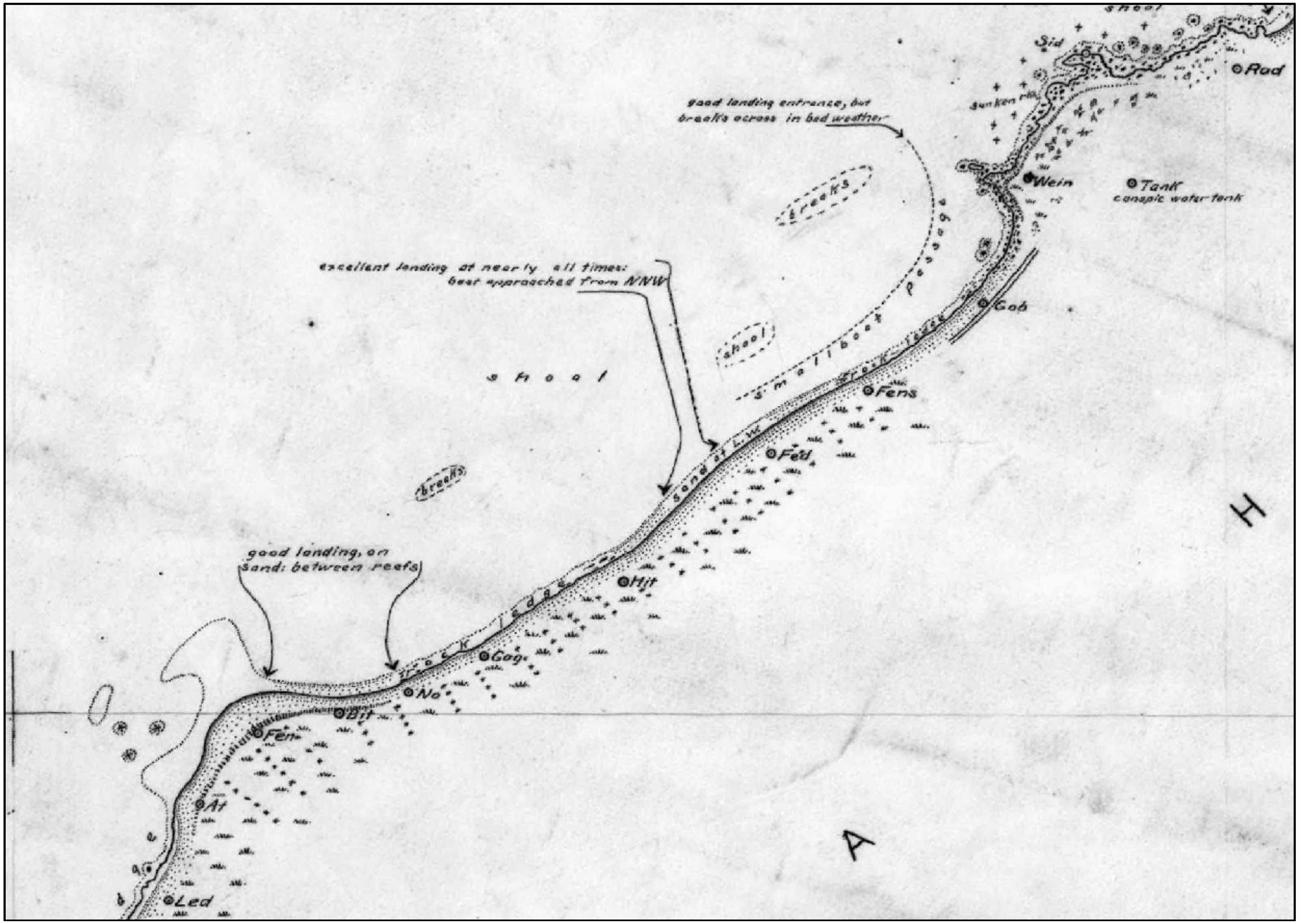


Figure 2-7. 1924 T-Sheet of Kawailoa Beach

Figure 2-8. Historical aerial photograph analysis by UHCGG

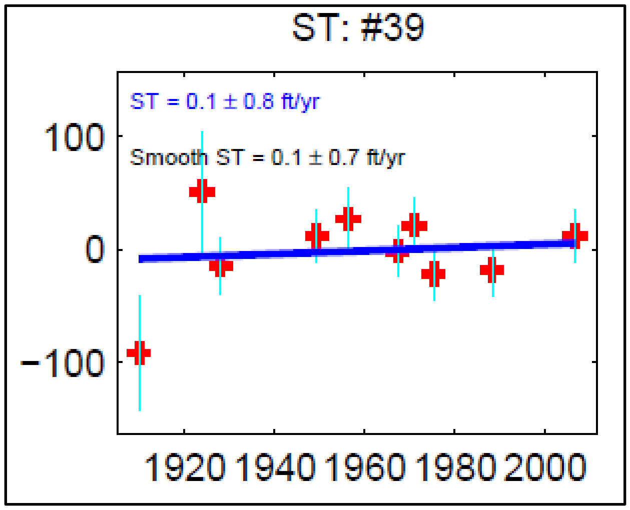


Figure 2-9. Data analysis of Transect 39 from UHCGG study

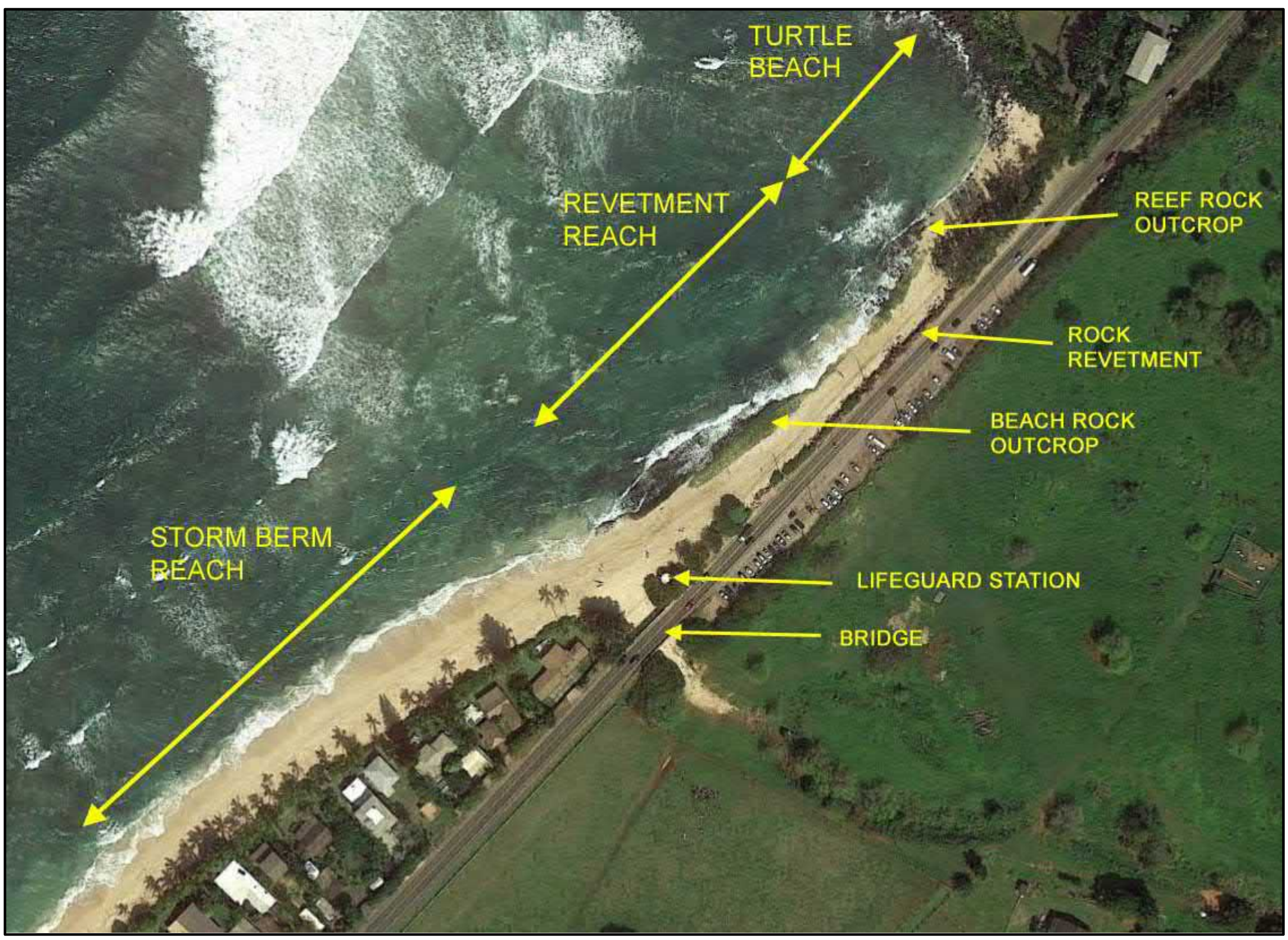


Figure 2-10. Site reaches and features

The beach is backed by a steep uncemented rock wall made from stacked basalt boulders (Figure 2-13). The back beach area, including the basalt wall is well-vegetated and does not show evidence of recent wave overtopping.

Figure 2-11. Reef rock outcrop at Turtle Beach

Figure 2-12. Turtle Beach from Pu'u Nenue

Figure 2-13. Stacked boulder wall behind Turtle Beach

2.6.2 *Revetment Reach*

The rock rubblemound revetment transitions from the stacked wall at Turtle Beach and extends approximately 450 ft to a location approximately 180 ft north of the bridge. For discussion purposes the revetment reach includes the reach beyond the end of the revetment, including the lifeguard station.

Beside the presence of a rubblemound rock revetment, the revetment reach is characterized by an abrupt transition from reef rock to shoreline outcrops of beach rock (Figure 2-14). Beach rock is a type of sandstone formed by weakly cemented beach sand and is a fundamentally different type of rock from reef rock. The beach rock outcrops underly much of the sand at Kawiloa Beach and are shown on the 1924 T-Sheet (Figure 2-7).

The rock revetment is a continuation of the stacked rock wall from the Turtle Beach reach with larger stone size and vertical height. Figure 2-15 shows a section of the wall in good condition (foreground) adjacent an area showing wall collapse. Figure 2-16 shows some of the typical revetment damage.

As designed, the wall is steep with well-interlocked stones. At damaged areas stones have been pulled away from the structure and are scattered on the beach. Some of the underlying stones are quite small and will likely be stripped away quickly during a major storm wave event. The highway embankment soils are exposed at many locations along the reach. Although still functioning as shore protection, the structure is vulnerable to extreme storm wave conditions.

Figure 2-14. Boundary between beach rock (foreground) and reef rock near Turtle Beach

Figure 2-15. Revetment reach shown original wall structure (foreground) and damaged area

Figure 2-16. Damaged revetment

The rock revetment ends abruptly with scattered stones approximately 180 feet north of the bridge abutment (Figure 2-17). The lifeguard station is on a sandy knoll next to the bridge abutment and is unprotected by rock boulders. The lifeguard station is shown in Figure 2-18, and the north bridge abutment is shown in Figure 2-19.

Figure 2-17. Scattered boulders mark the end of the rock revetment

Figure 2-18. Lifeguard Station

Figure 2-19. North bridge abutment

Revetment Armor Stone Size Analysis

The stone size of the existing revetment was analyzed in order to understand what level of protection is being provided. Ten of the larger stones were measured along three axes. The average stone dimension is 3.0 ft in diameter. Stone weight for that dimension is just over two tons (4,300 lbs.). For a revetment designed to modern standards, the stone weight correlates with a design nearshore wave height of 6.5 ft.

2.6.3 *Storm Berm Reach*

Much of Oahu's North Shore is characterized by a relatively unique storm berm morphology. Storm berms are the high sand berm found at the most landward part of the beach backshore. They are formed by wave uprush, overwash and sand deposition during infrequent large scale wave conditions. In contrast to the storm berm, the "active berm" is a transient beach feature at a lower elevation - part of the active beach profile - generated by smaller prevailing wave conditions. During extreme wave conditions, beach features that may be present during lower wave conditions may disappear, revealing the beach storm profile, including the storm berm. Figure 2-20 is a profile taken at Sunset Beach during moderate wave conditions. The storm profile, including the storm berm, is shown schematically with removal of the active profile.

Although similar in appearance to a storm berm, beach dunes are a wind-generated morphology with very different characteristics. Storm berms are often confused with dunes and, in fact, the two morphologies can be mixed at one location. Berms are limited by the wave runup elevation, while dune height is limited by sand supply, local terrain, and prevailing wind characteristics. Dune sand generally has a much finer grain size distribution than that found in the storm berm.

The Norths Shore storm berms extend with minor interruptions from Sunset Beach to Kulalua Point (Shark's Cove) and from Laniakea to Puaena Point. They are remarkable for their height and length. The berms are formed by the very large winter waves that arrive from the northwest, almost orthogonal to the shoreline. The storm berm at Sunset Beach is approximately 27 ft in elevation (Figure 2-20). Corresponding wave runup values correlate with extreme waves and return periods of 10 years and greater.

The high elevation of the storm berm morphology on the North Shore is due to the very large wave heights that prevail during the winter months (see Section 3.3.2). However, the stability of the storm berms is due to orthogonal ("straight on") approach of these waves. When waves approach at high angles of incidence, the base of the berms is eroded by longshore sand movement, leading to berm slumping and collapse. Anomalies in the wave climate, such as sustained trade wind waves, hurricane waves and other types of north swell, or anomalous west swells can destroy long reaches of the storm berm and threaten private property.

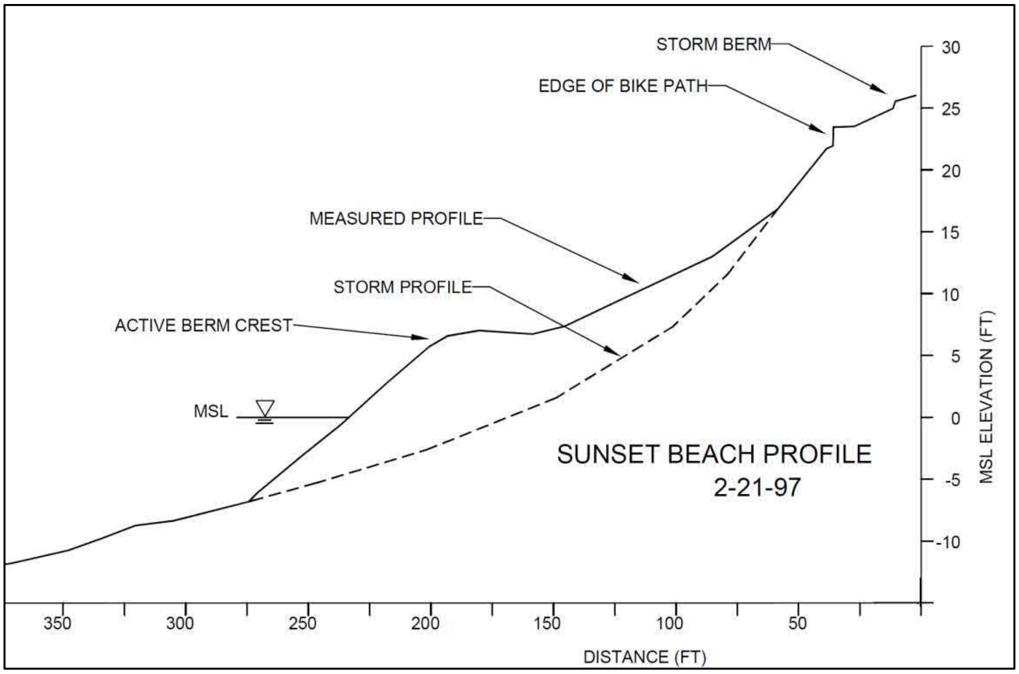


Figure 2-20. Active (measured) and storm profiles at Sunset Beach

The storm berm morphology at Kawailoa Beach begins just south of the bridge. The sand berm rises 5 to 10 ft higher than the elevation of the revetment reach. The entire reach is subdivided into lots with single family homes. Individual properties show signs of protective measures to counter erosion, primarily the deployment of geotextile drapes to protect the berm slopes (Figure 2-21 and Figure 2-22). Berm stabilization efforts using vegetation are also in evidence.

The April time frame of the site visit is part of the transitional period between the winter wave climate and the summer wave climate (see Section 3.3.2). Scarping of portions of the beach profile are indications of adjustment and sand migration (Figure 2-23). These observations were corroborated by a long-time local resident.

The storm berm reach appears to be underlain by a wide expanse of reef rock sandstone. The full extent of this formation is not known.

Figure 2-21. Geotextile drape protection for the storm berm

Figure 2-22. Geotextile drape storm berm protection

Figure 2-23. Beach scarping indicating initiation of sand migration; note broad beach rock foreshore

2.7 Beach Profiles

Topographic mapping and beach profiles of the project area were done by combining GPS-based survey with 2013 LIDAR (Light Detection And Ranging) surveys conducted by the National Ocean Survey (NOS). Figure 2-24 is a plot of the combined surveys showing the location of profile transects. The profiles are shown on Figure 2-25 and Figure 2-26.

Profiles 1 through 6 are in the Turtle Beach and revetment reaches. These profiles show good agreement between the Lidar and land surveys. Profile 7 is in the middle of the stream, where variation in sand quantities are to be expected. Profile 8, on the edge of the stream bank also shows expected variation. Profiles 9 and 10 are in the storm berm reach and show variations in beach sand quantities on the active beach profiles. The September time frame of the LIDAR survey is at the end of the summer season of trade wind transport and sand migration to the south. A depletion of sand at this north section of Kawiloa Beach is to be expected.

The storm berm profiles are also significantly higher in maximum elevation than the Turtle Beach and revetment reach, with elevations reaching over 20 ft (note: Profile 8 is likely affected by stream clearing operations). As noted in the previous section this height is likely the historical overwash elevation from infrequent extreme wave events.

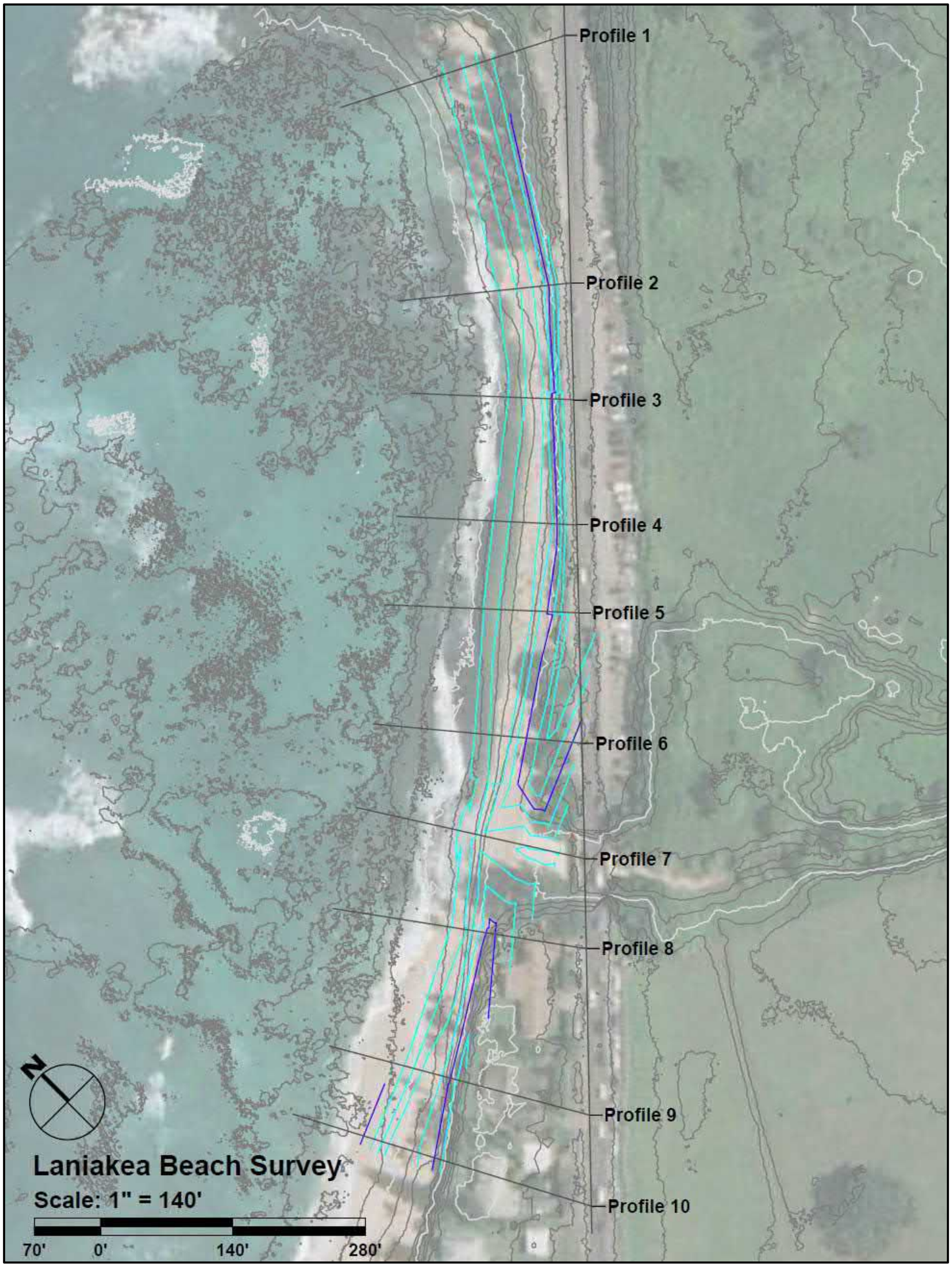


Figure 2-24. Combined LiDAR and land survey

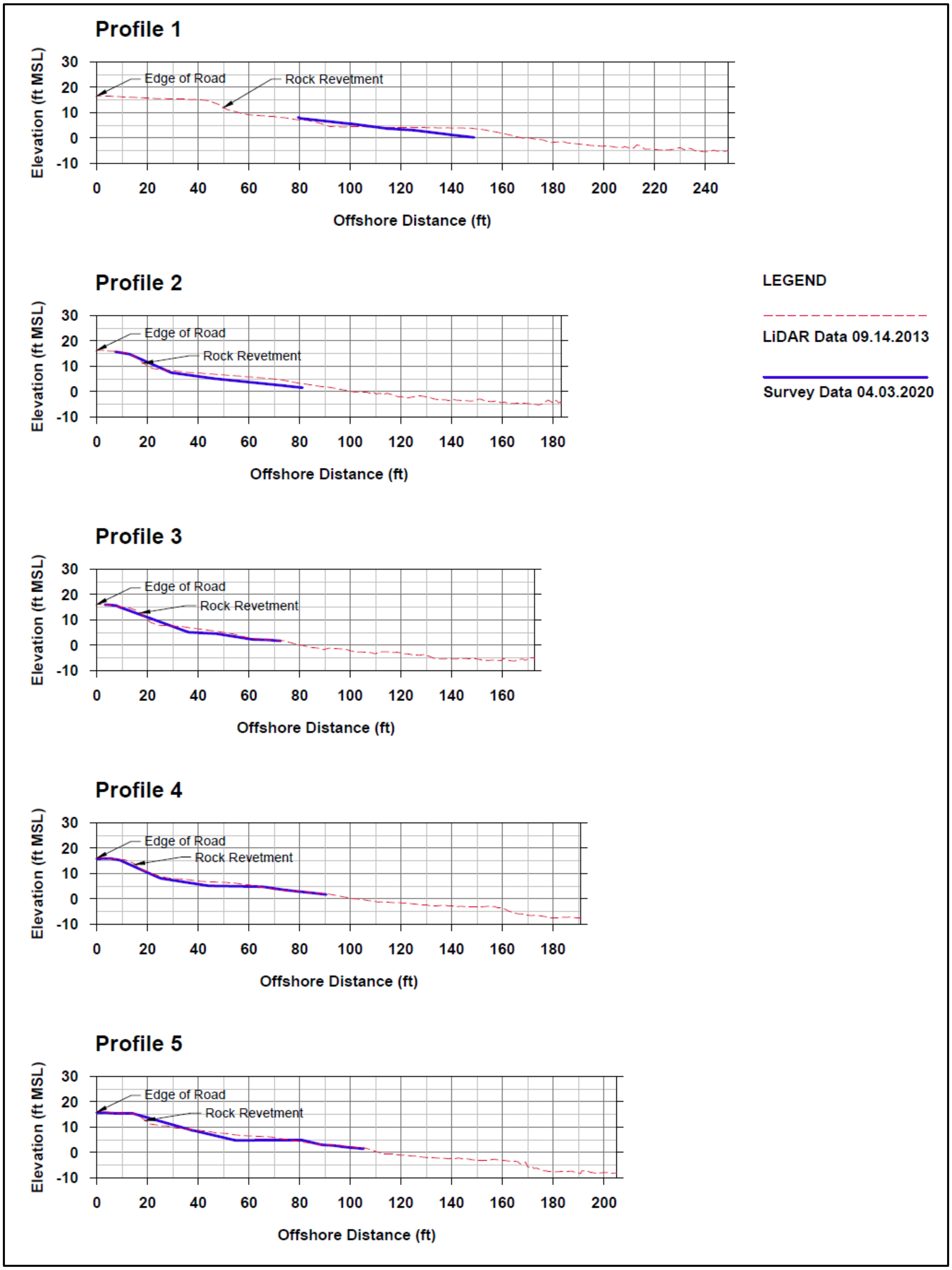


Figure 2-25. Project area profiles (1 of 2)

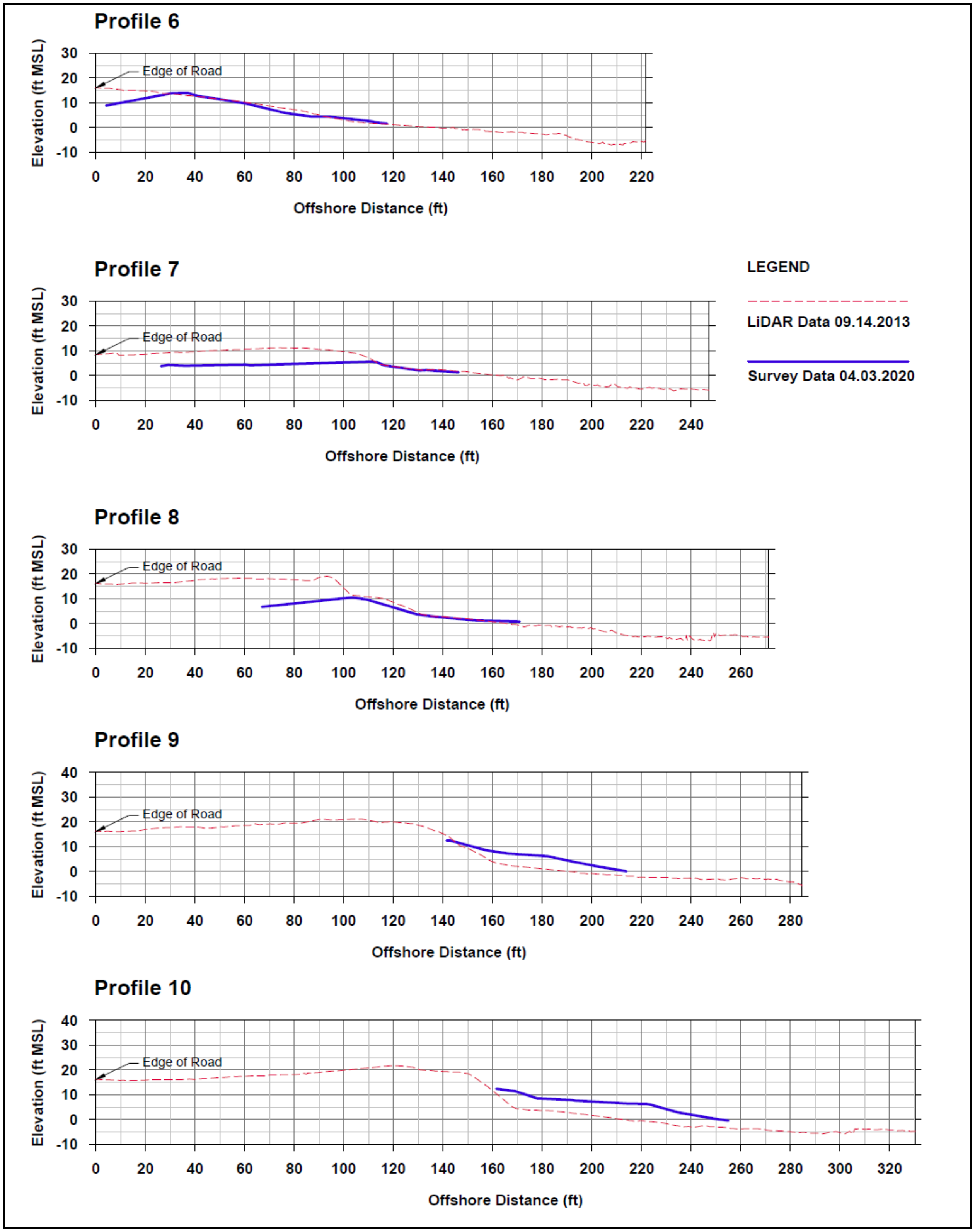


Figure 2-26. Project area profiles (2 of 2)

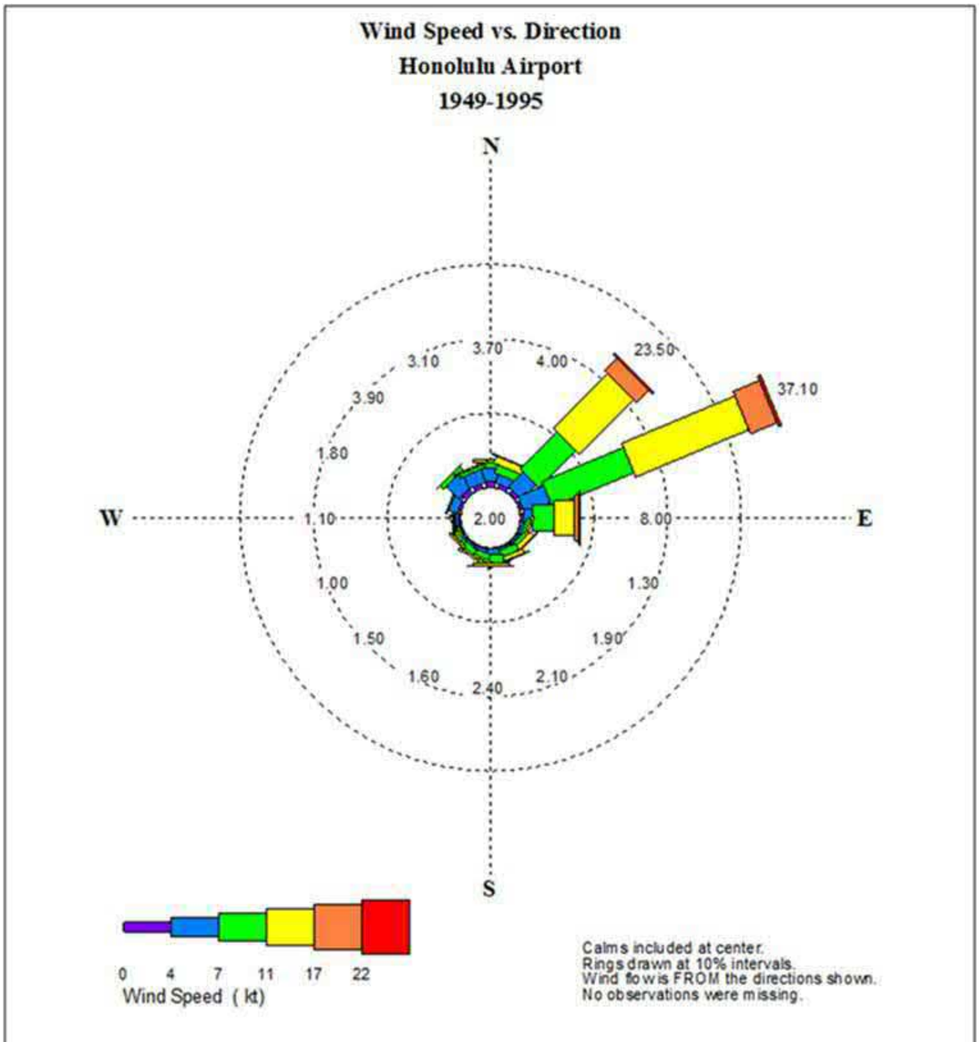
3. OCEANOGRAPHIC SETTING

3.1 Winds

The prevailing winds throughout the year in Hawaii are the northeasterly trade winds. Trade wind frequency varies from more than 90% during the summer season to only 50% in January, with an overall annual frequency of 70%. Westerly, or Kona, winds occur primarily during the winter months, generated by low pressure systems near the islands. Figure 3-1shows a wind rose diagram applicable to the project site based on wind data recorded at Daniel K. Inouye International Airport between 1949 and 1995.

Trade winds are produced by the outflow of air from the Pacific Anticyclone high pressure system, also known as the Pacific High. The center of this system is located well north and east of the Hawaiian chain and moves to the north and south seasonally. In the summer months, the center moves to the north, causing the trade winds to be at their strongest from May through September. In the winter, the center moves to the south, resulting in decreasing trade wind frequency from October through April. During these months, the average monthly trade wind frequency of occurrence decreases to about 50%.

Wind patterns of a more transient nature increase during the winter months. Winds from extra-tropical storms can be very strong from almost any direction, depending on the strength and position of the storm. The low-pressure systems associated with these storms typically track west to east across the North Pacific, north of the Hawaiian Islands. At Daniel K. Inouye International Airport, gusts resulting from these storms have on several occasions exceeded 60 mph. Kona winds are generally from a southerly to southwesterly direction and are sometimes associated with slow moving low pressure systems known as Kona lows situated to the west of the island chain. These storms are often accompanied by heavy rains.



PERCENT OCCURRENCE: Wind Speed (kt)
LOWER BOUND OF CATEGORY

DIR	0	4	7	11	17	22
N	0.80	1.70	0.90	0.30	0.00	0.00
NNE	0.50	1.20	1.20	1.00	0.10	0.00
NE	0.60	2.80	7.10	10.30	2.40	0.30
ENE	0.40	3.80	12.00	16.60	3.90	0.40
E	0.30	1.30	2.90	2.80	0.60	0.10
ESE	0.10	0.40	0.50	0.30	0.00	0.00
SE	0.10	0.30	0.70	0.70	0.10	0.00
SSE	0.10	0.30	1.00	0.60	0.10	0.00

TOTAL OBS = 134736 MISSING OBS = 0

PERCENT OCCURRENCE: Wind Speed (kt)
LOWER BOUND OF CATEGORY

DIR	0	4	7	11	17	22
S	0.10	0.60	1.20	0.40	0.10	0.00
SSW	0.10	0.40	0.80	0.30	0.00	0.00
SW	0.10	0.30	0.80	0.30	0.00	0.00
WSW	0.10	0.20	0.40	0.30	0.00	0.00
W	0.20	0.50	0.20	0.20	0.00	0.00
WNW	0.40	1.20	0.20	0.00	0.00	0.00
NW	0.80	2.40	0.60	0.10	0.00	0.00
NNW	0.60	1.80	0.50	0.20	0.00	0.00

CALM OBS = 2695 PERCENT CALM = 2.00

Figure 3-1. Frequency of occurrence of wind speed and direction, Daniel K. Inouye International Airport

3.1.1 *Extreme Winds*

The annual maximum 2-minute averaged wind speeds are available for the NOAA weather station at Honolulu International Airport for the 44-year period from 1969 to 2012. Results are presented in Table 3-1, ordered by wind speed. Some of the annual maxima shown are associated with specific storm events, most notably, the highest value of 46 miles per hour in November of 1982 which was the result of the passage of Hurricane Iwa. Other events include Hurricane Iniki in

1992 at 38 miles per hour, and several severe Kona storms with wind speeds up to 40 miles per hour.

Table 3-1. Annual Maximum 2-minute Wind Speeds at Daniel K. Inouye International Airport

Year	Wind Speed (MPH)	Year	Wind Speed (MPH)
1982	46	1972	33
1969	40	1973	33
1970	40	1993	33
2004	40	1999	33
2007	39	2010	33
2011	39	1997	32
1976	38	2003	32
1992	38	2005	32
1977	37	1994	31
2008	37	2006	31
1975	36	1981	30
2002	36	1985	30
1980	35	1986	30
1990	35	1989	30
2000	35	2012	30
2001	35	1987	29
2009	35	1988	29
1971	34	1984	28
1974	34	1991	28
1978	34	1995	28
1979	34	1996	28
1998	34	1983	23

An extreme value distribution was applied to the 44-annual maximum 2-minute averaged wind speed records to develop expected extreme wind speeds for various return periods ranging from 1 to 100 years. The extreme value wind speeds are presented in Table 3-2.

The report Hurricanes in Hawaii (Haraguchi, 1984), prepared for the U. S. Army Corps of Engineers, Honolulu Engineer District, presents a hypothetical hurricane model and a series of worst-case scenarios for the Hawaiian Islands. The model hurricane is defined as the probable hurricane that will strike Hawaii in the future, based on the characteristics of storms that have previously approached or struck the islands. The worst-case hurricane characteristics are derived from a subjective analysis of the data from 20 significant hurricanes in the Central Pacific and an understanding of the basic atmospheric and oceanic conditions surrounding the Hawaiian Islands.

Haraguchi estimated the model hurricane wind speed in the vicinity of the Hawaiian Islands to be 75 miles per hour. This value falls beyond the 100-year return period wind predicted by the extreme value distribution for Honolulu, shown in Table 3-2 By comparison, the maximum 2-

minute averaged wind recorded at Daniel K. Inouye International Airport in the last 44 years (1969 to 2012) was 46 miles per hour, which is equivalent to the 50-year wind speed from Table 3-2.

Table 3-2. Extreme Value Distribution Return Periods for 2-Minute Averaged Wind Speeds at Daniel K. Inouye International Airport (1969 to 2012)

Return Period (years)	Wind Speed (MPH)
1	33.3
2	35.6
5	38.7
7	39.8
10	41.0
15	42.3
20	43.3
25	44.0
30	44.6
40	45.6
50	46.3
75	47.7
100	48.6

3.2 Water Levels

3.2.1 *Tides*

Hawaii tides are semi-diurnal with pronounced diurnal inequalities (i.e. two high and two low tides each 24-hour period with different elevations). Variation of the tidal range results from the relative position of the moon and the sun. During full moon and new moon phases, the moon and sun are in line and act together to produce larger "spring" tides, where the difference between high and low tide is the greatest. When the moon is in its first or last quarter, smaller "neap" tides occur, where the difference between high and low tide is the least. The cycle of spring to neap tides and back is half the 27-day period of the moon's revolution around the Earth and is known as the “fortnightly cycle”. The combination of diurnal, semi-diurnal and fortnightly cycles dominates variations in sea level throughout the Hawaiian Islands.

King Tides is a colloquial term that has become popular in recent years to describe coastal flooding. The term has been used as a label for abnormally high tides that are the result of a combination of water level phenomena. *Perigean spring tides* are the highest tide levels of the year and are caused by the combined alignments of the earth, sun, and moon during the winter and summer months when the moon is closest to the earth (*perigee*). Perigean spring tides are strictly an astronomical phenomenon. Other water level phenomena include localized ocean gyres, or *mesoscale eddies*, that raise local sea level by up to 0.5 ft, and larger scale ocean basin phenomena related to El Nino that can also raise sea level by up to 0.5 ft. The combination of these phenomena became highly noticeable during the summer of 2017 when the King Tide label became widespread.

Tidal predictions and historical extreme water levels are provided by the National Ocean and Atmospheric Administration (NOAA) NOS (National Ocean Service) Center for Operational

Oceanographic Products and Services (CO-OPS). The nearest NOAA tide station is located at Honolulu Harbor (Station ID: 1612340). Water level data from Station 1612340, based on the 1983 to 2001 tidal epoch, is shown in Table 3-3.

Table 3-3. Water Level Data for Honolulu Harbor, Station 1612340 (NOAA)

Datum	Elevation (feet, MLLW)	Elevation (feet, MSL)
Mean Higher High Water (MHHW)	+1.90	+1.08
Mean High Water (MHW)	+1.44	+0.62
Mean Sea Level (MSL)	+0.82	0.0
Mean Low Water (MLW)	+0.16	-0.66
Mean Lower Low Water (MLLW)	0.00	-0.82

3.2.2 *Still Water Level Rise*

Storms and large waves can produce elevated water levels at the shoreline. During annual large wave or heavy storm conditions this water level rise can be on the order of a foot above the tide level. However, during extreme events, the still water level rise can be significantly greater.

During high wave events, the nearshore water level may be elevated above the tide level by the action of breaking waves offshore. This water level rise, termed *wave setup*, may be as much as 10 to 12% of the breaker height. Thus, the water level could be elevated an estimated 1 to 2 feet during severe storm wave conditions.

During strong storm or hurricane conditions, with high winds and very low pressures, an additional water level rise due to wind stress and reduced atmospheric pressure can occur. The combined effect is known as *storm surge*, and this rise can potentially add another 1 to 2 feet to the stillwater level. For example, during the 1992 passage of Hurricane Iniki over Port Allen Harbor on the island of Kauai, a National Weather Service tide gauge recorded a water level rise of 4.9 feet above the predicted tide elevation.

The potential stillwater level rise at the shoreline is an important design parameter because nearshore wave heights are limited by the water depth. Water level rise due to wave setup or storm surge, added to high tide levels, will therefore increase the size of nearshore waves.

The total stillwater level rise is a linear combination of:

1) Astronomical tide (Sa),
2) Sea level rise due to atmospheric pressure reduction (Sp),
3) Wind tide caused by wind stress component perpendicular to the coast line (Sx),
4) Wind tide caused by wind stress component parallel to the coast line (Sy), and
5) Wave set-up on the beach due to breaking waves (Sw).

or,

$$S = Sa + Sp + Sx + Sy + Sw$$

The combination of Sp, Sx and Sy is defined as storm surge. Outside of the breaking surf zone, the stillwater level is composed of storm surge added to the tide level.

3.2.3 *Sea Level Anomalies*

The ocean surface has a variable elevation. Sea level anomalies are the difference between the measured and predicted tides apart from the relatively short term storm and wave event related phenomena. The anomalies may be caused by climatic and oceanographic processes, both regional and widespread.

Large oceanic eddies have recently been recognized that propagate through the islands. These eddies, termed *mesoscale eddies* (Merrifield, 2004) produce tide levels that can be on the order of 0.5 ft higher (and sometimes lower) than normal for periods up to several weeks. An additional temporary but long-lived sea level rise on the order of 0.5 feet has also been associated with phenomena related to the El Niño / Southern Oscillation (ENSO). The combined effect can produce sea level anomalies up to one foot above the predicted tides.

In 2017, Hawaii experienced anomalous sea levels which caused significant inundation of low-lying urban areas in Waikiki and Honolulu. The daily maximum recorded tide at Honolulu Harbor from February through October 2017 is shown in Figure 3-2. The plot also shows the corresponding predicted tide and the resulting anomaly. Sea level anomalies during the high-water events ranged from approximately 0.5 ft to 1 ft above the astronomical tide. The anomalies were particularly noticeable during perigean tides, and the highest events became popularly known in media as King Tide events.

The end of 2019 also marked an extended period of large sea level anomalies. Figure 3-3 is a plot of the tides from December 24 to 27, 2019. During this period, sea level anomalies of +0.6 to +1.1 ft added to the winter perigean tides, resulting in the highest recorded water level at Honolulu Harbor of +3.4 ft MLLW.

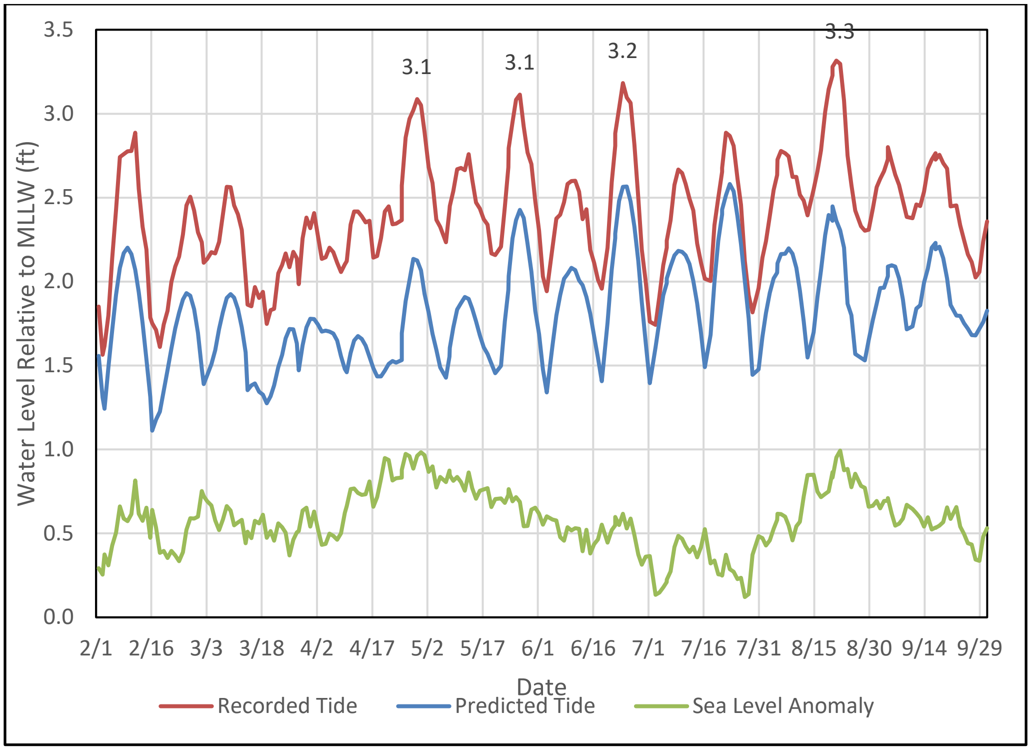


Figure 3-2. Daily maximum measured tides at Honolulu Harbor and corresponding predicted tides and sea level anomaly (February 1-October 1, 2017)

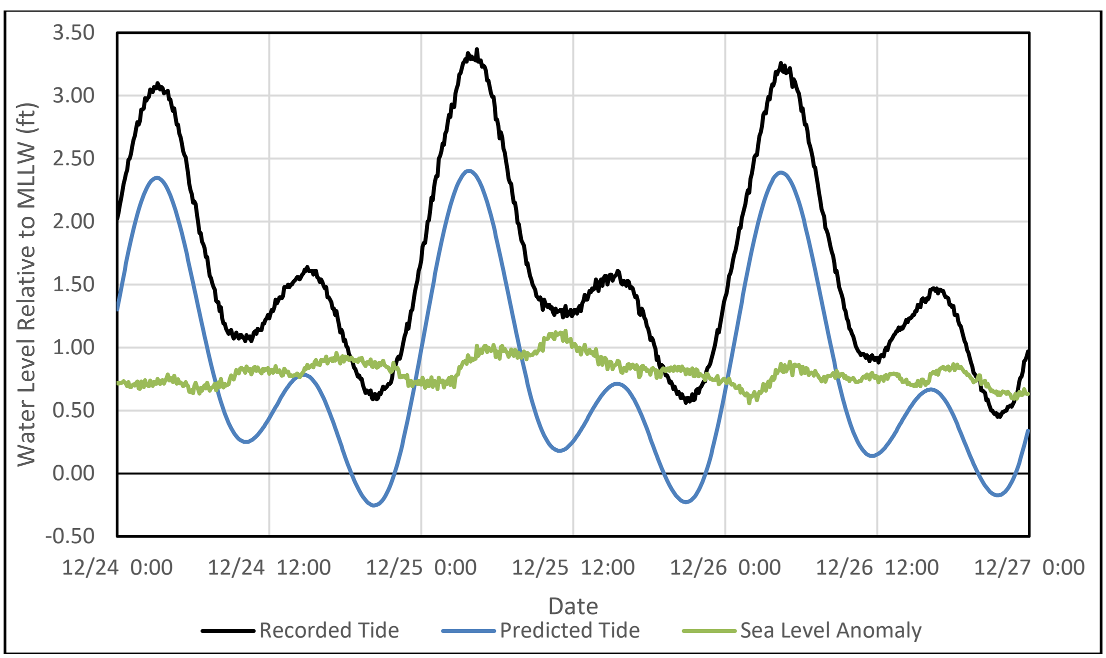


Figure 3-3. Predicted and measured tides at Honolulu Harbor (December 24-26, 2019)

3.3 Waves

3.3.1 *General Wave Climate*

The wave climate in Hawaii is typically characterized by four general wave types. These include northeast trade wind waves, southern swell, North Pacific swell, and Kona wind waves (Figure 3-4). Tropical storms and hurricanes also generate waves that can approach the islands from virtually any direction. Unlike winds, any of these wave conditions may occur at the same time.

Trade wind waves occur throughout the year and are the most persistent in April through September when they usually dominate the local wave climate. They result from the strong and steady trade winds blowing from the northeast quadrant over long fetches of open ocean. Trade wind deep water waves are typically between 3 to 8 feet high with periods of 5 to 10 seconds, depending upon the strength of the trade winds and how far the fetch extends east of the Hawaiian Islands. The direction of approach, like the trade winds themselves, varies between north-northeast and east-southeast and is centered on the east-northeast direction. Although the North Shore is sheltered from the direct approach of trade wind waves by island shadowing, a significant portion of the trade wind wave energy reaches the area by diffracting around the northeast end of the island, and contributes to generally rough offshore sea conditions during trade wind conditions.

Southern swell is generated by storms in the southern hemisphere and is most prevalent during the summer months of April through September. Traveling distances of up to 5,000 miles, these waves arrive with relatively low deep water wave heights of 1 to 4 feet and periods of 14 to 20 seconds. Depending on the positions and tracks of the southern hemisphere storms, southern swells approach between the southeasterly and southwesterly directions. Southern swell is blocked by island shadowing and does not affect the North Shore.

During the winter months in the northern hemisphere, strong storms are frequent in the North Pacific in the mid latitudes and near the Aleutian Islands. These storms generate large North Pacific swells that range in direction from west-northwest to northeast and arrive at the northern Hawaiian shores with little attenuation of wave energy. Deepwater wave heights often reach 15 feet and in extreme cases can reach 30 feet. Periods vary between 12 and 20 seconds, depending on the location of the storm. The North Shore is directly exposed to these waves.

Kona storm waves are infrequent, occurring only about 10 percent of the time during a typical year. Kona waves typically range in period from 6 to 10 seconds with heights of 5 to 10 feet, and approach from the southwest through west. Only the more westerly Kona storm waved reach the North Shore, with other directions blocked by island shadowing. Deepwater wave heights during the severe Kona storm of January 1980 were about 17 feet. The waves during this event had a significant impact on the south and west shores of the islands.

As noted by the historical significance of Hurricanes Iwa (1982) and Iniki (1992), severe tropical storms and hurricanes have the potential to generate extremely large waves that can affect the all shorelines of Oahu.

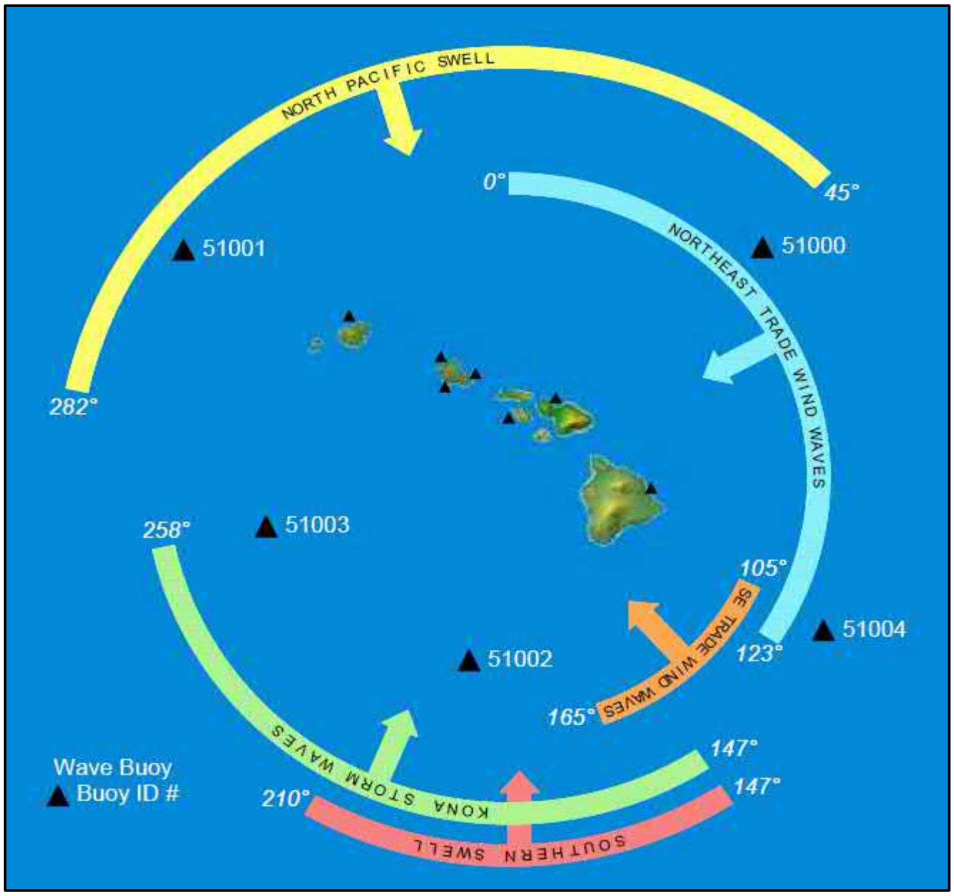


Figure 3-4. Common wave types and approach directions in Hawaii

3.3.2 *North Shore Wave Climate*

There are two basic wave data analysis presentations. As noted in Section 3.3.1, multiple wave types can be present at any one place and time. *Parametric* data analysis reports only the most energetic or largest existing wave type. *Spectral* data analysis separates wave information into multiple components and then assemble the statistics for each individual wave type. It is a method to show more subtle, smaller waves that might not be apparent in the parametric process. Physical wave measurement can be difficult, and wave buoy data are usually presented as parametric results. In recent years, computer simulations of wave generation and propagation has become a powerful method for wave forecasting and hindcasting. In particular, the WaveWatch III program has become a powerful tool for wave analysis. Global wind data from models and measurements can be used predict complex wave fields anywhere in the world. *Virtual buoys* are convenient locations where the model outputs can be sampled. Spectral data analysis is used at these locations because the wave fields are calculated with the models, and do not have to be measured with a physical device.

CDIP 106 is a wave measurement buoy operated by the National Oceanographic and Atmospheric Administration (NOAA) Coastal Data Information Program (CDIP). The buoy is located approximately four miles offshore of Waimea Bay and has been providing wave data since 2001.

HNL 10 is a virtual buoy located approximately 25 miles NNE of Kahuku Point. Buoy locations are shown in Figure 3-5. Both buoys are sheltered from waves arriving from the south, and CDIP 106 is partially sheltered from trade wind waves from the northeast and east.

Figure 3-5. Wave buoy locations

Figure 3-6 is a wave rose diagram for parametric wave height data for CDIP 106 over an eighteen-year period. The direction of arrival is divided into a 16-point compass rose, with size of the sector governed by frequency of occurrence, and significant wave height (Hs) denoted by color. Figure 3-7 shows the wave period rose diagram for the same set of data. The wave period is the interval of time between successive wave crests.

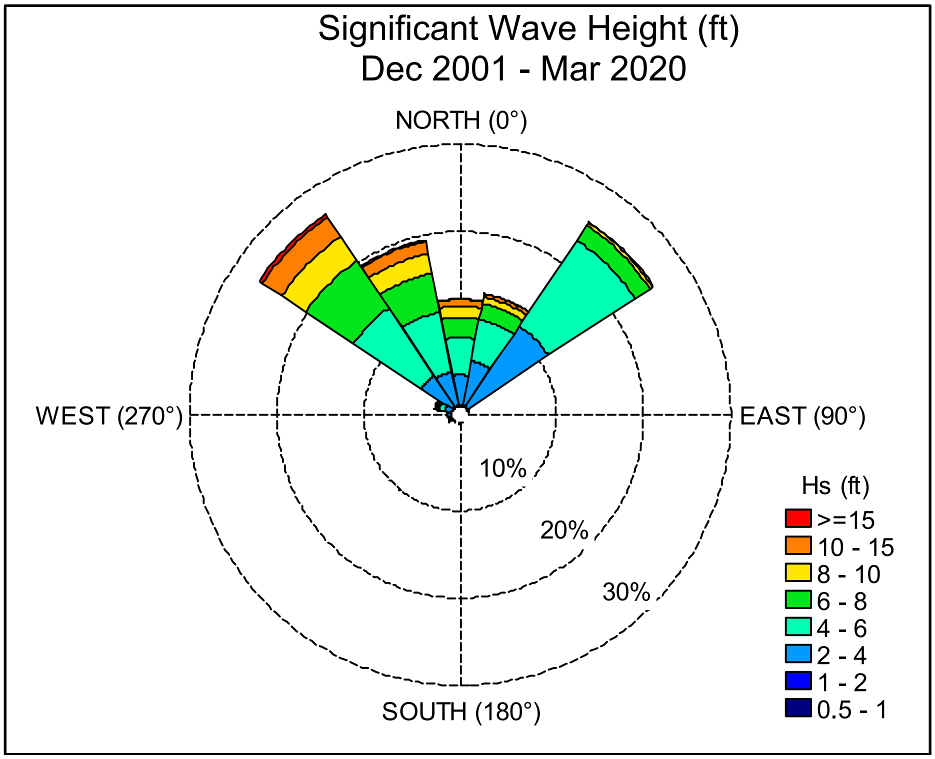


Figure 3-6. Parametric wave height data for CDIP 106

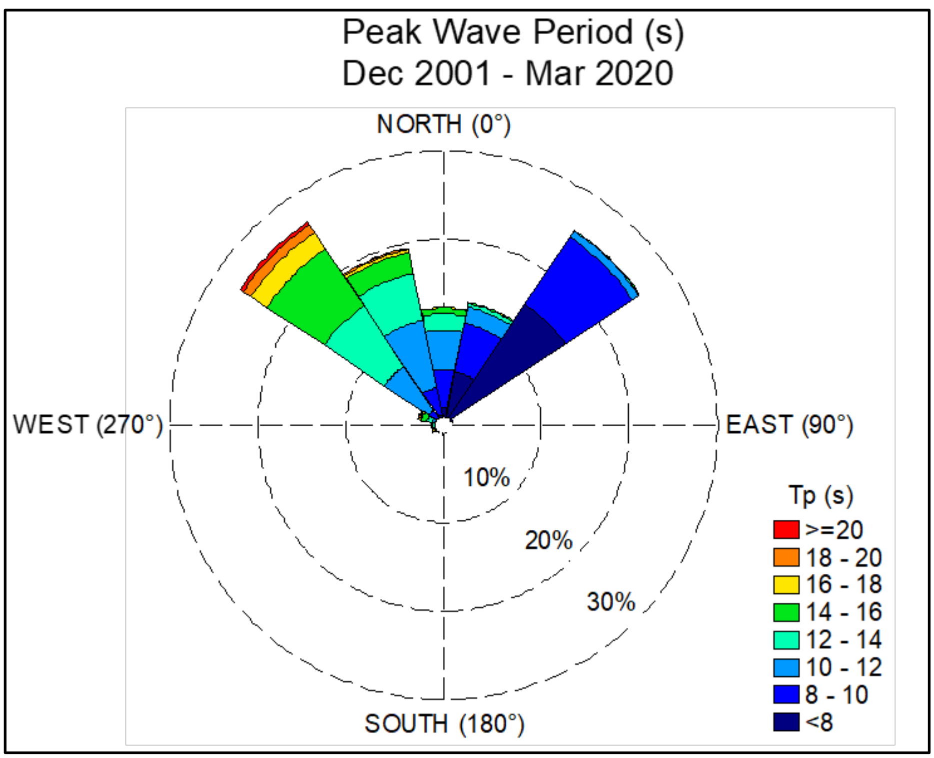


Figure 3-7. Parametric wave period date for CDIP 106

From Figure 3-6 and Figure 3-7, the North Shore wave climate has the following characteristics:

- There are no waves from the south because of island shadowing;
- Predominant wave directions are from the northwest (North Pacific swell) and northeast (trade wind waves);
- North Pacific swell has much greater wave heights and longer wave periods than trade wind waves, but the frequency of occurrence is approximately the same.

Figure 3-8 is a wave height rose diagram from CDIP 106 showing the winter wave climate (December-March) only. Figure 3-9 is the corresponding diagram showing the summer wave climate.

The two diagrams show:

- Dominant wave conditions for winter and summer have arrival directions that are approximately 90 degrees apart, or NW for winter and NE for summer. This shift accounts for the seasonal alongshore sand migration.

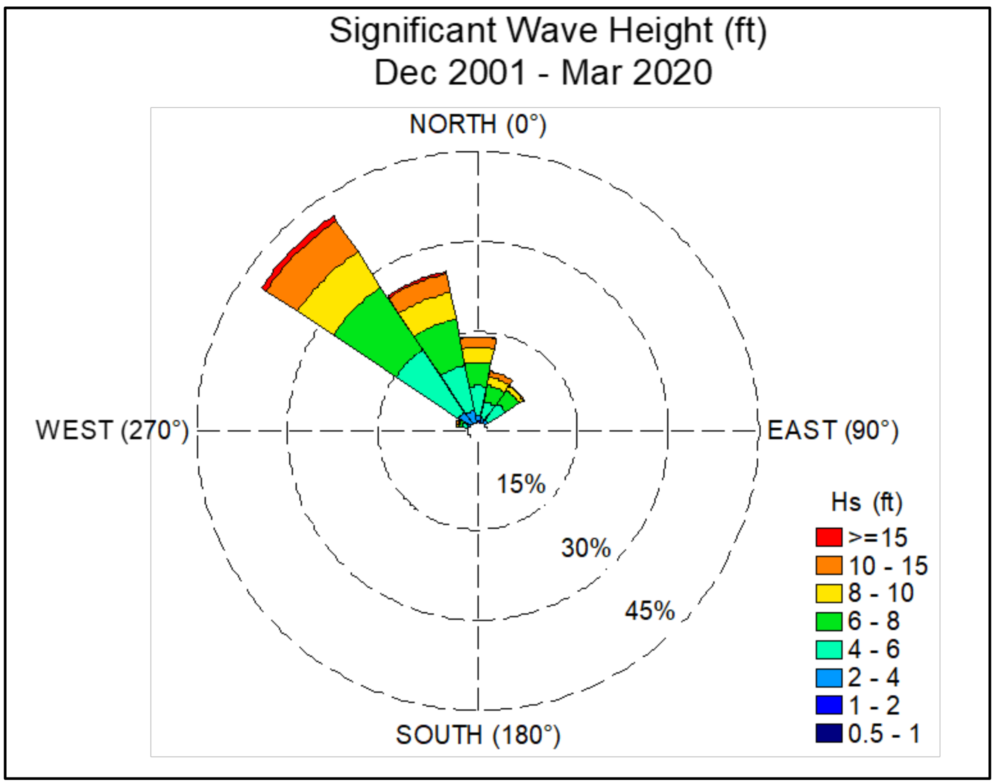


Figure 3-8. Winter wave climate from CDIP 106

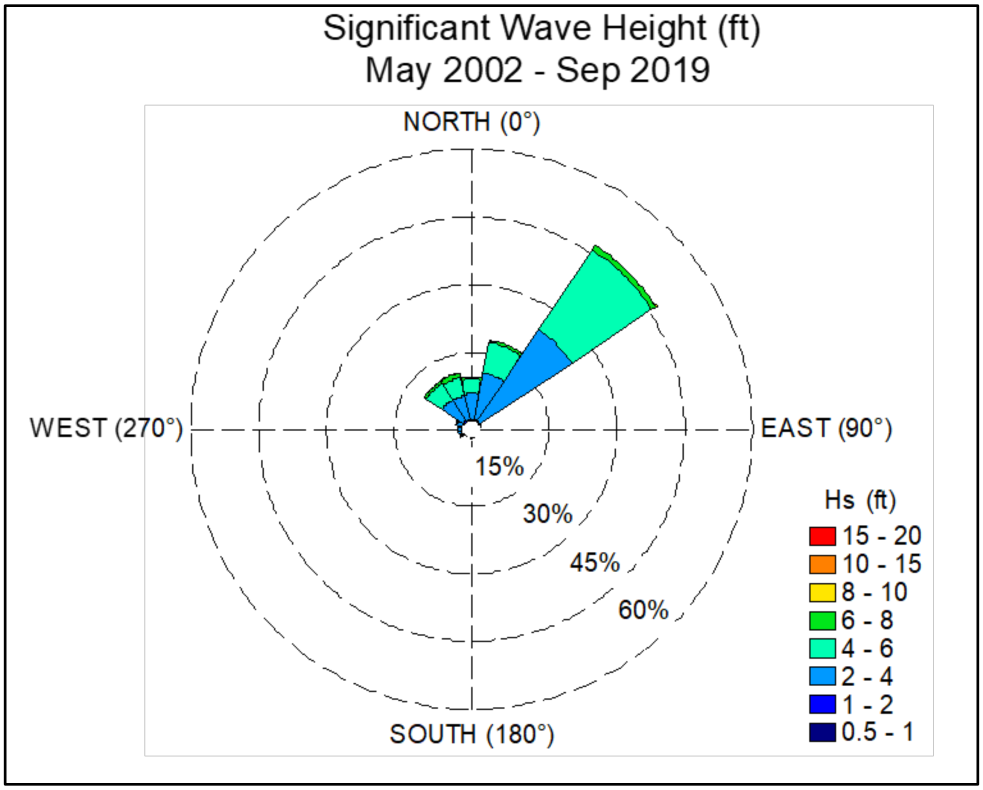


Figure 3-9. Summer wave climate from CDIP 106

Figure 3-10 is a winter season diagram for spectral data from virtual buoy HNL 106, again showing the strong prevailing wave climate from the northwest. The more exposed location shows trade wind waves coming from a more easterly direction, indicating that trade wind waves shown at buoy CDIP 106 are diffracted into the lee of Kahuku Point. The diagram also shows waves coming from a westerly direction. This result is due to the spectral analysis method that shows waves that might otherwise be hidden by the dominant northwest wave direction.

The North Shore wave climate can be described as bimodal and seasonal: there are two very different prevailing wave types, one of which occurs predominately in the winter, with the other occurring year-round. North Pacific Swell are long period (long interval) waves derived from distant winter storms, while trade wind waves are short period (short interval) waves derived mostly from local trade wind generated seas. The seasonal differences play a large role in the seasonal sand migrations on the North Shore beaches.

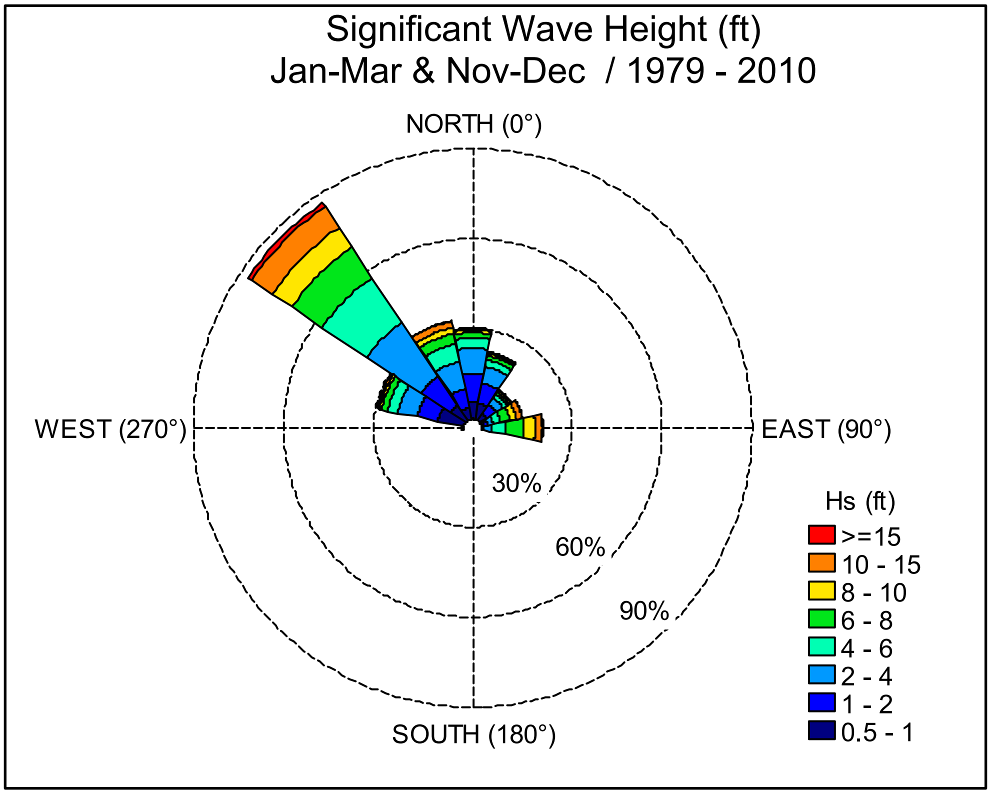


Figure 3-10. Winter season wave climate from virtual buoy HNL 10

3.3.3 *Extreme Deepwater Waves*

Historical wave buoy data allows the prediction of extreme wave events. These are infrequent, large, powerful, low probability wave events that are typically used for design purposes. For example, a 50-year return period wave event is an extreme event with a 1/50 (i.e., 2%) chance of occurring in any given year. Extreme wave heights were investigated using the measured data from CDIP 106.

The extreme wave height data were used to generate a Weibull extreme value distribution for return period wave heights. The Weibull Distribution is a tool for looking at the relationship between the size of waves and how frequently they occur at a given location. Analysis requires a long-term data set with well-documented wave events. These events are sorted by size, and frequency of occurrence can be assessed by how often these events occur in the record (Table 3-4). The extreme value deep water wave heights are sorted by return period in Table 3-5. Breaking waves can be much larger because of the effects of refraction and shoaling. The significant wave height value (Hs) is defined as the average of the highest third of the wave heights present, and much larger waves can be present sporadically during the wave event.

Table 3-4. Ten Largest Wave Events

Date	Hs (ft)	Tp (s)	Dp (deg)
2/11/2019	29.8	15.4	334
2/22/2016	27.8	16.7	325
1/23/2014	24.3	18.2	307
1/5/2003	23.6	18.2	319
12/4/2007	22.0	15.4	339
1/16/2016	21.8	16.7	324
1/10/2004	21.5	18.2	318
1/7/2002	21.4	18.2	315
3/14/2009	21.1	15.4	10
12/8/2009	21.1	18.2	325

Table 3-5. Return Period Wave Heights

Return Period (years)	Hs (ft)
1	19.7
2	22.0
5	25.1
10	27.4
25	30.4
50	32.7

4. COASTAL HAZARDS

4.1 Introduction

Figure 4-1is a comprehensive image showing the hazard potential for the Haleiwa area, including Kawailoa Beach. The overall hazard intensity is rated as 5 with the maximum being 7. The area is particularly susceptible to tsunami, stream flooding and high waves.

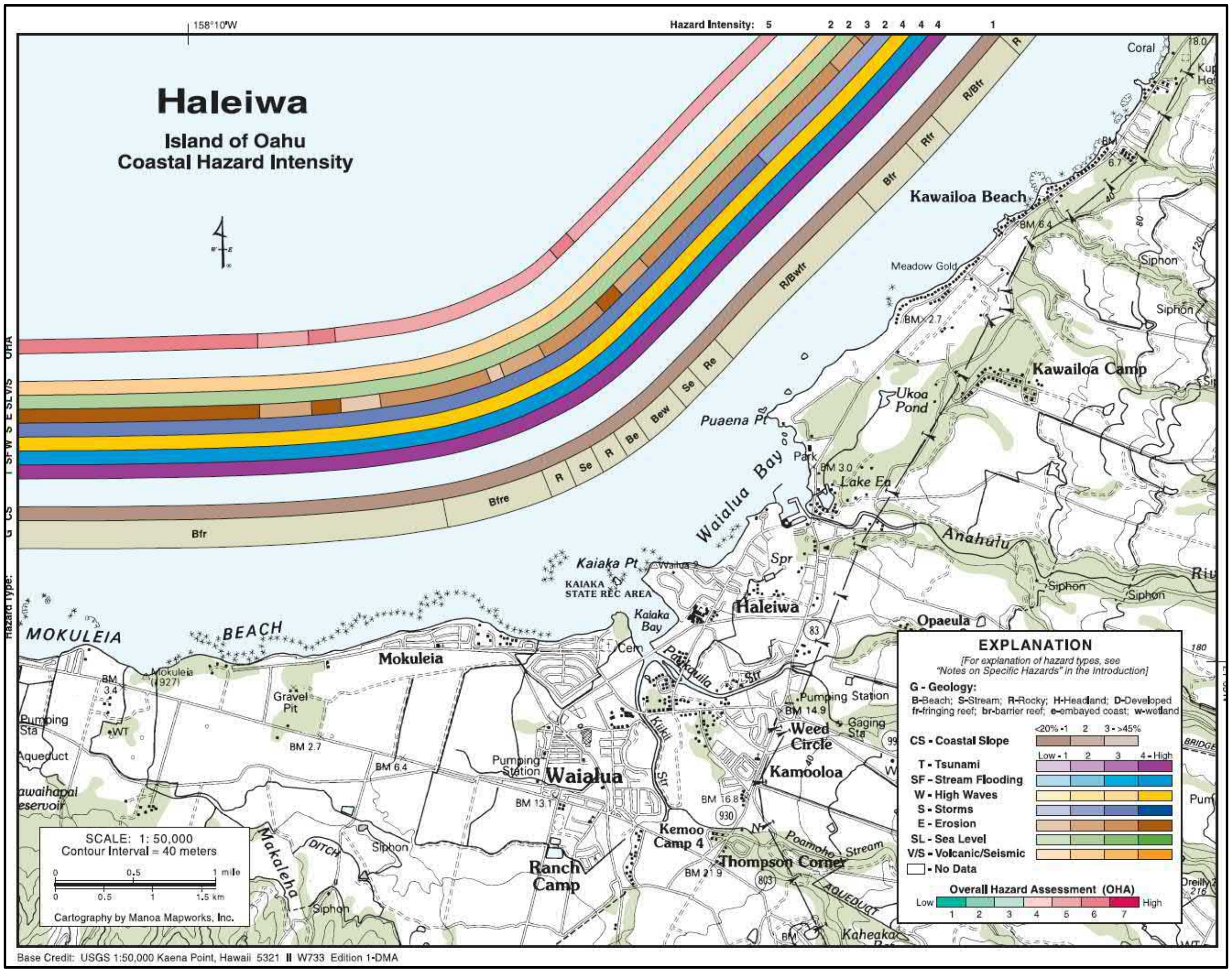


Figure 4-1. Coastal hazards atlas for Haleiwa area (from Fletcher and others, 2002)

4.2 Hurricanes

Tropical cyclones originate over warm ocean waters, and they are considered hurricane strength when they generate sustained wind speeds over 64 knots (74 mph). Hurricanes that form near the equator, and in the central North Pacific usually move toward the west or northwest. During the primary hurricane season of July through September, hurricanes generally form off the west coast of Mexico and move westward across the Central Pacific. These storms typically pass south of the Hawaiian Islands and sometimes have a northward curvature near the islands. Late season hurricanes follow a somewhat different track, forming south of Hawaii and moving north toward the islands. Three hurricanes have passed through the Hawaiian Islands in the past 25 years: Hurricanes Iwa in 1982 and Iniki in 1992, both passing near or over the island of Kauai as well as

Hurricane Iselle in 2014 passing over the island of Hawaii. These storms caused high surf and wave damage on multiple shores of the islands. However, many others have had a close approach.

The *Windward Oahu Hurricane Vulnerability Study* (Sea Engineering, 1990) indicates that a theoretical model hurricane passing over the island from the south/southwest could result in deep-water waves 44.2 feet in height with periods of 14.6 seconds for Oahu's north and east shores. The Hawaiian Islands are annually exposed to severe storms and waves generated by tropical cyclonic storms (hurricanes).

While it is not uncommon for hurricanes to pass near Hawaii, they often change course or deteriorate by the time they reach Hawaiian waters. Figure 4-2 shows the historical tracks of tropical storms and hurricanes in the central Pacific from 1949 to 2018. While direct hits to the Hawaiian Islands are rare, hurricane tracks to the north or south of the islands are not infrequent and can generate large, damaging waves which can have impacts along the shorelines throughout Hawaii. The historical tracks of hurricanes that have passed near the Hawaiian Islands from 1949 to 2018 are shown in Figure 4-3. The tracks of tropical storms and tropical depressions that have passed near Hawaii are shown in Figure 4-4.

Hurricane Iwa (1982) and Hurricane Iniki (1992) caused significant damage in Hawaii. They have been well-studied and the characteristics of these storms were significantly different from each other. Hurricane Iwa was not as intense as Hurricane Iniki, however Iwa was a much larger storm with an estimated radius of maximum winds of 51 nautical miles (nm) compared to 13 nm for Hurricane Iniki. Hurricane Iwa approached Kauai from the southwest and was a large Category 1 hurricane when it passed northwest of the island with maximum sustained wind speeds of 80 knots (92 mph). While Hurricane Iwa was a Category 1 event throughout its life near the Hawaiian Islands, Hurricane Iniki approached as a Category 4 and reverted to Category 3 just prior to making landfall on Kauai with maximum sustained wind speeds of 116 knots (113 mph). Wave heights, coastal inundation, and damage on the south shore of Oahu were reported to be similar for both Hurricane Iwa and Hurricane Iniki, with waves on the order of 30 ft in height reported for both storms.

Recent years have shown an increase in hurricane activity around Hawaii. The 2014 hurricane season was notable for the passage of three hurricanes near the islands, with one (Hurricane Iselle) making landfall on August 7 on the east shore of Hawaii Island as a tropical storm with maximum sustained wind speeds of 61 knots (70 mph). A few days later, Hurricane Julio passed north of the Hawaiian Islands as a tropical storm, causing little damage. Hurricane Ana passed south of the Hawaiian Islands in October and caused little damage, although large waves were recorded on the south shore of Oahu.

The 2015 hurricane season was the second most active Pacific hurricane season on record behind the 1992 season (Hickey 2016). In August 2015, Hurricanes Kilo, Ignacio, and Jimena had sustained winds between 113 to 122 knots (130 to 140 mph). This was the first time in history that three Category 4 hurricanes existed simultaneously east of the International Date Line (National Hurricane Center, 2015). Radar imagery from this event is shown in Figure 4-5. In 2018, Hurricane Lane resulted in a hurricane warning forecasting potential landfall on the south shore of Oahu. The stormed stalled west of Hawaii Island and rapidly dissipated but still caused damage across the eastern half of the state. Satellite imagery of Hurricane Lane's approach to

Hawaii is shown in Figure 4-6 . Hurricane Norman passed north of Oahu but damaged some of the north shore beaches. Hurricane Olivia downsized to a tropical storm just prior to passing directly over West Maui. Hurricane Walaka generated large surf on the west and south shores of Oahu. Although these hurricanes resulted in little damage on Oahu, minor changes in the 2014, 2015, or 2018 storm tracks could have resulted in very different outcomes, and they serve as reminders of Hawaii's vulnerability.

Figure 4-2. Central Pacific historical hurricane tracks (1949 to 2018)

Source: https://coast.noaa.gov/hurricanes/

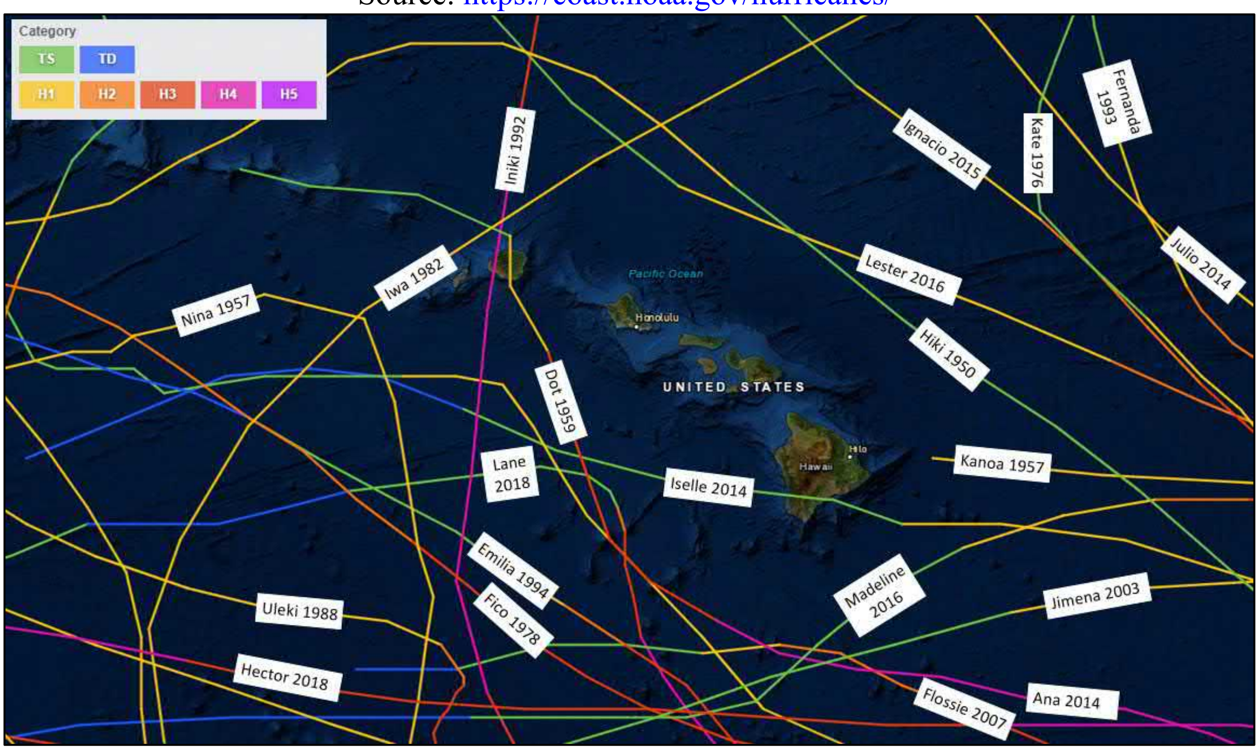


Figure 4-3. Hawaii historical hurricane tracks (1949 to 2018)

Source: https://coast.noaa.gov/hurricanes/

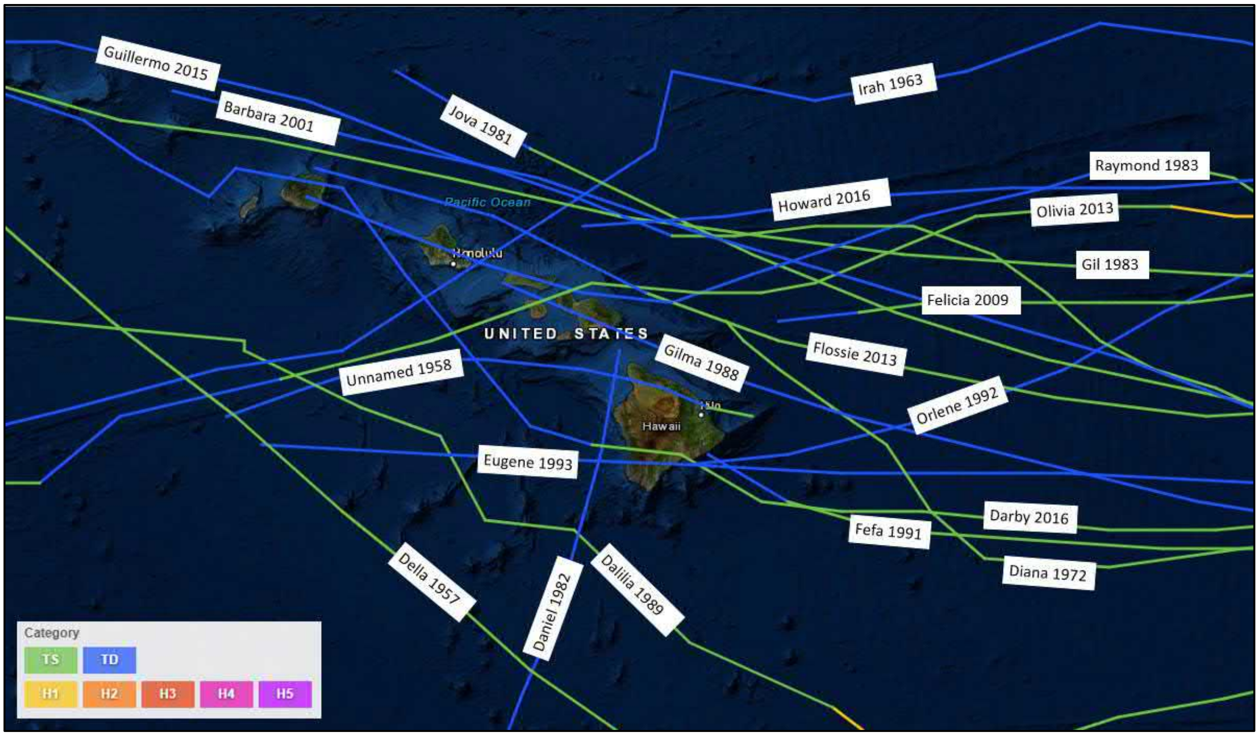


Figure 4-4. Hawaii historical tropical storms and depressions (1949 to 2018)

Source: https://coast.noaa.gov/hurricanes/

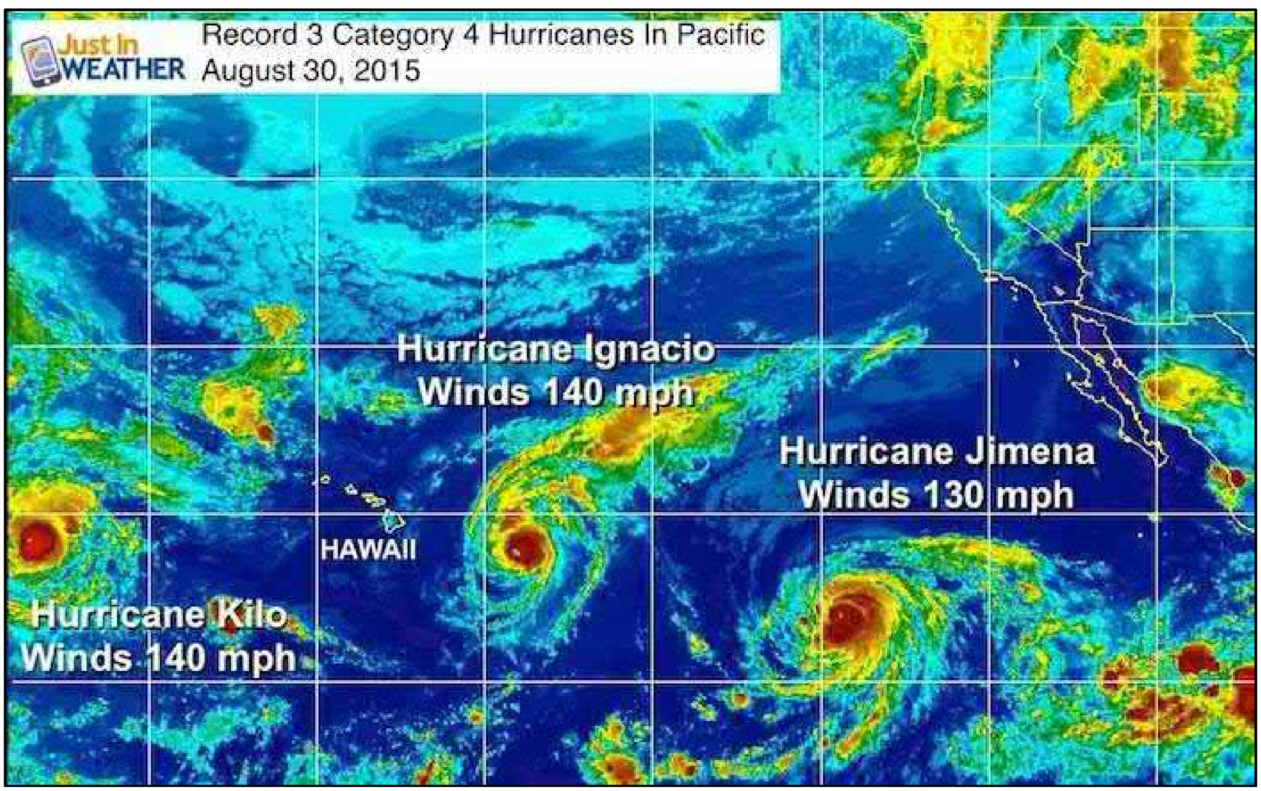


Figure 4-5. Radar image of three Category 4 hurricanes in the Pacific (August 2015)

Source: https://www.justinweather.com/

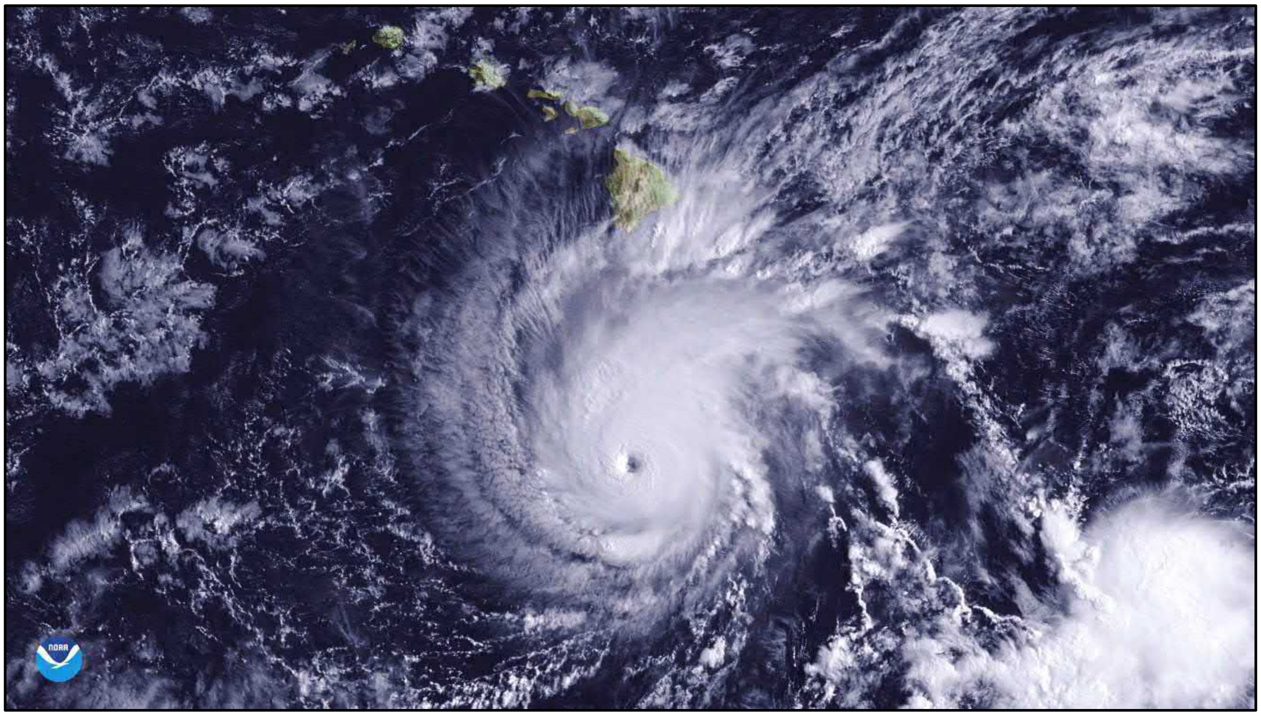


Figure 4-6. Satellite image of Hurricane Lane approaching Hawaii (August 2018)
Source: NOAA Environmental Visualization Laboratory

4.2.1 *Hurricane Storm Surge*

Hurricane Iwa and Hurricane Iniki generated storm surge above 1 ft in the tidal record at Honolulu Harbor. Based on the recorded data at the tide station, storm surge in Honolulu Harbor from Hurricane Iwa peaked at approximately 1.8 ft, with a maximum recorded water level reaching 2.3 ft. During Hurricane Iniki, the storm surge peaked at approximately 1.5 ft with a maximum recorded water level of 3.2 ft. Measured and predicted tides during Hurricane Iwa are shown in Figure 4-7 and the storm surge is shown in Figure 4-8. Figure 4-9 and Figure 4-10 show the tides and storm surge during Hurricane Iniki. Two interesting observations can be made from the time series. The first is that the peak storm surge lasts a few hours while the bulk of the storm surge persists on the order of 12 hours. While this is representative for similar storm tracks, it may not always be the case. The second observation is the impact of tide levels at the time of the storms. Hurricane Iwa caused peak storm surge during low tide while Hurricane Iniki's peak storm surge occurred during high tide. As a result, the maximum water level during Hurricane Iniki was approximately 1 ft higher than the maximum water level during Hurricane Iwa, even though Hurricane Iniki had a smaller amplitude storm surge.

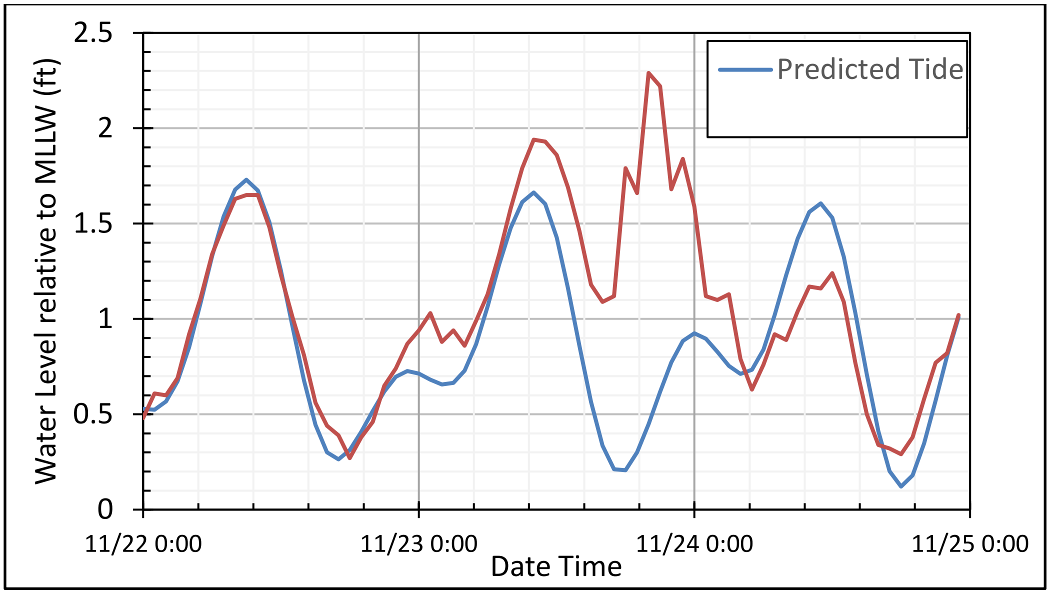


Figure 4-7. Predicted and measured tide at Honolulu Harbor during Hurricane Iwa

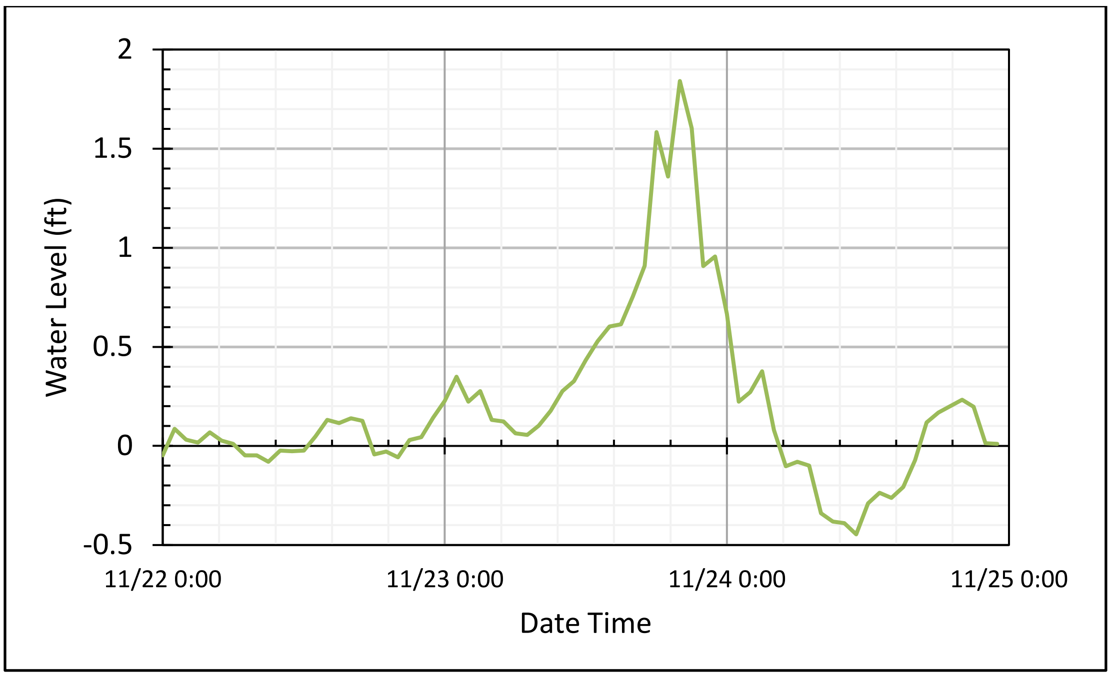


Figure 4-8. Sea level anomaly at Honolulu Harbor during Hurricane Iwa.

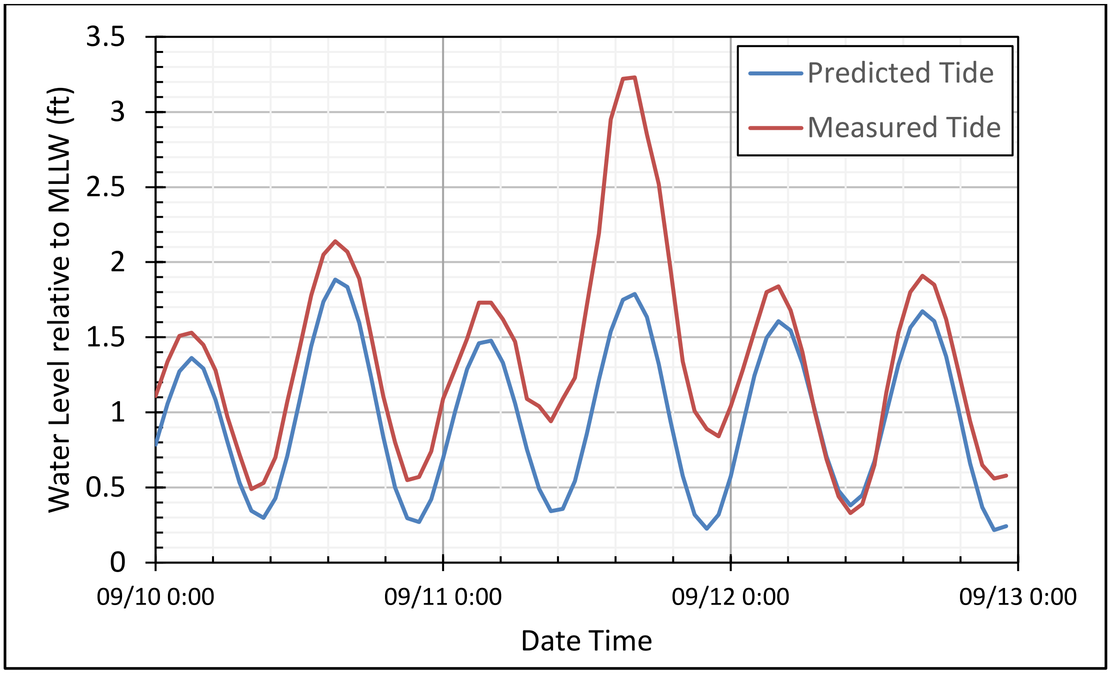


Figure 4-9. Predicted and measured tide at Honolulu Harbor during Hurricane Iniki

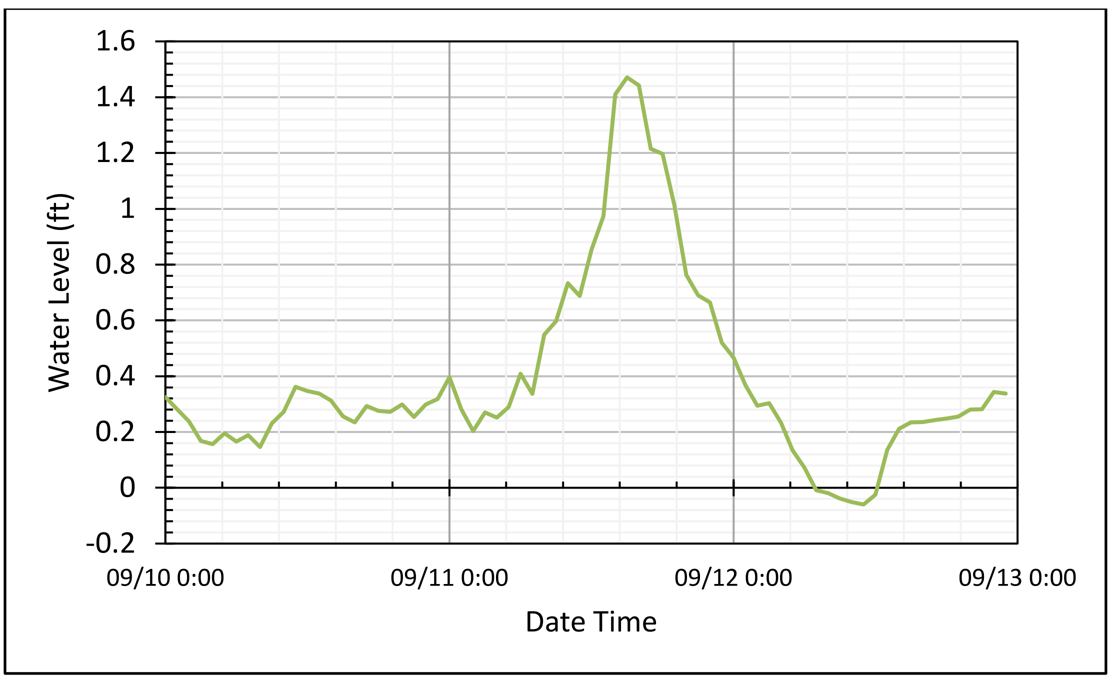


Figure 4-10. Sea level anomaly at Honolulu Harbor during Hurricane Iniki

4.3 Kona Storms

Kona storms are caused by the close approach of mid-latitude low pressure systems. Occasional strong Kona storms have caused extensive damage to the south- and west-facing shorelines on Oahu. Deepwater wave heights during a severe Kona storm in January 1980 were about 17 feet with a period of 9 seconds.

4.4 Tsunami

Tsunami are waves that result from large-scale movement of the seafloor, underwater slides, or other phenomena that cause large displacements of water. They are commonly caused by large magnitude earthquakes (typically magnitude 7.0 or greater). Tsunami often travel outwards in a series of waves which occupy the entire water column, even at abyssal depths. Tsunami waves typically have small wave heights in deep water but can have wavelengths of hundreds of miles and travel at speeds up to 500 miles per hour. A tsunami can travel from one side of the Pacific to the other in less than a day. The speed decreases rapidly as the water shoals. The waves increase greatly in height as they shoal and tsunami runup can push far inland at high speed. Receding waters may also have considerable speed, and the recession often causes as much damage as the original wavefront itself.

Most tsunamis in Hawaii originate from the tectonically active areas located around the Pacific Rim (e.g., Alaska, Japan, and Chile). Waves created by earthquakes in these areas take hours to reach Hawaii, and the network of sensors that is part of the Pacific Tsunami Warning System can provide Hawaii with several hours advance warning prior to the arrival of tsunami waves generated from these locations. Less commonly, tsunami originate from seismic activity in the Hawaiian Islands, and there is less warning for these locally generated events.

In 1946, a tsunami was generated in the Aleutian Islands and was one of the most destructive tsunamis to strike Hawaii. The U.S. Geological Survey (Fletcher et al., 2002) has given the project area a tsunami hazard rating of 4 out of 4 **(**Figure 4-1**).**

Historical tsunami runup in Haleiwa has been recorded as far back as 1878. Table 4-1 is a list of recorded tsunami runup data for the Haleiwa area.

Table 4-1. Historic Tsunami Runup For Haleiwa

Year	Runup (ft)	Source Area
1878	9	Aleutian Islands
1923	12	Kamchatka
1946	11	Eastern Aleutian Islands
1952	17	Kamchatka
1957	17	Central Aleutian Islands
1964	15	Gulf of Alaska
1994	2	Kuril Islands
2011	?	Japan (Tohoku)

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), maintains flood hazard maps for use in determining a reference height used by property insurance companies to assess flood risk, known as the Base Flood Elevation (BFE). On the North Shore of Oahu, Hawaii, the 1% annual flood risk is considered by FEMA to be a result of tsunami wave inundation, and not from rainfall accumulation or hurricane innundation. The North Shore flood zones were determined in a 1979 study utilizing the method presented in the "*Manual for Determining Tsunami Run-up Profiles on Coastal Areas in Hawaii*", a U.S. Army Corps of Engineers (USACE) manual prepared by M&E Pacific, Inc.

SEI conducted a runup study using the same methodology as the USACE manual, but with a much higher transect density of 130 ft (40 m) between transects instead of the previous study spacing of hundreds of meters (see SEI 2020). The updated SEI study added the altered ground topography for the two bypass alternatives, the Pedestrian Shift, and the Most alignment alternative. Figure 4-11 is the Flood Insurance Rate Map (FIRM) showing the BFE for most of the project area. Maximum BFE is 23 ft in the VE zone (velocity hazard due to wave action). The VE zone is narrow and confined to the beach area in the storm berm reach (see Section 2.6.3) but broadens and moves inland across the lower revetment reach. Inland areas are AE zone with BFE's of 18 and 20 ft.

Figure 4-12 is the FIRM map data simplified and oriented for comparison with the SEI analysis. The SEI analysis for existing conditions is shown in Figure 4-13 overlain on the FIRM BFE map. While the SEI map is more detailed, the general trends and BFE values are similar. A notable WSE decrease at Transect 11 is due to a stream crossing that was not accounted for in the previous study.

Figure 4-14 shows the SEI analysis for the Pedestrian Shift alternative (Alternative 1). The results are similar to the existing case, with marginal differences noted in the stream crossing area and the adjacent realigned roadway near Transect 11 and Transect 12. Figure 4-15 is a plot of the contour differences between Figure 4-14 and Figure 4-15, showing the limited areal extent of the differences. Figure 4-16 is plot of Transect 12 that shows the differences in the inundation elevation. There are slight increases in the WSE (on the order of 1 ft), over some roadway areas, and slight decreases (less than 1 ft) over a broad but limited area landward of the roadway. The maximum inland extent of inundation increased significantly at only one location, Transect 20, which runs through Turtle Beach near Pu'u Nenue. At this location, the new Alternative 1 alignment rejoins the original highway and the horizontal inundation increases by approximately 82 ft. The increase is caused by a high spot in the existing topography that is leveled for the new alignment.

Figure 4-17 is a plan view plot of the tsunami inundation WSE for the Most alternative (Alternative 2), and Figure 4-18 is a difference analysis between the existing conditions (Figure 4-13) and Alternative 2 (Figure 4-17). In contrast to Alternative 1, there are some significant inundation changes due to the proposed new alignment for Alternative 2, with elevation increases of up to 5 ft over the new road deck toward the southern end of the project area between Transect 9 and Transect 13. On Transect 11 (Figure 4-19) the increase is approximately 2.5 ft. Landward of the roadway the elevation increase is less, on the order of 1 ft. There are additional minor changes at the north end of the alignment in the vicinity of transects 28 and 29, and also Transect 32, with both areas having a WSE increase on the order of 1 to 2 ft. The WSE increase on Transect 32 is approximately 100 ft landward of a private residence.

The rise in grade due to the proposed roadway and associated earthworks of Alternative 2 cause some notable decreases in the horizontal inundation extent, in contrast to Alternative 1. At Transects 13 – 15 and 28 – 31 the increase in grade of the proposed road deck blocks further landward propagation of the tsunami. Figure 4-20 is a plot of horizontal inundation differences for both alternatives.

Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 6-1-005:023
WATERSHED:	KEAMANEA; LOKO EA
PARCEL ADDRESS:	ADDRESS NOT DETERMINED HALEIWA, HI 96712

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL - EFFECTIVE DATE:	15003C0105H - JANUARY 19, 2011 15003C0110F - SEPTEMBER 30, 2004

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: YES
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

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

0 400 800 ft

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

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

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

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

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

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

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

OTHER FLOOD AREAS

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

Figure 4-11. FEMA Flood Hazard Assessment Report (FHAR) for Kawailoa

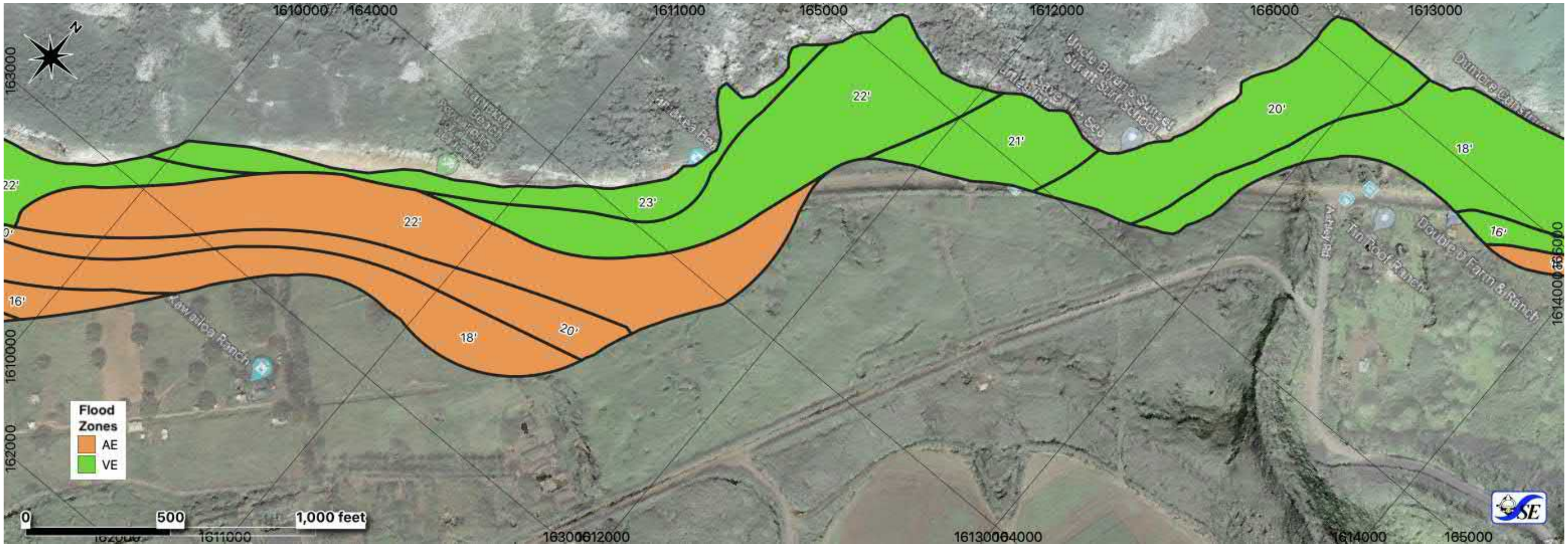


Figure 4-12. FIRM BFE contours.

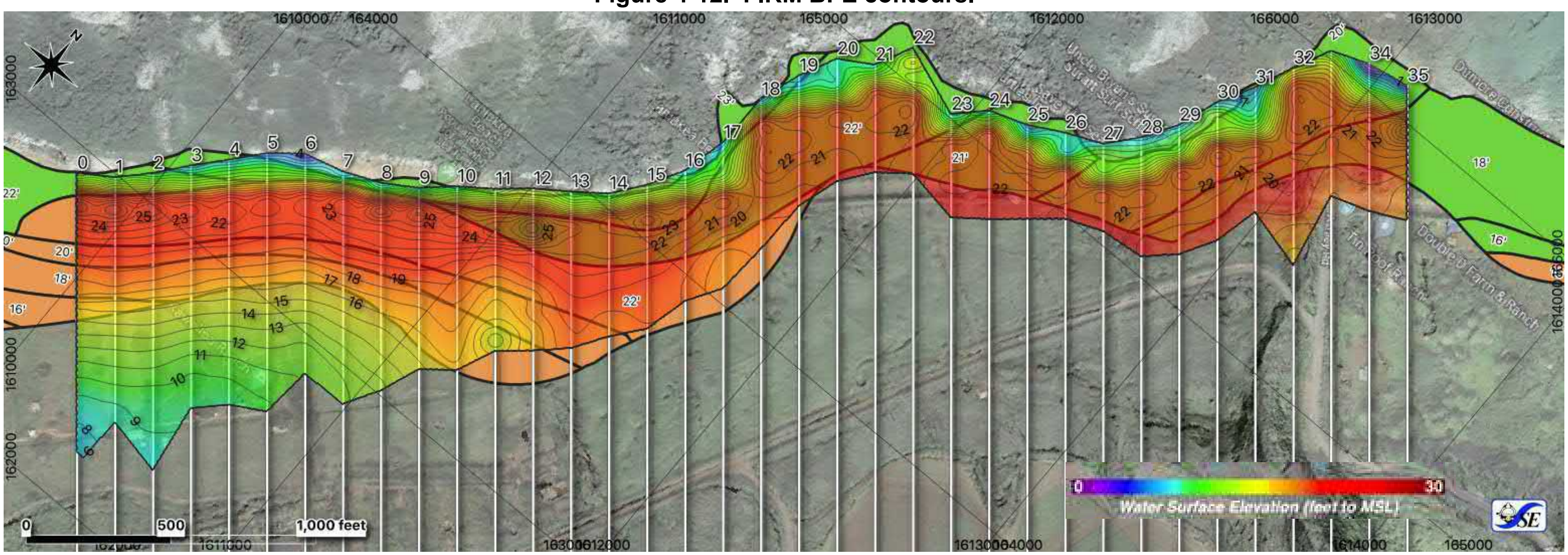


Figure 4-13. SEI analysis overlaid on the FIRM contours

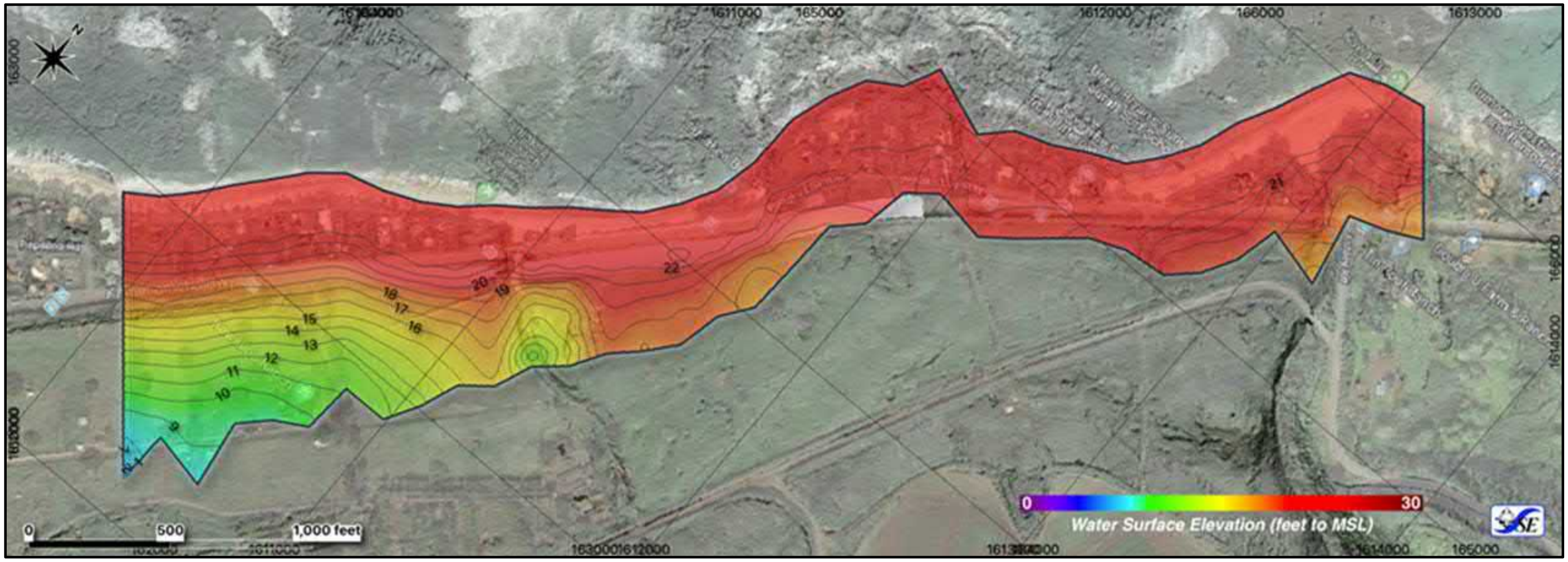


Figure 4-14. SEI analysis with Pedestrian Shift alternative (Alternative 1)

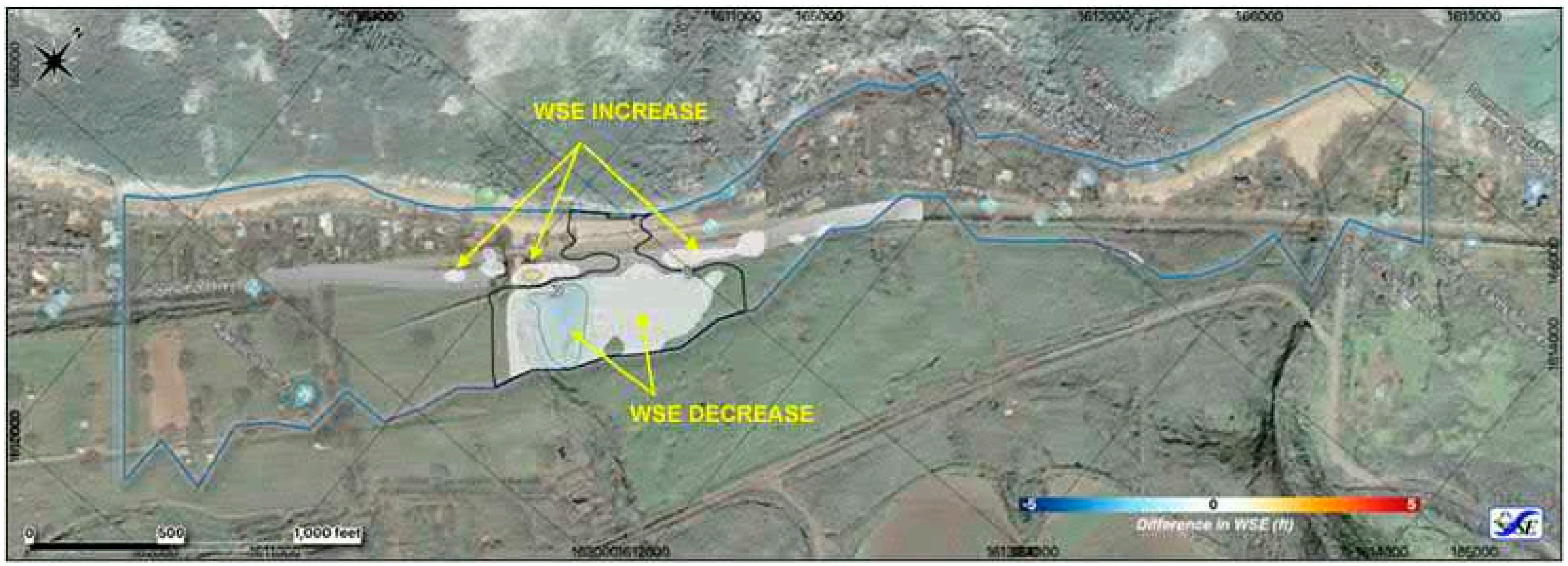


Figure 4-15. WSE elevation difference analysis between existing condition analysis (Figure 4-13) and Alternative 1 analysis (Figure 4-14)

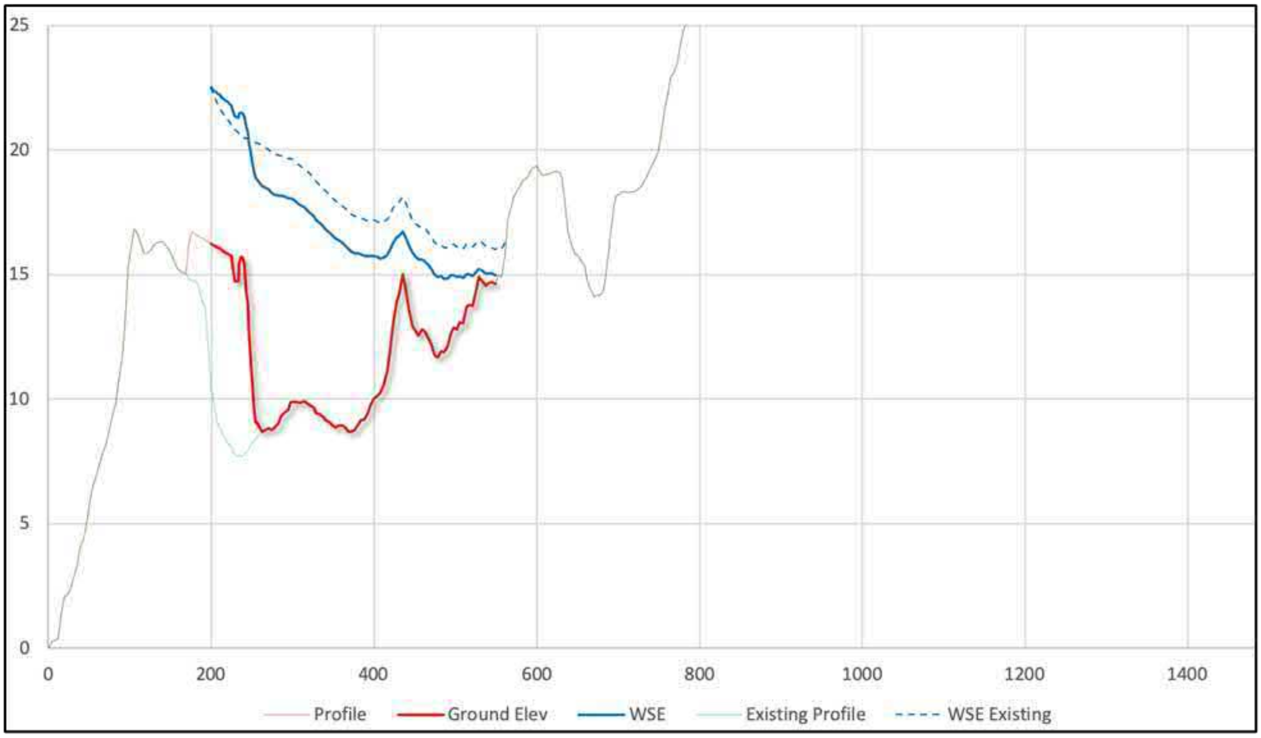


Figure 4-16. Plot of Transect 12 showing the WSE for Alternative 1 (blue) versus the existing WSE (dashed)

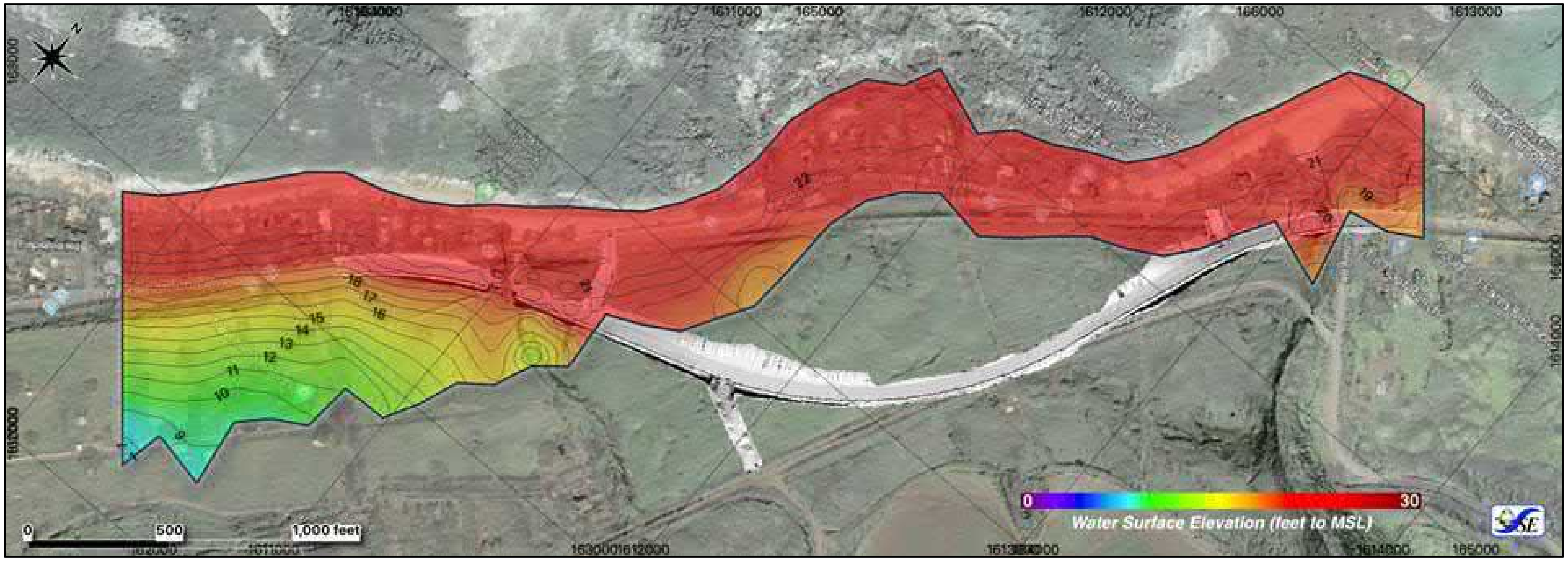


Figure 4-17. SEI analysis with Most alternative (Alternative 2)

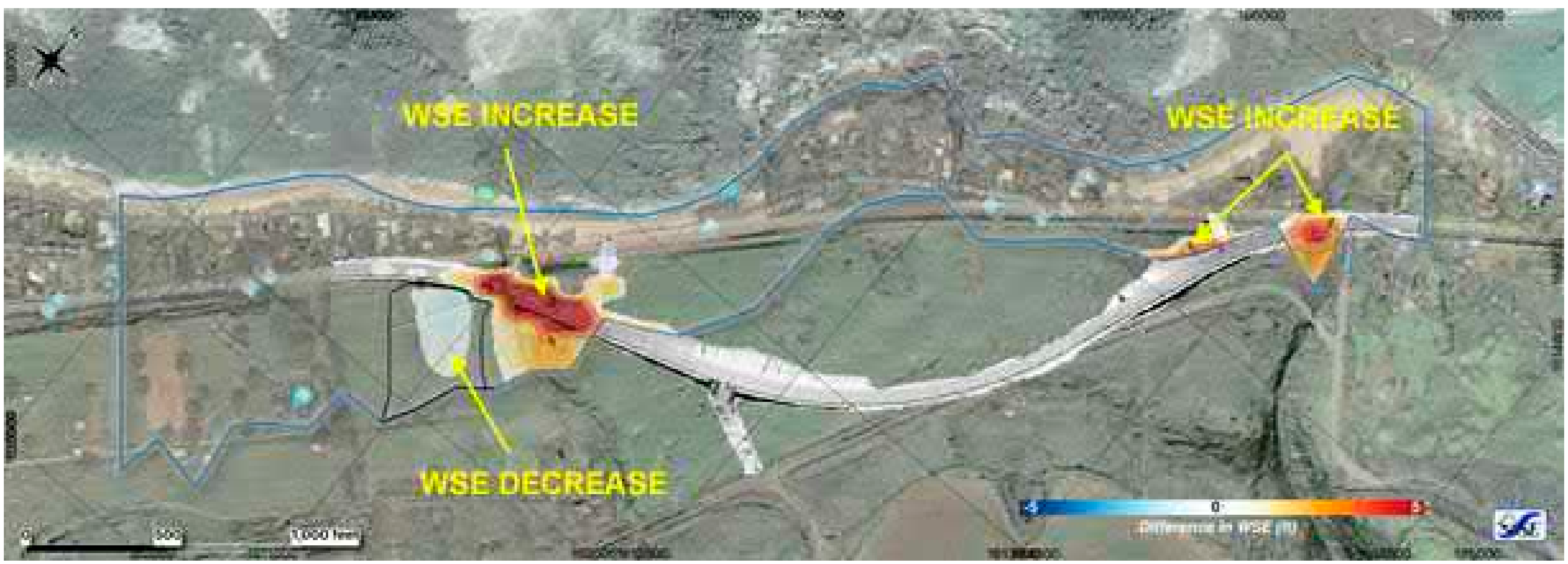


Figure 4-18. Difference analysis between existing condition (Figure 4-13) and Alternative 2 (Figure 4-17)

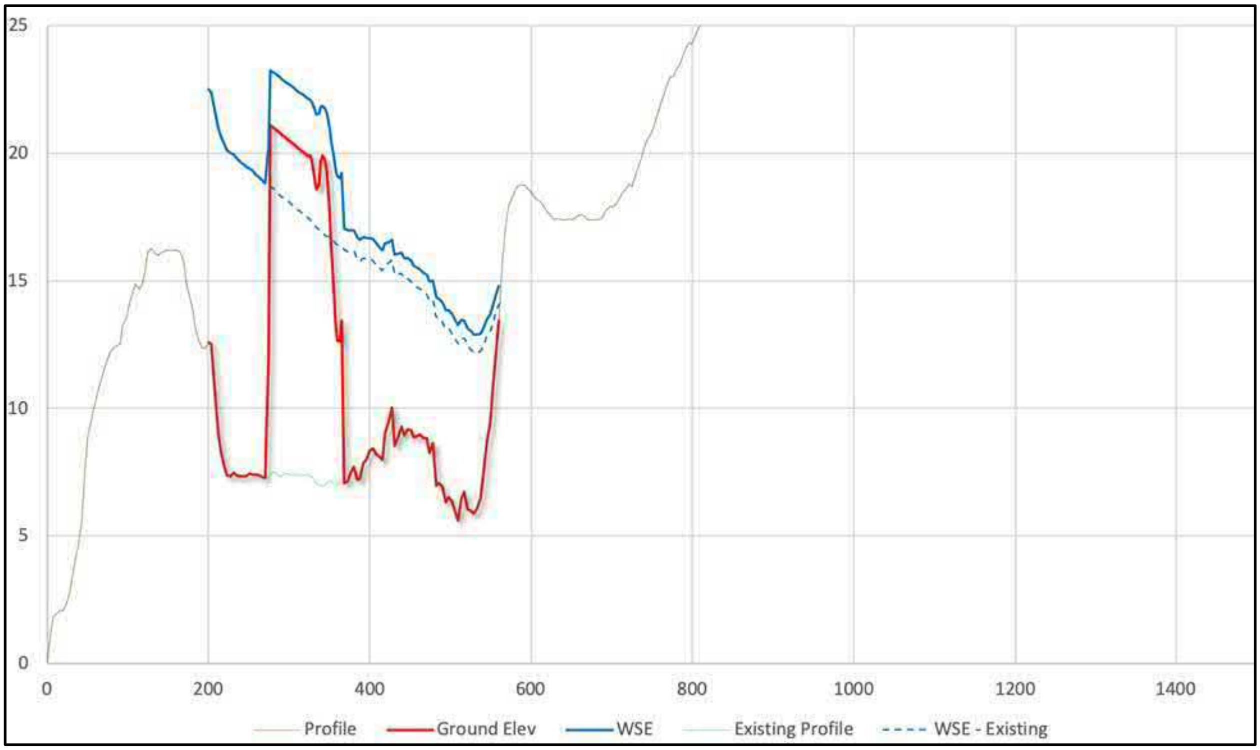


Figure 4-19. Transect 11 analysis for Alternative 2 showing WSE increase over the road

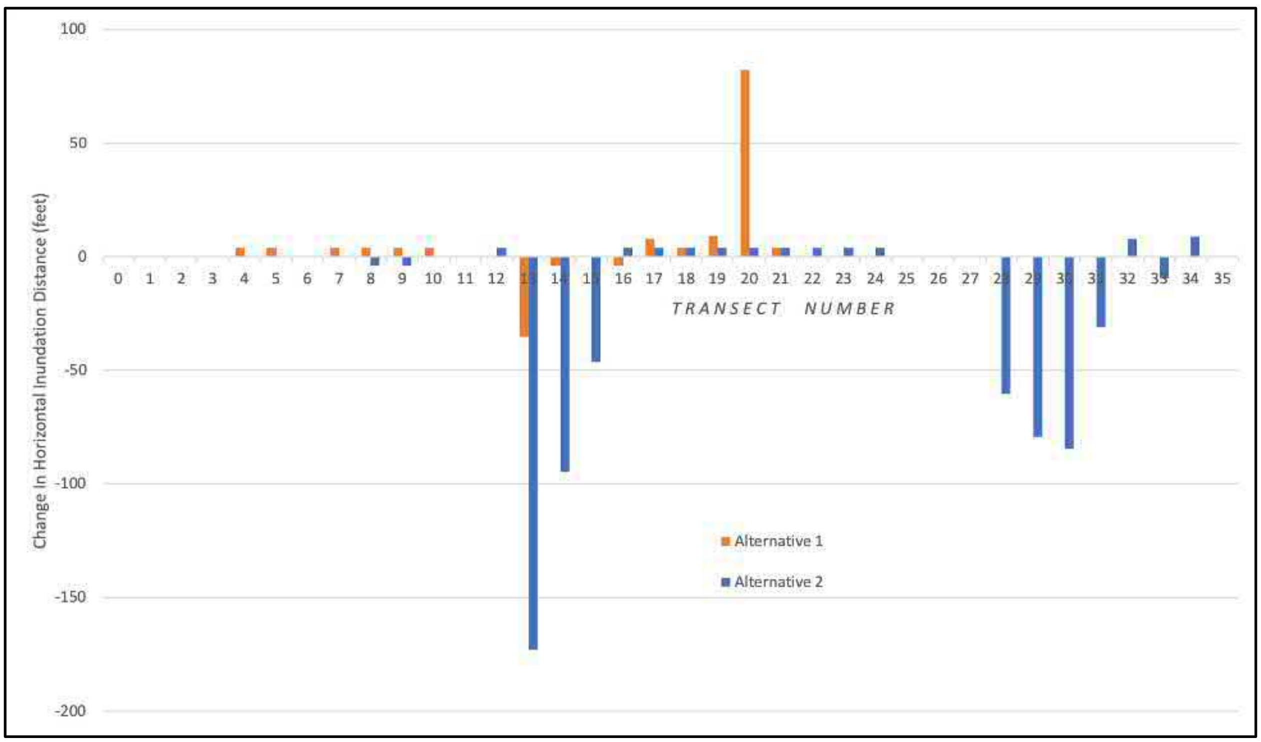


Figure 4-20. Horizontal inundation distance change between existing topography and Alternative 1 and Alternative 2 conditions

4.5 Sea Level Rise

4.5.1 *Global Sea Level Rise Predictions*

Greenhouse gas (GHG) emissions are a driving factor behind the increase in global temperature and sea level rise. In order to quantify the potential risks of global warming, the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5; Church et al. 2013a) establishes four cases representing the climate response to GHG emission levels from different socioeconomic scenarios, referred to as Representative Concentration Pathways (RCPs). The four RCP scenarios are RCP 2.6, RCP 4.5, RCP 6.0, and RCP 8.5. RCP 2.6 requires a strong proactive approach to reduce GHG in the first quarter of the 21st century and includes at least modest active carbon dioxide (CO_2) removal from the atmosphere. RCP 4.5 represents moderate mitigation of emissions through the mid-21st century and declining thereafter. RCP 6.0 represents a second moderate mitigation policy scenario with emissions peaking higher than RCP 4.5 and less mitigation through the end of the 21st century. RCP 8.5 can be viewed as corresponding to high-end business-as-usual emissions (Kopp, 2014).

GHG emissions are currently correlated with the RCP 8.5 scenario. The IPCC predictions for future GHG emissions and their effect on global temperatures is shown in Figure 4-21. The corresponding increase in global surface temperatures are shown in Figure 4-22. It is important to note that the IPCC predictions show that, even if global GHG emissions are dramatically reduced, global temperatures will continue to rise.

In 2017, NOAA revised their global projections for relative sea level change through 2100 (Sweet et al. 2017). The study updates the commonly used values presented in the IPCC Fifth Assessment Report (AR5). It is common to see studies site the high-end prediction AR5 global sea level rise values of 0.98 m (3.2 ft) in 2100. The values presented in the AR5 represent the central or 'likely' range of 21st century sea level rise. The IPCC defines the 'likely' range as having at least a 66% probability of occurrence. This leaves a large uncertainty for higher sea level rise scenarios with lower probability of occurrence (Sweet et al. 2017).

To allow planners to make a more complete risk assessment in coastal areas, the NOAA (Sweet et al. 2017) study established six global mean sea level (GMSL) rise scenarios by 2100 (Table 4-2). Global changes in mean sea level are the starting point of the NOAA study. Due to ocean dynamics on a planetary scale, it is projected that Hawaii will experience a higher increase in sea level than the global mean (see Section 4.5.2).

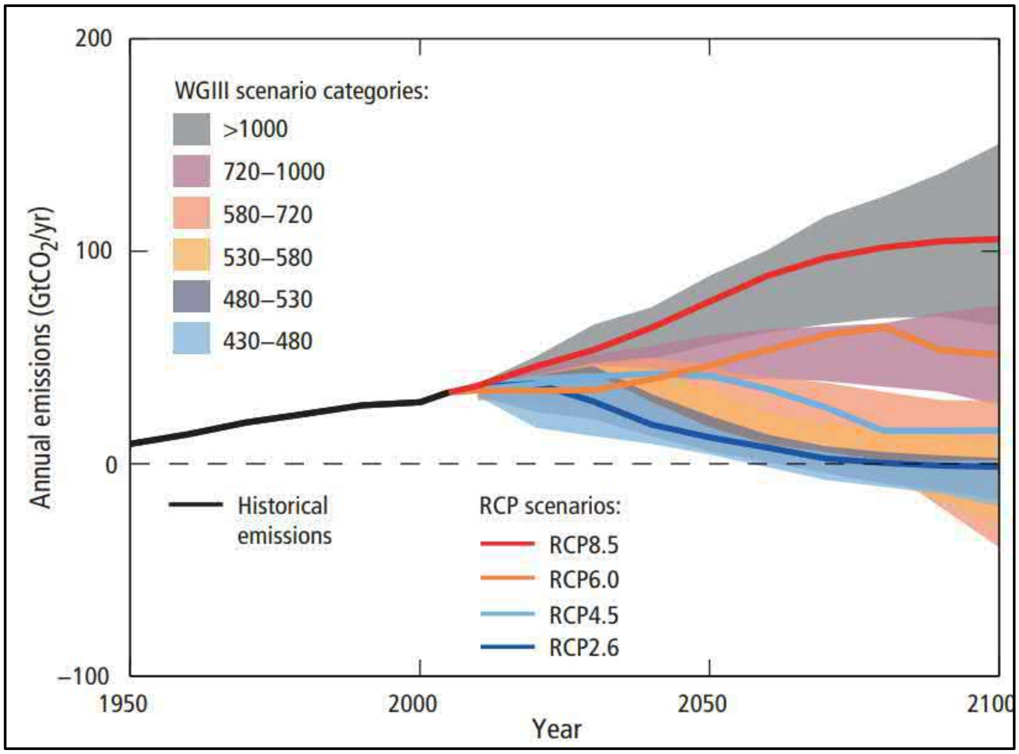


Figure 4-21. Predicted increase in changes to global temperature from CO2 emissions

Source: IPCC Fifth Assessment Report

Note: The emissions of all GHG is represented by the equivalent amount of carbon dioxide (CO_2) in gigatons (Gt). WGIII scenarios are the range of emission scenarios from scientific literature with values listed equivalent amount of carbon dioxide in parts per million.

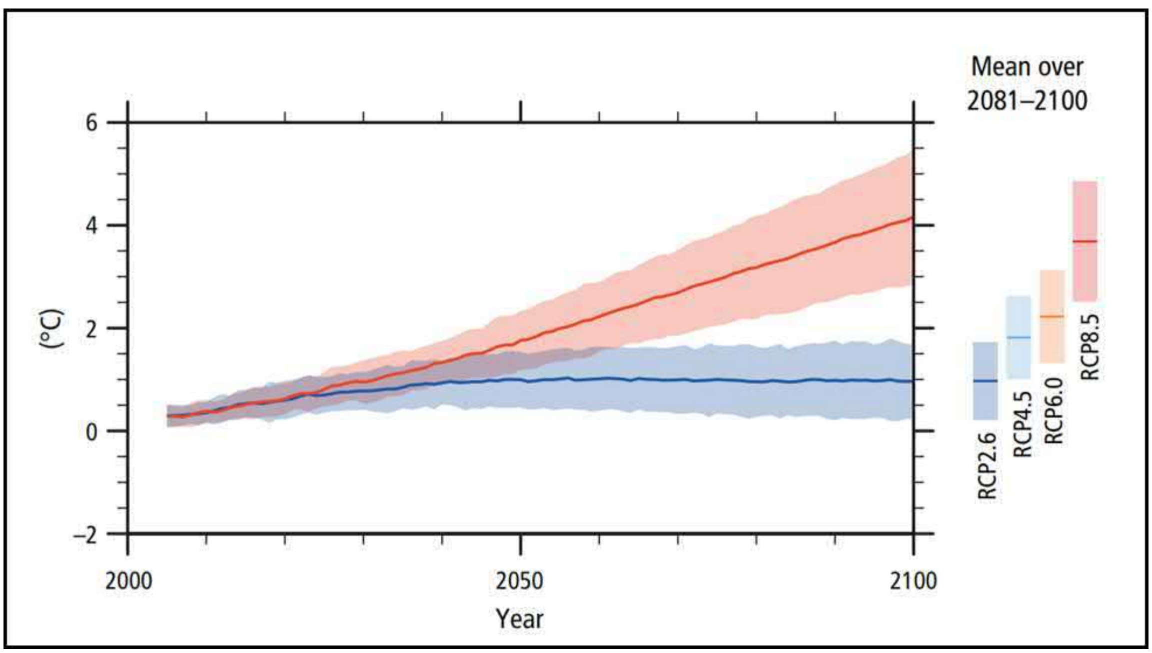


Figure 4-22. Global average surface temperature change relative to 1986-2005.

Source: IPCC Fifth Assessment Report

Table 4-2. Global Mean Sea Level Rise Scenarios (NOAA, 2017).

Scenario	GMSL rise
Low	1.0 ft (0.3 m)
Low-Intermediate	1.6 ft (0.5 m)
Intermediate	3.3 ft (1.0 m)
Intermediate-High	4.9 ft (1.5 m)
High	6.6 ft (2.0 m)
Extreme	8.2 ft (2.5 m)

The *Low* scenario of 1.0 ft (0.3 m) is calculated from measurements of GMSL change of the past 25-years and recent low-end projections of GMSL rise. The *Extreme* scenario for GMSL rise of 8.2 ft (2.5 m) in 2100 represents what is physically plausible, including recent observational and modeling literature related to the potential for rapid ice melt in Greenland and Antarctica (Sweet et al. 2017). The intermediate cases were established by inserting 0.5 m increments between the *Low* and *Extreme* sea level values. The exceedance probability for six GMSL rise scenarios in 2100 using the RCP-based probabilistic projections from Kopp et al. (2014) are shown in Table 4-3.

Table 4-3. Probability of Exceeding GMSL (median value) Scenarios In 2100 Based Upon Kopp et al. (2014).

GMSL rise Scenario	RCP2.6	RCP4.5	RCP8.5
Low (1.0 ft, 0.3 m)	94%	98%	100%
Intermediate-Low (1.6 ft, 0.5 m)	49%	73%	96%
Intermediate (3.3 ft, 1.0 m)	2%	3%	17%
Intermediate-High (4.9 ft, 1.5 m)	0.40%	0.50%	1.30%
High (6.6 ft, 2.0 m)	0.10%	0.10%	0.30%
Extreme (8.2ft, 2.5 m)	0.05%	0.05%	0.10%

The NOAA (Sweet et al. 2017) report cites new evidence that the Antarctic ice sheet may be melting more rapidly than previously expected, which significantly increases the probability of the *Intermediate-High*, *High*, and *Extreme* scenarios, particularly for RCP 8.5 projections based on Kopp et al. (2014). Studies by DeConto and Pollard (2016) found that a change in the rate of glacial ice melt is possible meaning that sea level rise trends may follow the *Intermediate* scenario early in the 21st century but jump up to the *High* or *Extreme* scenario late in the 21st century (Sweet et al. 2017).

4.5.2 *Hawaii Sea Level Rise Predictions*

Hawaii thus far has experienced a rate of sea level rise less than the global average; however, this is expected to change. Hawaii is in the "far field" of the effects of melting land ice so those effects have been significantly less in Hawaii compared to areas nearer to the ice melt. Over the next few decades, those effects will spread to Hawaii, which is then projected to experience sea level rise greater than the global average.

The present rate of global mean sea level change is +3.4 ± 0.4 mm/yr (NOAA, 2017), where a positive number represents a rising sea level. Globally, sea level rise appears to be accelerating compared to the mean of the 20th Century. The sea level trend for Honolulu Harbor for the period of 1905 to present is shown in Figure 4-23 (NOAA, 2020). The rate of sea level change is shown in the figure as being +1.49 ± 0.21 mm/yr based on monthly data for the period of 1905 to 2019. The figure also shows monthly averages of sea level anomalies greater than 0.5 ft (15 cm), which occur on an interannual basis.

The NOAA (2017) sea level rise predictions for the Honolulu Harbor tide station presented in Table 4-4 and Figure 4-24 are based on the revised NOAA projections and include the far field effects. While the projections are based on the most current scientific models and measurements, discretion is necessary in selecting the appropriate scenario. Selecting the appropriate sea level rise projections is a function of many parameters, including but not limited to existing uses and site conditions, presence and type(s) of infrastructure, design life, potential for adaptation, and socioeconomic value.
Since we are currently twenty years into the sea level rise prediction, we are able to compare the modeled sea level rise scenario projections to empirical measurements of sea level (Figure 4-25). The mean trend line from measured sea level is below the current sea level rise predictions; however, the range of the average of monthly measured mean sea level exceeds the range of the sea level rise predictions.

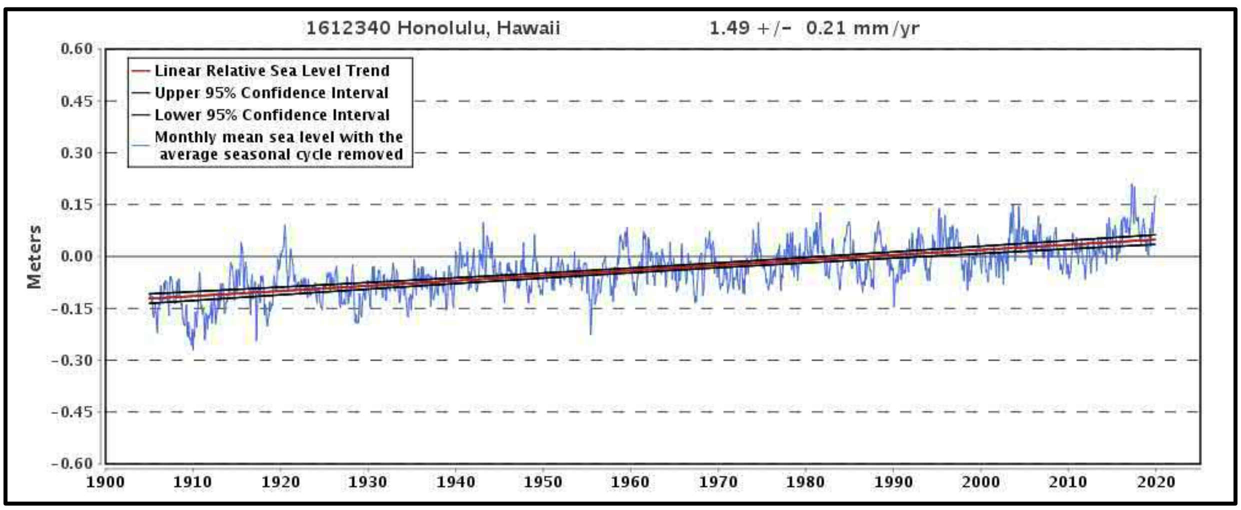


Figure 4-23. Mean sea level trend, Honolulu Harbor, 1905 to present (NOAA, 2020)

Source: https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=1612340

Table 4-4. Hawaii Sea Level Rrise Scenarios (adapted from NOAA, 2017)

Scenario (feet)	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
Low	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.0	1.1	1.2	1.3
Int-Low	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8
Intermediate	0.1	0.3	0.5	0.7	1.0	1.4	1.8	2.3	2.8	3.3	4.0
Int-High	0.1	0.4	0.6	0.9	1.4	2.0	2.6	3.4	4.3	5.2	6.4
High	0.1	0.4	0.7	1.1	1.8	2.5	3.5	4.6	5.9	7.2	8.9

Extreme	0.1	0.4	0.7	1.3	2.0	3.0	4.1	5.5	7.0	8.7	10.9

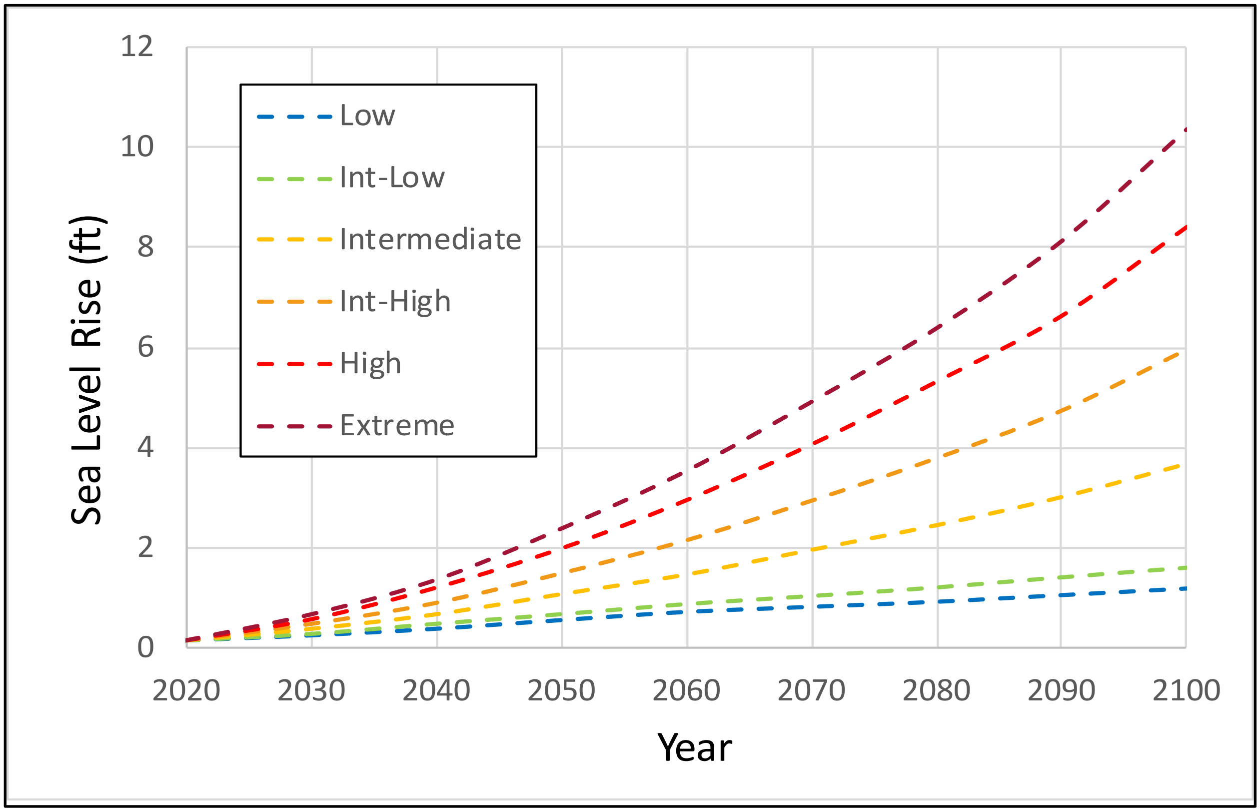


Figure 4-24. Projected sea level rise at Honolulu Harbor tide station (adapted from NOAA, 2017)

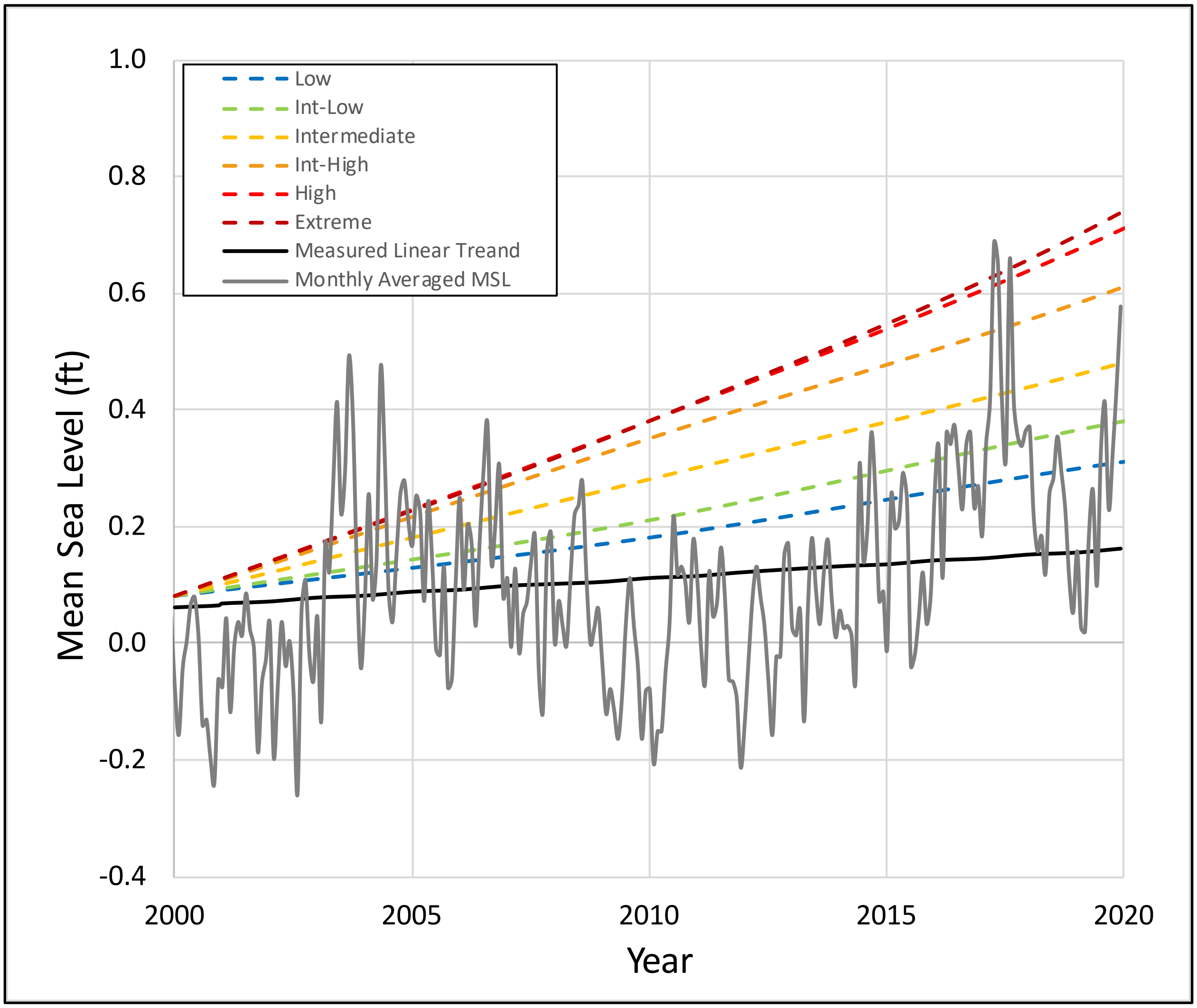


Figure 4-25. Comparison of sea level rise projections to measured mean sea level trends

4.6 Projected Impacts of Sea Level Rise

Sea level rise has the potential to impact beaches and shorelines in Hawaii. Impacts may include beach narrowing and beach loss, loss of land due to erosion, and infrastructure damage due to inundation and flooding. The impacts from anomalous sea level events (e.g., king tides, mesoscale eddies, storm surge) are also likely to increase. A 2015 study found that, due to increasing sea level rise, average shoreline recession (erosion) in Hawaii is expected to be nearly twice the historical extrapolation by 2050, and nearly 2.5 times the historical extrapolation by 2100 (Anderson et al., 2015).

The State of Hawaii recently published the *Sea Level Rise Vulnerability and Adaptation Report for Hawaii*, which discusses the anticipated impacts of projected future sea level rise on coastal hazards, and the potential physical, economic, social, environmental, and cultural impacts of sea level rise in Hawaii. The University of Hawaii conducted numerical modeling to estimate the potential impacts that a 3.2-foot rise in sea level would have on coastal hazards including passive flooding, annual high wave flooding, and coastal erosion. Figure 4-26 shows the inundation that would take place under a one-year return period wave height with 3.2 ft of sea level rise. The results show that the highway would be overtopped and inundated.

Figure 4-26. Annual high wave flooding at Kawailoa Beach under a 3.2 ft sea level rise scenario

4.7 The Statewide Coastal Highway program report

4.7.1 *The CRESI Methodology*

The Statewide Coastal Highway Program Report (SCHPR) is a report authored by University of Hawaii (UH) researchers (primarily from the Department of Civil and Environmental Engineering) for the State of Hawaii Department of Transportation. The report was released in August 2019 (Francis et al, 2019). The report defines an index system, referred to as the Coastal Road Erosion Susceptibility Index (CRESI) to rank coastal roadway systems by their susceptibility to erosion and structural collapse.

The CRESI method evaluates eleven variables to evaluate the roadway erosion hazard potential:

1. Beach geomorphology
2. Coast geomorphology
3. Erodible volume
4. Slope
5. Coastal ground cover and existing structures above ground
6. Road base and subgrade condition
7. Armoring
8. Rate of sea level change
9. Shoreline accretion or erosion rate
10. Mean tide change
11. Significant wave height

Each variable is assigned a susceptibility value from Very Low (1) to Very High (5).

The CRESI variables are statistically weighted and combined to range in value from 0 to 100, although typical values in Hawaii do not exceed 40.

Part of the study results are shown as colorized roadway segments. Yellow segments have low susceptibility to erosion (CRESI values between 0 and 9), blue segments have medium susceptibility values (CRESI values between 10 and 19), and red segments have high susceptibility values (CRESI values equal to or greater than 20).

Specific road sections were also prioritized in order to rank the most critical areas. The twenty most critical segments were ranked and numbered, with others designated as Level 1, Level 2, and Level 3, and Level 4, in decreasing importance. Recommendations for remediation measures were assigned to each ranked segment, including hardening, relocation, elevation, slope protection, beach nourishment and more.

Figure 4-27 shows CRESI values for the North Shore of Oahu. The inset shows the project area at milepost (MP) 3+0.30, with a high susceptibility value of 23. Figure 4-28 is the color-coded susceptibility map. The project reach is colored red, indicating high susceptibility. The project area and the Sunset Beach area were the only sections on the North Shore to be assigned the *High* susceptibility rating.

4.7.2 *Traffic-Prioritized Road Segment Significance*

When roads are damaged by coastal hazards, the resulting losses can be substantial and unduly large. Loss of a single road can disrupt traffic flow patterns over a large area, and block emergency access and material delivery. A roadway priority ranking is therefore an important additive to the CRESI study.

A second part of the UH study constructed a traffic-related priority index involving a range of traffic demand patterns, roadway topological characteristics, and socioeconomic factors. The new parameter was created in a way that it could be added to the CRESI index. The following characteristics were considered:

1. Annual Average Daily Traffic (AADT)
2. Directional peak traffic volume
3. Directional non-peak traffic volume
4. Traffic composition
5. Network redundancy
6. Connectivity
7. Accessibility
8. Capacity
9. Reliability
10. Impacted population groups
11. Trip generation
12. Function and social impact.

The first four variables are elements for traffic demand dynamics. Roadway network topology is represented by variables 5 through 9, and the last three are related to land use.

Data used were a combination of field collected data, existing available data from the Hawaii Department of Transportation, and the use of Google Earth software. Figure 4-29 shows the CRESI susceptibility values for the North Shore updated with the traffic priority index. Changes are minor, but the project area at Laniakea is still rated "high".

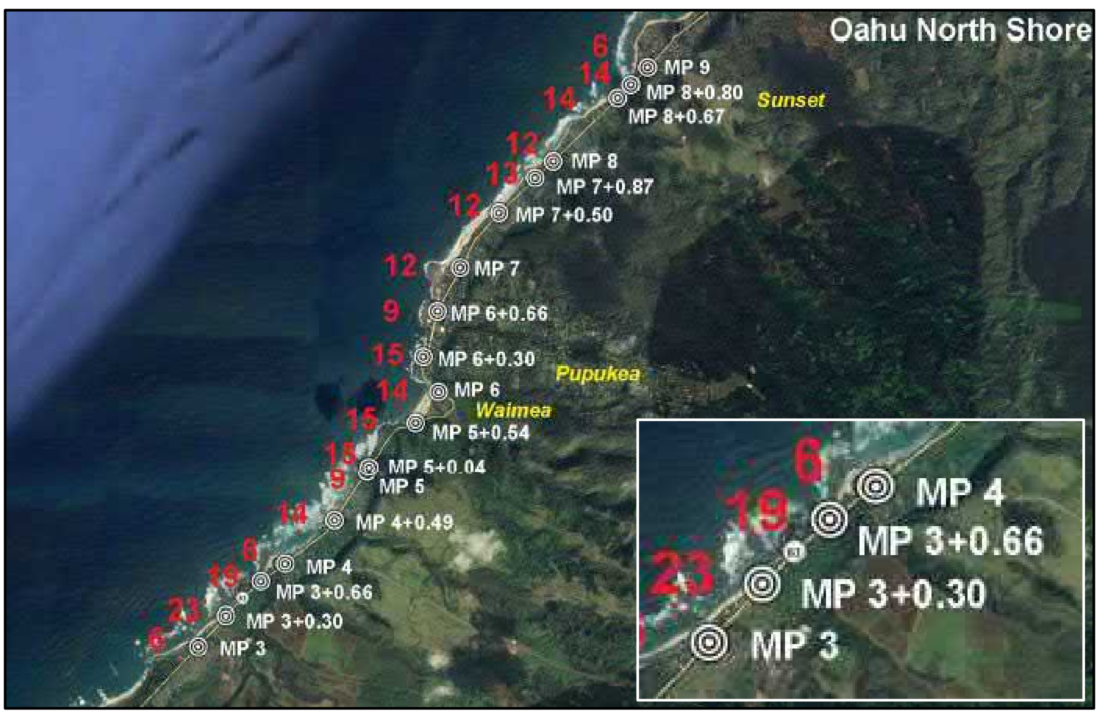


Figure 4-27. CRESI susceptibility values for the North Shore; inset is the project area

Figure 4-28. Road erosion susceptibility; inset is the project area

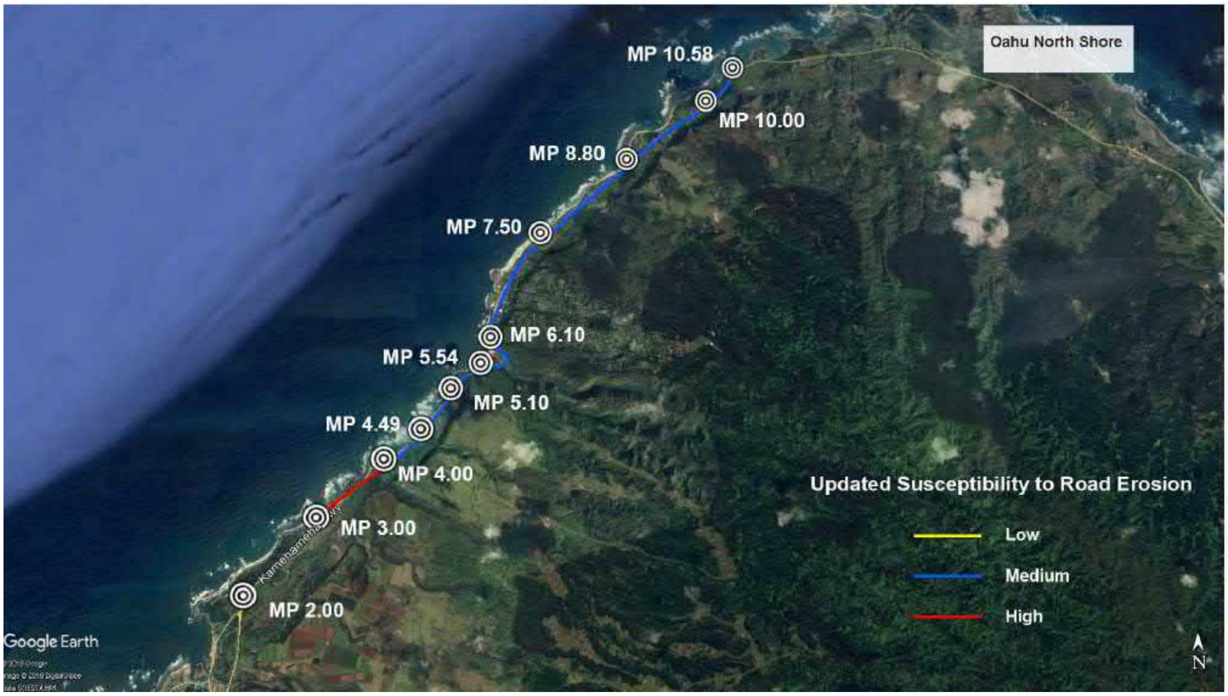


Figure 4-29. North Shore erosion susceptibility updated to include traffic priority index

4.7.3 *Ocean Hazards*

The UH report also includes an Ocean Hazards Database (OHD) and a scheme for classifying ocean hazards termed the Ocean Hazards Classification Scheme (OHCS). Seven OHD variables include:

1. Sea Level Rise (2050, 2100),
2. Tides,
3. Wave period and height,
4. Shoreline change rate and armoring,
5. Tsunami historical and hypothetical depth flows
6. Storm surge,
7. Nearshore benthic habitat zone – major structure, detailed structure, and coverage.

The data are presented for 302 mileposts around the coastlines of all the major Hawaiian Islands and listed in nine summary tables in the report. The variables and sub-variables are shown in Figure 4-30, the Ocean Hazards Data variables and sub-variables (Table 3.1 from Francis et al, 2019).

The classification scheme, including vulnerability rankings is shown in Figure 4-31 (Table 3.2 from Francis et al, 2019) However, only four variables are presently incorporated in the CRESI analysis:

1. Sea level rise (historical rate),
2. Tides,
3. Wave height,
4. Shoreline change.

4.7.4 *Adaptation Recommendations*

The final section in the UH report presents adaptation recommendations for specific highway sections and mileposts. The adaptation options were ranked in terms of a cost benefit analysis that included social, technical, administrative, political, economic, and environmental consideration. Adaptation options include:

Relocate (R): this option is to move away from the water. There are two sub-categories: relocation to an old road (R-O), or relocation to a new road (R_N).

Protect (P): this option is to keep the water out. Options include hard structures (P-H) including seawalls and revetments, or soft approaches including beach nourishment (P-SB) and living dunes (P-SD).

Accommodate (A): this option is the ability to live with the water. Four sub-categories include: vegetative cover / existing green space (GO), wetland construction (WN), and elevated development (E).

Combination (C): this option combines a number of the previous alternatives. These include hard protection with and elevated road (H-E), hard and soft protection (H-SD), and relocate with added green space (R-G). Combination sub-categories include C-H-E, C-H-SD, and C-R-G.

Monitor or no action (M): this option is to leave the road alone and monitor the site periodically.

The results for the project site (milepost 3+0.3) is to monitor the site (Figure 4-32).

Variable	Sub-Variable	Classification	Sub-classification
1	1a	Sea Level Rise	2050 Sea Level Rise Rate[1,2] (1905-2050, extreme scenario) [in/yr]
	1b	Sea Level Rise	2100 Sea Level Rise Rate[1,2] (1905-2100, extreme scenario) [in/yr]
	1c	Sea Level Rise	Historical Sea Level Rise Rate[3,2] (1905-2016) [in/yr]
2	---	Tides	Mean Tidal Range[4] (1983-2001) [ft]
3	3a	Maximum Annually Recurring Waves	Peak Wave Period[5] (2010-2018) [sec]
	3b	Maximum Annually Recurring Waves	Significant Wave Height[5] (2010-2018) [ft]
4	4a	Shoreline Change	Mean Shoreline Change Rate[6] (2008 - 2100) [ft/yr]
	4b	Shoreline Change	CRESI - Armoring Ranking[7] [1 - 5]
5	5a	Tsunami	Historical Flow Depth[8] [ft]
	5b	Tsunami	Hypothetical Flow Depth[8] [ft]
6	6a	Storm Surge	Category 1 Storm Inundation Height[9] (Hypothetical) [ft]
	6b	Storm Surge	Category 2 Storm Inundation Height[9] (Hypothetical) [ft]
	6c	Storm Surge	Category 3 Storm Inundation Height[9] (Hypothetical) [ft]
	6d	Storm Surge	Category 4 Storm Inundation Height[9] (Hypothetical) [ft]
7	7a	Nearshore Benthic Habitat	Zone[10]
	7b	Nearshore Benthic Habitat	Major Structure[10]
	7c	Nearshore Benthic Habitat	Detailed Structure[10]
	7d	Nearshore Benthic Habitat	Coverage[10]

Figure 4-30. Table 3.1 from Francis et al, 2019 showing ocean hazards variables selected from the Ocean Hazards Database

Vunerability Rank	Percent	Variable 1			Variable 2	Variable 3		Variable 4	Variable 5	Variable 6
		Sea Level Rise			Tides	Maximum Annually Recurring Waves		Shoreline Change	Tsunami	Storm Surge
		2050 Sea Level Rise Rate[1,2]* (1905-2050, extreme scenario) **[1a]**	**2100 Sea Level Rise Rate**[1,2] (1905-2100, extreme scenario) **[1b]**	**Historical Sea Level Rise Rate**[3,2] (1905-2016) **[1c]**	**Mean Tidal Range**[4] (1983-2001) **[2]**	**Peak Wave Period**[5] (2010-2018) **[3a]**	**Significant Wave Height**[5]* (2010-2018) **[3b]**	**Mean Shoreline Change Rate**[6]* (2008-2100) **[4a]**	**Tsunami Flow Depth**[7]* (Historical and Hypothetical) **[5]**	**Weighted Mean Storm Surge Inundation Height**[8]* (Hypothetical) **[6]**
1	**0-20%**	< 0.1 in/yr	< 0.2 in/yr	< 0.02 in/yr	< 2.0 ft	< 4 sec	< 7 ft	< 0 ft/yr	No inundation or Hypothetical inundation < 16 ft with no Historical Inundation	No Inundation or Category 4 Inundation < 4 ft
2	**21-40%**	0.1 to 0.2 in/yr	0.2 to 0.4 in/yr	0.02 to 0.04 in/yr	2.0 to 2.1 ft	4 to 7 sec	7 to 14 ft	0 to 2 ft/yr & "N/A" with > 3 Armoring Ranking	Hypothetical inundation ≥ 16 ft with no Historical Inundation	Category 3 Inundation < 4 ft or Category 4 Inundation of 4 to 8 ft
3	**41-60%**	0.2 to 0.3 in/yr	0.4 to 0.7 in/yr	0.04 to 0.06 in/yr	2.1 to 2.2ft	7 to 11 sec	14 to 21 ft	2 to 5 ft/yr & "N/A" with ≤ 3 Armoring Ranking	Historical inundation < 6 ft	Category 3 Inundation of 4 to 7 ft or Category 2 Inundation < 1 ft
4	**61-80%**	0.3 to 0.4 in/yr	0.7 to 0.9 in/yr	0.06 to 0.08 in/yr	2.2 to 2.3 ft	11 to 14 sec	21 to 29 ft	5 to 7 ft/yr	Historical inundation of 6 to 12 ft	Category 2 Inundation of 1 to 6 ft or Category 1 Inundation < 1 ft
5	**81% or greater**	≥ 0.4 in/yr	≥ 0.9 in/yr	≥ 0.08 in/yr	≥ 2.3 ft	≥ 14 sec	≥ 29 ft	> 7 ft/yr	Historical inundation ≥ 12 ft	Category 1 Inundation of 1 to 4 ft

Figure 4-31. Table 3.2 from Francis et al (2019) showing Ocean Hazards Classification Scheme rankings for selected variables

Figure 4-32. Adaptation recommendation for the project site is to Monitor (M)

5. COASTAL HAZARD REVIEW AND MITIGATION

5.1 Coastal Process Review

As noted in Section 3.3.2, the North Shore has a bimodal wave climate consisting primarily of long period North Pacific swell from the northwest in the winter, and short period trade wind waves from the north and northeast that occur year-round.

The North Shore beaches are unusually dynamic because of the wave climate and the large volume of sand available. Erosion estimates are difficult and prone to error (see Section 2.5). However, recent transient sea level rise events and anomalous wave climate seasons have shown that the existing conditions are fragile and subject to change.

The giant waves from one prevailing direction (northwest) that occur during the winter months have constructed a large sand storm berm, 20 to 25 ft in elevation, that forms the landward edge of the beach backshore for much of the entire North Shore. It is an unusual and defining morphological feature. During winter conditions there may be many cycles of beach transformation whereby a low elevation active berm and beach profile are formed during smaller wave conditions and then transition to a beach storm profile as wave conditions increase in magnitude (see Figure 2-20).

With the end of the energetic winter wave season, the trade wind waves from the north tend to push the lower active beach to the south. This sand migration transforms many of the North Shore beaches over the course of the summer. Sand will tend to collect at natural headland formations such as Rocky Point, Kulalua Point and the southern end of embayments such as Kawailoa Beach. Prolonged longshore transport to the south can result in degradation and collapse of the storm berm morphology during the transition period of late summer and early fall (Figure 5-1).

Figure 5-1. Storm berm collapse at Ke Nui Road, October 2013

5.2 Coastal Hazard Review

The major coastal hazards likely to affect the Laniakea Highway realignment project area can be divided into two main areas, shoreline erosion and coastal flooding. Shoreline erosion is an increasingly chronic condition for many Hawaii coastlines. Signs of erosion at the project site are detailed in Section 2.6. Figure 4-21 in Section 4.5.2 shows that the entire project reach is vulnerable to wave overtopping and coastal flooding with a projected 3.2 ft sea level rise scenario. Section 4.4 details the likely inundation effects of a 100-year tsunami.

5.2.1 *Shoreline Erosion Mitigation Options*

Although shoreline erosion is difficult to quantify on the North Shore because of the inherently dynamic beaches, recent erosion episodes and indicators, including preventive measures on Kawiloa Beach, have shown the vulnerability that exists. With additional erosional pressures likely due to climate change and sea level rise, it is prudent to consider the area at risk. If project stakeholder goals are to protect the area from erosion, mitigation and protection options are outlined below. There are three reaches defined for the project area (see Section 2.6), Turtle Beach, the revetment reach, and the storm berm reach.

Turtle Beach

Situated in the lee of Pu'u Nenue, Turtle Beach is relatively well protected. The back shore is well vegetated and the stacked rock wall does not show strong evidence of wave attack. The foreshore consists of a broad expanse of reef rock (see Figure 2-11) which is highly resistant to erosion and offers good natural protection by helping to dissipate wave energy.

Although Turtle Beach has good natural protection, wave energy and erosional pressure are expected to increase with rising sea level, and damage to the stacked wall and backshore are possible. Replacement of the stacked rock wall with a modern rock revetment engineered to account for sea level rise would prevent future erosion and damage to the backshore. A seawall could also be used for protection on this reach if a reduced footprint is required.

Revetment Reach

The revetment reach is probably the most exposed and vulnerable area within the project shoreline area. The revetment is necessary to prevent shoreline erosion at present, and the need will only grow with time and impending climate change. The existing structure is damaged and will become increasingly vulnerable to wave attack, exposing the backshore to erosion and damage.

Replacement of the existing, damaged rock rubble mound structure with modern rock revetment engineered to account for sea level rise would prevent continued erosion and damage to the backshore. The design should be updated to modern standards and design wave heights that accommodate predicted sea level changes. The revetment should ideally extend past the existing reach and terminate at the north bridge abutment. It is also recommended that it be extended across the Turtle Beach reach (see Figure 5-2).

Storm Berm Reach

The storm berm reach extends from the south bridge abutment to the end of Kawailoa Beach (out of the project area). While the morphology provides robust natural erosion protection, there are seasonal risks as discussed in Section 2.1 and Section 2.6.3 and Section 5.1. Most of the storm berm reach is buffered by private homes and properties that are 100 to 200 ft in lot depth. The most at-risk area is the approximately 50-ft reach adjacent to and just south of the south bridge abutment (Figure 5-2). This area has a lower berm elevation than further reaches, and the distance to the road is less, providing a shorter erosion buffer. The properties close to this area have temporary shore protection in the form of geotextile fabric draped over the storm berm and filled with sand at the base. Some of the protection consists of stacked sand-filled geotubes formed in place by the fabric.

Sand pushing is recommended as the primary mitigation effort for erosion protection of the storm berms. Stream clearing of built up sand can also serve as a sand source to build up the abutment area. Geotextile drapes can be used for emergency protection. The soils immediately behind the abutment can also be protected using scour protection methods such as HDPE (Tensar) rock mattresses. Hardening of storm berm shorelines with a seawall or revetment is not recommended because it can interfere with the adaptability of the berm and will change the inherent shoreline morphology.

Figure 5-2. Recommended 875-ft reach for new revetment; location of south abutment area

5.2.2 *Coastal Flooding Recommendations*

Flooding of the project upland area can occur from wave overtopping, hydrologic events (rainfall), or from tsunami. Flood protection involves thoughtful design, drainage, and scour protection. Drainage design is an essential part of flood control of all types to ensure that 1) flooding does not pond in place or, 2) drainage velocities are restricted or the drainage conduits are well protected from scour. Both wave overtopping and tsunami inundation can produce high water velocities. Irregular topography can produce pockets of scour. Protruding structures such as walls or posts are at risk of both causing scour and being damage or undermined from flowing water.

Scour protection can help prevent erosion of the substrate, especially in vulnerable areas such as embankments, or high flow areas such as drainage channels. In critical areas stone rip rap or rock-filled HDPE mattresses can be designed to prevent scour. In less critical areas scrub vegetation can be effective.

5.2.3 *Mitigation Options*

<u>Hard Shore Protection: Revetments and Seawalls</u>

Seawalls and revetments have been used with mixed success in the storm berm morphology on the North Shore. Due to the berm elevation and wave climate, hard structures will tend to be massive unless the bottom substrate is relatively shallow. The hard structures interfere with the berm building process and change the character of the beach. They are generally not recommended, with some exceptions such as the exposed revetment reach of this project.

Seawall

A seawall is a vertical or sloping concrete, cement-rubble-masonry (CRM), or cement-masonry-unit (CMU) wall used to protect the land from wave damage and erosion (Figure 5-3). A seawall, if properly designed and constructed, is a proven, long lasting, and relatively low maintenance shore protection method. Seawalls also have the advantage of having a relatively small "footprint" on the shore.

The impervious and vertical face of a seawall results in very little wave energy dissipation. Hence, wave energy is deflected both upward and downward, and a large amount of wave energy is reflected seaward. Reflected wave energy can inhibit accretion of sand in front of the wall, and thus seawalls should be used with some caution and a full understanding of local conditions.

The downward energy component can cause scour at the base of the wall, and thus the foundation of a seawall is critical for its stability. Ideally, a seawall should be constructed on solid, non-erodible substrate. Seawalls are not flexible structures, and their structural stability is dependent on the stability of their foundations.

If the foundation of the seawall is breached, hydraulic action can erode fill material behind the wall. With the loss of enough fill, the ground surface behind the seawall will collapse into a *sink hole*. When a sink hole is observed, repairs should be made as soon as possible or the wall will eventually fail. Repairs are usually done by excavating behind the wall, reinforcing the foundation with concrete, and replacing the fill with appropriately graded material.

A seawall is not recommended for protection against shoreline protection in the project area, except for the Turtle Beach reach, where either a seawall or revetment could replace the existing stacked rock wall.

Figure 5-3. CRM seawall in Kahala

Rock Rubblemound Revetment

A revetment is a sloping uncemented structure built of wave resistant material. The most common method of revetment construction is to place an armor layer of stone, sized according to the design wave height, over an underlayer and filter designed to distribute the weight of the armor layer and to prevent loss of fine shoreline material through voids in the revetment.

Toe scour protection can be provided by excavating to place the toe on solid substrate where possible, constructing the foundation as much as practical below the maximum depth of anticipated scour, or extending the toe to provide a scour apron of excess stone.

Properly designed and constructed rock revetments are durable, flexible, and highly resistant to wave damage. Should toe scour occur, the structure can settle and readjust without major failure. Damage from large waves is typically not catastrophic, and the revetment can still function effectively even if damage occurs. A revetment currently protects the existing roadway in the project area. Damage to the revetment, already evident in places, can be expected to increase with rising sea level. Replacement of the existing revetment with a new revetment structure designed to account for sea level rise will provide assured protection and resiliency for the backshore infrastructure.

Figure 5-4 shows a typical design section for a rock rubblemound revetment. The toe configuration assume that the nearshore and foreshore beach rock outcrops extend to the back shore area (see Figure 2-23). A detailed design analysis will be necessary for armor stone size calculation, but it will likely be on the order of 2 to 4 tons. The existing stone is approximately 4,300 lbs (see Section 2.6.2).

Figure 5-2 shows the suggested extent of the new revetment. The reach extends from Turtle Beach to the north bridge abutment and is approximately 875 ft in length. One of the difficulties in revetment design is proper start and end configurations. Extending into existing structures such as the bridge abutment is a design convenience that reduces potentially more problematical end arrangements.

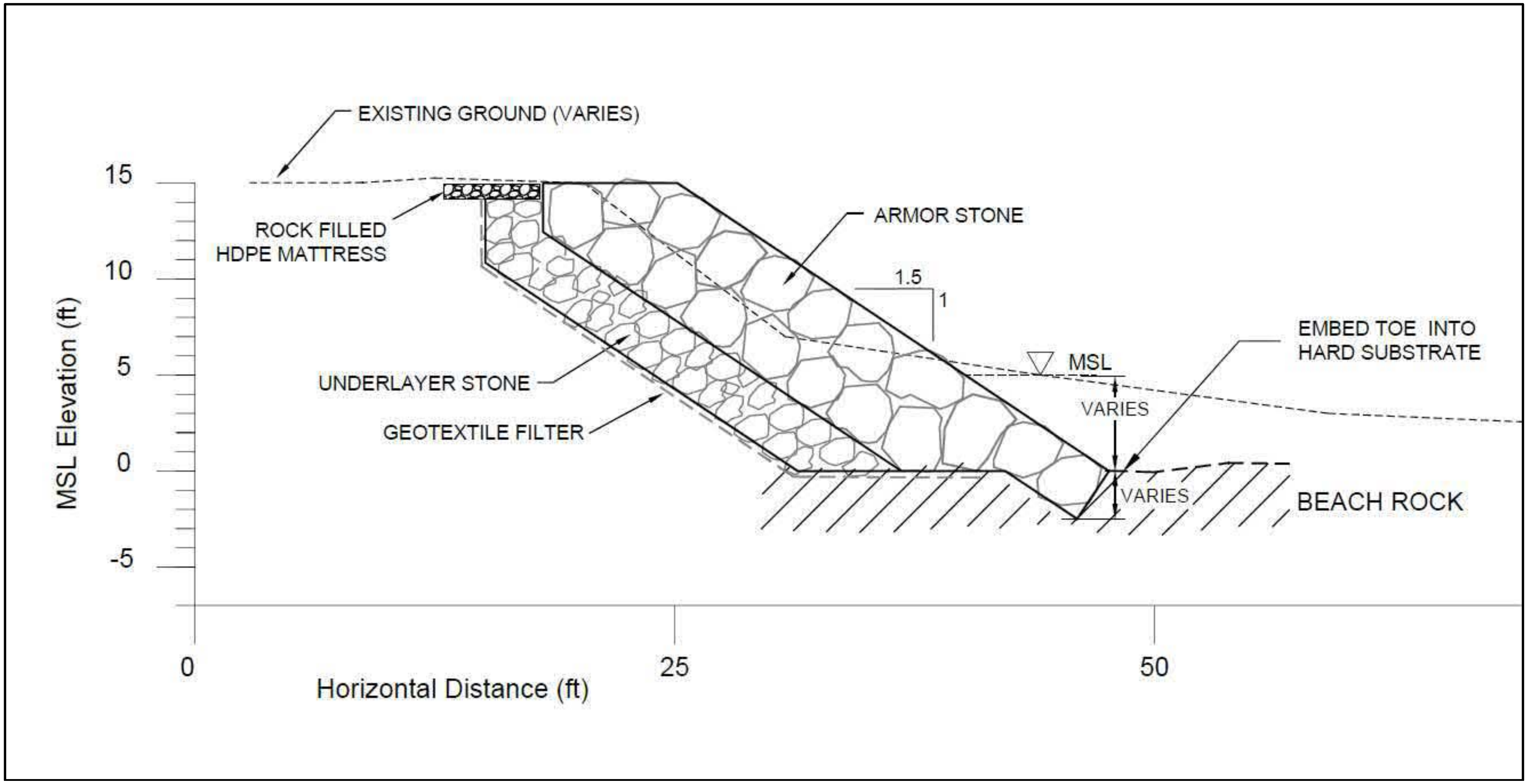


Figure 5-4. Typical revetment section

Soft Shore Protection: Beach Maintenance and Temporary Protection

Soft Shore Protection includes the options of beach nourishment, berm stabilization (sand pushing), and shoreline retreat. Beach nourishment is not a viable option for most North Shore Beaches because the extreme wave climate and substantial seasonal sand movement render it infeasible to bring in enough additional material to make a difference. Although it can be viewed as a form of beach nourishment, berm stabilization is really a beach maintenance option using existing sand, including sand cleared from stream mouths. It has proven effective on the North Shore. The project itself is a form of managed retreat from the shoreline, i.e. it moves threatened infrastructure away from the vulnerable shoreline.

Beach Maintenance - Sand Pushing

Sand pushing is a maintenance effort that has been used successfully to restore the storm berm at many North Shore erosion hot spots such as Sunset Beach, Rocky Point, and Ehukai Beach (Figure 5-5). It is preventive maintenance best accomplished when there is maximum accretion on the low active beach. The spring transitions months of April through June are probably the opportune time for sand pushing on the North Shore. The transition months of September through November are typically the time where the storm berm can be most eroded, and the low beach absent for those areas most affected by trade wind sand migration. The maintenance effort should therefore occur approximately 6 months before the season of active erosion.

Sand should ideally be pushed as high as possible on the berm to mimic the natural process of berm building during high wave conditions. A robust berm system has a better chance of surviving adverse seasonal or anomalous conditions to provide shore protection during the winter high wave season.

Temporary Berm Protection

The use of geotextile draped over the storm berm has proven successful as a temporary emergency measure to help prevent destruction of the storm berm during erosional conditions (see Figure 2-21 and Figure 2-22). The geotextile is difficult to anchor in place and is not sustainable for longer than one or two years.

Stream Clearing

Sand will naturally build up in front of stream mouths, forming a temporary dam and creating an estuary or muliwai. Natural clearing occurs when the water level behind the dam overtops and erodes the sand. Clearing as a maintenance effort occurs to prevent flooding of upland areas. Cleared sand from Lauhulu Stream is a natural source for berm restoration and a valuable source for out of season sand.

Figure 5-5. Sand pushing on the North Shore (DLNR photo)

Scour Protection

Scour protection involves the use of natural or engineered materials to resist the scour induced by wave action or flooding. Light scour can be mitigated with the use of ground cover. Heavy scour from wave inundation or heavy flooding from hydrologic events or tsunami can be prevented using rip rap sized to the design conditions, or encased rock mattresses. High Density Polyurethane (HDPE), or polymeric rock mattresses are relatively recent innovation that uses HDPE webbing to encase cobble-sized rock material.

Rip Rap

Rock Rip rap structures are similar to rock rubblemound structures but are generally used for smaller wave environments or riverbank protection. Rip rap uses a wide gradation of stone size, versus the limited range used for a rubblemound structure. While not recommended for shore protection in the project setting, rip rap stone could be used in some applications for scour protection.

Rock Filled HDPE Mattress

Triton Marine Mattresses are fabricated by the Tensar Corp. and consist of rock-filled HDPE (high density polyethylene) geogrid. The typical width is 5 ft and the recommended maximum length is 35 ft. However, the length can vary and design length is dependent on the desired handling characteristics of the mattress. A 12-inch by 35-ft mattress weighs about 9 tons. Figure 5-6 is a photograph of the Triton mattresses used as an articulating revetment. Rock-filled mattresses can be effective scour protection. They have the advantage that they can be covered with sand or fill and vegetated, enabling them to be hidden from view or used as part of landscaping (Figure 5-7).

Figure 5-6. Rock-filled HDPE mattresses used for articulating protection

Figure 5-7. Rock-filled HDPE mattresses with fill and vegetation

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Appendix

E

Terrestrial Vegetation and Wildlife Survey

Report of Findings

Terrestrial Vegetation and Wildlife Survey

Kamehameha Highway Pedestrian Safety Project, Hale`iwa, O`ahu, Hawaii

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April 2021

Table of Contents

Tables

Appendices

INTRODUCTION

This report includes the findings of a plant and animal inventory conducted at the proposed alternative alignment for the Kamehameha Highway Pedestrian Safety Project on the Island of O`ahu, Hawaii. The HDOT is proposing to improve Kamehameha Highway in the vicinity of Laniākea Beach. While funding when the project started in 2011 was specifically intended to address shoreline erosion, the focus has now shifted to improve pedestrian safety. The proposed project will also address coastal erosion to improve roadway reliability; relieve congestion to reduce travel times through the area; and provide safe facilities and access for vehicles, pedestrians, and cyclists. This report addresses regulatory issues under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, species for Hawaii Revised Statutes (HRS) Chapter 195D, and documentation for HRS Chapter 343.

The primary objectives of the field studies were to inventory the plants and animals located within the project area and vicinity of the proposed alignment (Study Area), provide a general description of the vegetation within the Study Area, and search for threatened and endangered species as well as species of concern. The federal and State of Hawaii listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998, 2014; U. S. Fish & Wildlife Service (USFWS) 2021).

SITE DESCRIPTION

The Study Area includes the proposed highway realignment transect (Figure 1) of Kamehameha Highway in the vicinity of Laniākea Beach on the North Shore of O`ahu as well as adjacent lands, including the coastal strand. The project area is dominated by disturbed pastureland, the existing highway, and parking areas.

The climate in the Study Area is characterized as moderately dry and sunny. According to the Online Rainfall Atlas of Hawaiʻi (Giambelluca et al. 2013), the area receives a mean annual rainfall of approximately 36 inches (932 millimeters [mm]). Rainfall is typically highest in January and lowest in June-July (Giambelluca et al. 2013). The topography of the Study Area is relatively flat with Lauhulu Stream bisecting near the western section with elevations ranging between about 28 feet (8.5 m) above mean sea level (amsl) at the mauka extent to about 6 feet (2 m) above amsl at the makai extent of the Study Area. Principal soil types include Waialua Silty Clay [WkA], Waialua Stony Silty Clay [WIB], Jaucus sand [JaC], and Beaches [BS]. (NRCS, 2019). Photographs of the project area are found in Appendix A.

METHODS OF STUDY

This study was conducted by LeGrande Biological Surveys Inc. flora and fauna specialists. Prior to conducting fieldwork, the biologists reviewed existing scientific literature, a previous biological survey report of the area (LBS, 2014), topographic maps and images, and engineering drawings relevant to the proposed project. Field data was collected on October 7, 2019, August 25, 2020, and March 26, 2021.

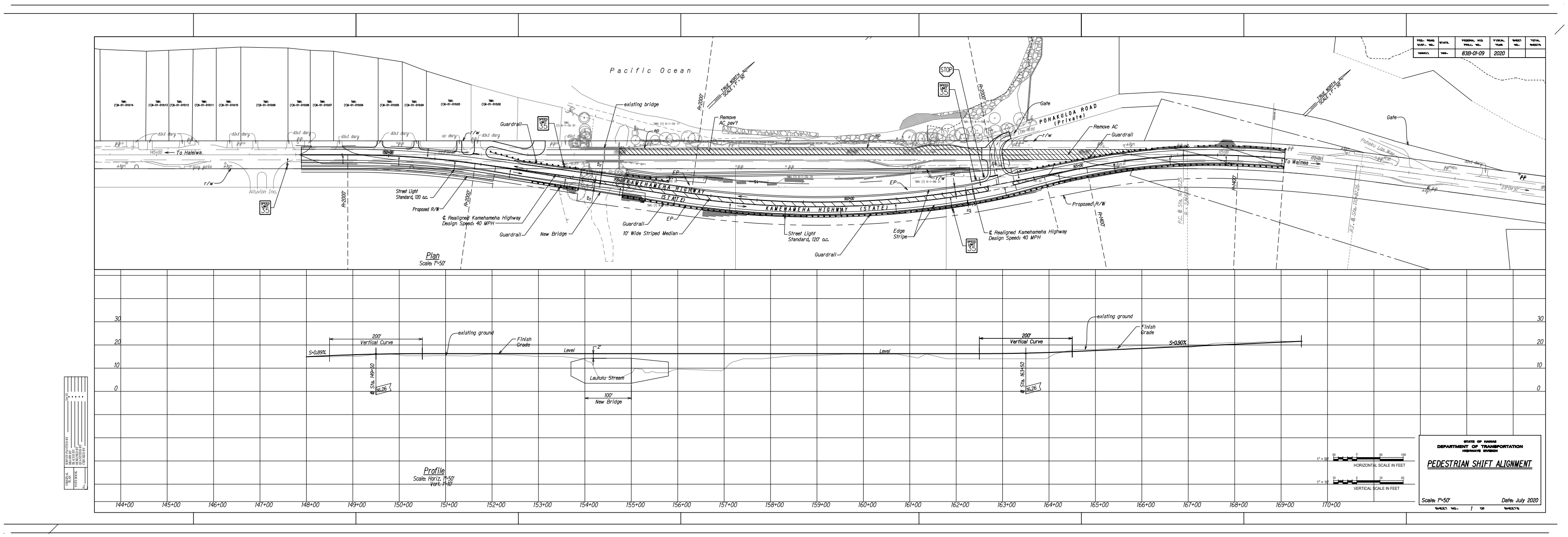

Figure 1. Plan and Profile for the Proposed Pedestrian Shift showing study area.

Plants and animals were inventoried during a pedestrian survey along the proposed alternative alignment as well as the proposed area of impact. The area of impact included the coastline at the high tide line and inland, extending up to 50 feet past the proposed new road alignment (Figure 1). Both the Hale`iwa or west end and the Waimea or east end of the new alignment were surveyed at least 250 feet in all directions from where the alignments depart the present roadway. Notes were collected on plant associations and plant distribution, disturbances, topography, substrate types, exposure, drainage, and related factors. Ornamental plants that are planted or used for landscaping were not included in the species list but included in the discussion.

Faunal surveys involved walking the Study Area and noting all bird species observed. Birds were identified by sight using the naked eye and 7x42 binoculars, and by songs and calls. For native bird species, the actual number of individuals observed is reported, for alien species only a list of species is provided. Special attention was given to the intermittent stream that crosses the project area in order to search for possible wetland habitats that could harbor endangered native waterbirds, including the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Coot (*Fulica alai*), Hawaiian Gallinule (*Gallinula galeata sandvicensis*), and the Hawaiian Stilt (*Himantopus mexicanus knudseni*). Observations of mammals, amphibians, reptiles, and insects were made incidental to the collection of avian point-counts and related surveys of vegetation. Visual observations of animals, animal vocalizations, tracks, and scat were tallied. No effort was made to develop quantitative estimates of mammal populations within the Study Area.

SURVEY RESULTS

Vegetation

A total of 77 plant species were observed within the Study Area. These species are listed in Appendix B. 73 of the 77 species observed, or over 95%, are alien to Hawaii and 5 are native (all indigenous). We found none of the plant species listed as a threatened species, endangered species, or a species of concern (U.S. Fish and Wildlife Service, 2015) within the Study Area.

The coastline within the Study Area is either dominated by residential houses and yards, planted with ornamental landscaping, or comprised of sandy substrate that is dominated by coastal strand species such as naupaka (*Scaevola taccada*), milo (*Thespesia populnea*), ironwood (*Casuarina oppositifolia*), coconut (*Cocos nucifera*), pohuehue (*Ipomoea pes-caprae*), and kipukai (*Heliotropium curassavicum*).

The land at the western end of the alignment is utilized for ungulate (horse) pasture, dominated by grassy areas for foraging with sections of bare dirt. Tree species scattered in or around the edges of the pasture include Christmas berry (*Schinus terebinthifolius*), Chinese banyan (*Ficus macrocarpa*), ironwood, kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), and autograph trees (*Clusia rosea*). Grass species include Bermuda grass (*Cynodon dactylon*), Guinea grass (*Panicum maximum*), kikuyu (*Pennisetum clandestinum*), buffelgrass (*Cenchrus ciliaris*) and swollen fingergrass (*Chloris barbata*).

The intermittent stream, Lauhulu (also known as Laniākea and Kukaiohiki), transects the Survey Area at the western end of Laniākea Beach. The existing bridge that spans the stream is located near the coastline, thus the substrate under the bridge, and for approximately 40 feet mauka (inland), is sand. Very little vegetation was observed in this area. Some vines of pohuehue were observed growing in the dry steam bed and milo trees are growing on both sides of the bridge near the roadway. Koa haole, Guinea grass, lion's ear (*Leonotis nepetifolia*), beggar tick (*Bidens alba*), and Chinese violet (*Asystasia gangetica*) were observed in the upper (inland) areas. The slope area close to the current highway is dominated by weedy pasture species such as kiawe, cocklebur (*Xanthium strumarium* var. *canadense*), sourbush (*Pluchea carolinensis*), and false ragweed (*Parthenium hysterophorus*). The bridge overpass near the beach is mainly bare sand with scattered species such as pohuehue, naupaka, and milo. Milo trees are prevalent at the coastal section. No wetland plant species (Obligate Wetland Species) were observed in the general area of the stream channel or surrounding areas.

The majority of the Study Area on the mauka (inland) side of the road is dominated by an overgrown forest of invasive tree species with weedy understory or open pastureland. The species are consistent throughout this vegetation type with the dominant tree species including, koa haole, autograph tree, kiawe, Chinese banyan, and Christmas berry. Understory plants include, Guinea grass, mock orange (*Murraya paniculata*), bougainvillea (*Boerhavia coccinea*), and khaki weed (*Alternanthera pungens*).

Wildlife

A total of 9 bird species were observed on the proposed project site during the site visits, of which 8 were alien (non-native) and one is indigenous (Table 1). The indigenous bird species observed is a migratory shorebird, the Pacific Golden Plover or kolea, which nests in Alaska and spend the winter months in the Hawaiian Islands and elsewhere. One Pacific Golden Plover was observed in the pasture at the western end of the project area.

No endangered waterbirds were observed, and no wetland habitat was found that would be suitable for waterbirds. The Lauhulu drainage channel was dry and showed no evidence of recent flow during the 2019 and 2020 site visits. During the March 2021 survey, Lauhulu Stream had standing water due to several major precipitation events that preceded in February and March. No waterbirds were observed utilizing the Lauhulu Stream area.

The endemic Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) is listed as endangered by the State of Hawaii on the Island of Oʻahu. Pueo occupy a variety of habitats and are most common in open habitats including grasslands and shrublands, often in urban areas. It is a ground nesting species, and thus sensitive to land clearing activities. Its key habitat requirements are difficult to determine due to a lack of historical population data. Pueo were not observed and is not known to occur in the area, but it is possible that it could occasionally use the grassy habitat in the area for foraging or nesting.

Table 1. Birds observed within the Survey Area during site visits on October 7, 2019 & August 25, 2020

The following list is an inventory of the bird species observed at the Survey Area. It is possible that additional introduced bird species are present in the area and might be seen with greater survey effort. The names are arranged in generally accepted phylogenetic order and named in accordance with the American Ornithologists Union Checklist (2005).
Status codes:
X=Alien species introduced to the Hawaiian Islands by humans, intentionally or accidentally.
I=Indigenous species native to the Hawaiian Islands and also found elsewhere in the world.

SCIENTIFIC NAME	COMMON NAME	STATUS
ARDEIDAE-HERONS		
Bubulcus ibis	Cattle Egret	X
PLUVIALIDAE-PLOVERS		
Pluvialis fulva	Pacific Golden Plover	I
COLUMBIDAE – PIGEONS AND DOVES		
Geopelia striata	Zebra dove	X
ZOSTEROPIDAE – WHITE-EYES		
Zosterops japonicas	Japanese white eye	X
STURNIDAE – MYNAS AND STARLINGS		
Acridotheres tristis	Common Myna	X
RINGILLIDAE – FINCHES		
Carpodacus mexicanus	House Finch	X
Paroaria coronate	Red-crested Cardinal	X
ESTRILDIDAE – WAXBILLS AND MANNIKINS		
Padda oryzivora	Java Sparrow	X
Lonchura atricapilla	Chestnut Mannikin	X

Indian mongooses (*Herpestes a. auropunctatus*) were observed within the Study Area. Feral cats (*Felis catus*) were seen and cat tracks were observed in several areas near the bypass alignment. Although not observed, Norway rats (*Rattus norvegicus*), Polynesian rats (*Rattus exulans hawaiiensis*), Roof rats (*Rattus r. rattus*), and European house mice (*Mus domesticus*) most likely also inhabit the project area. These introduced predators are known to have detrimental impacts upon populations of native wildlife, and also serve as a means of passive transport for propagules of invasive and noxious plants.

Wetlands

The National Wetland Inventory (NWI) (2020) has mapped wetlands within the Lauhulu Stream vicinity of the proposed realignment (Figure 2). The stream channel itself is intermittent and appears to have water flow or fill only during heavy rain events. Additionally, an area to the west of the stream is mapped as an estuarine and marine wetland by the NWI, but no evidence of standing water or wetland plant species were observed to the west of the intermittent stream during the site surveys on October 7, 2019 or August 25, 2020. A wetland reconnaissance site visit was conducted with a group from WSP USA, Army Corps of Engineers, and the author on March 26, 2021 to investigate the mapped estuarine wetland. Site data (Appendix C) from the investigation summarized the area as a non wetland.

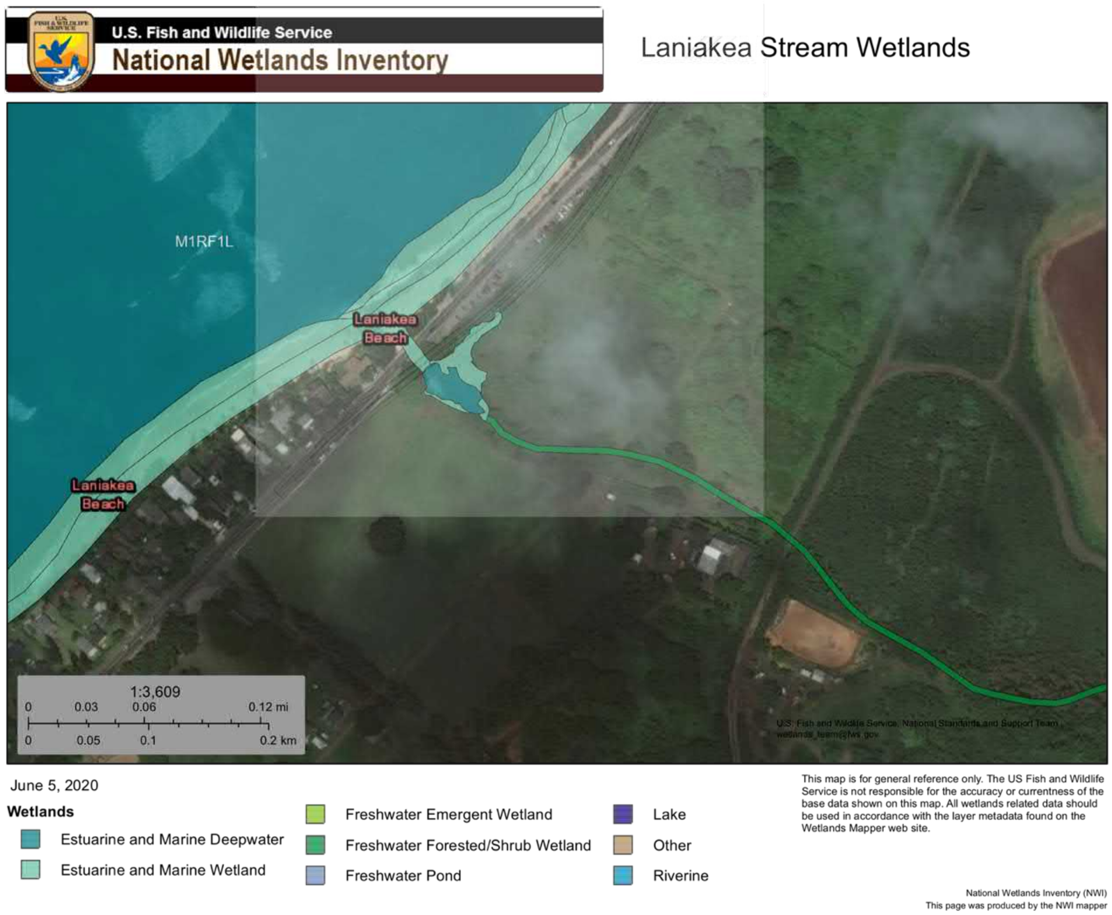

Figure 2. National Wetland Inventory Map showing mapped Estuarine and Marine Wetland and Estuarine Marine Deepwater in and around Lauhulu Stream.

DISCUSSION & RECOMMENDATIONS

The results of the fieldwork represent a snapshot of the wildlife and plants inhabiting the Survey Area. As such, these data cannot be considered a definitive list of all species that utilize habitats. Many species are diminutive and cryptic in nature making observation difficult. Other species are nocturnal and/or may use the area infrequently depending upon season, weather, interaction with other species, and dynamic changes in their populations. However, when considered together with the results of historical surveys, we can compile a reasonably accurate description of the environment and biota of the project area.

Plant and wildlife habitats within the Survey Area have been highly modified by human activities, including the intentional and accidental introduction of alien species. The vast majority of the plant and bird species observed within the Survey Area are introduced.

Critical Habitat

There is no federally delineated Critical Habitat for any plant, avian, or mammalian species on, or close to the proposed Survey Area. Thus, modifications of habitat on the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under state law.

Potential Impacts to Protected Species

None of the plant or bird species observed at the Survey Area are listed as endangered or threatened. The Pacific Golden Plover are protected by the Migratory Bird Treaty Act, but they do not nest in Hawaii and are adaptable in their habitat use during the winter months, foraging and resting in a variety of open habitats, including pastures, grassy fields, lawns, beaches, and shorelines.

Even though pueo were not observed during the site surveys, it is recommended that a pre-construction nest survey be conducted to confirm there are no pueo nesting in the area prior to any vegetation clearance. All construction and on-site staff should be trained to identify pueo and possible nests present in the project area (any area that construction activities modify the vegetation and/or landscape). If a pueo nest is observed, a 50-foot buffer should be established and marked clearly so that it is not disturbed by construction. The appropriate DOFAW representative should be notified of location and minimization measures taken.

It is possible that the endangered Hawaiian Petrel (*Pterodroma sandwichesis*) and the threatened Newell's Shearwater (*Puffinus auricularis newelli*) over-fly the project area between April and the middle of December each year in very small numbers. Newell's Shearwaters are not known to breed on the Island of O`ahu, though recent acoustical surveys conducted on the island have recorded low numbers of this species calling over the higher reaches of the island (Young, et al., 2019). There is no suitable nesting or roosting habitat for any of these seabird species within the Study Area. Although the Study Area does not provide suitable habitat for listed Hawaiian seabirds, they may fly over the general area at night and may be attracted to construction lighting. In order to minimize potential impacts to seabirds it is recommended that construction activities be limited to daylight hours during peak fallout period (September 15-December 15) or shielded lighting be in place for night time work.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*), which is listed as endangered by the U.S. Fish and Wildlife Service and the State of Hawaii, is known to occur nearby and could forage or roost in the project area. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, females carrying their pups may be less able to rapidly vacate a roost site while vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, and very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 1 and September 15, the pupping season. It is recommended that these guidelines are followed post-construction as well. If additional fencing is included in the construction phase it is recommended that any type of barbed wire or razor wire not be used.

Green Sea Turtles or honu (*Chelonia mydas*) were observed in the waters off Laniākea Beach during the survey adjacent to the Survey Area. Green Sea Turtle nesting mostly occurs in the Northwestern Hawaiian Islands. It is also possible that the Hawaiian Monk Seal (*Monachus schauinslandi*) may occur in the area. Any construction activities that may be in close proximity to the coastal strand should be monitored to ensure that neither of these two marine species are disturbed.

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APPENDIX A – SITE PHOTOGRAPHS

Figure 1. Near entrance to Alluvion Farms at western end of project area looking east. Open pastureland characterizes the proposed alignment to the bridge crossing at Lauhulu Stream.

Figure 2. Existing bridge at Lauhulu Stream. Milo trees and Guinea grass dominate the vegetation at the sloping banks of the stream.

Figure 3. Vegetation within the sandy dry streambed of Lauhulu includes pohuehue, Guinea grass, and castor bean.

Figure 4. Lauhulu intermittent Stream bisects the bridge and leads directly to the shore at Laniakea Beach.

Figure 5. Looking mauka near the middle point of the survey transect. Pastureland mauka of the new alignment and the survey area is dominated by weedy vegetation; koa haole and Guinea grass thickets.

Figure 6. At the junction of Kamehameha Highway and Pohaku Loa Way, a proposed turnaround may alter the existing vegetation of naupaka, milo, sea grape, and ironwood.

Figure 7. Existing highway is in close proximity to the coastline that is sparsely vegetated with pohuehue vines, invasive grasses, and trees such as milo, kiawe, and tree heliotrope.

APPENDIX B: PLANT SPECIES LIST

The following checklist is an inventory of all the plant species observed within the Survey Area for the proposed new Kamehameha Highway alignment at Laniākea Beach. The plant names are arranged alphabetically by family and then by species into each of two groups: Monocots and Dicots. The taxonomy and nomenclature of the 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 are those recorded in the Hawaii Biological Survey series (Evenhuis and Eldredge, eds., 1999-2002). 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:

   I= indigenous= native to the Hawaiian Islands and elsewhere.
   X=introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's arrival in the islands in 1778

SCIENTIFIC NAME	COMMON NAME	STATUS
MONOCOTS		
ALOEACEAE		
Aloe vera (L.) N.L.Burm.	aloe	X
ARECACEAE		
Areca catechu L.	betel nut palm	X
Cocos nucifera L.	coconut	X
Phoenix dactylifera	date palm	X
CYPERACEAE		
Cyperus rotundus L.	kili oʻopu	X
PLANTAGINACEAE		
Plantago major L.	common plantain	X
POACEAE		
Brachiaria mutica (Forssk.) Stapf	California grass	X
Cenchrus ciliaris L.	buffelgrass	X
Cenchrus echinatus L.	common sandbur	X
Chloris barbata (L.) Sw.	swollen fingergrass	X
Cynodon dactylon (L.) Pers	manienie, Bermuda	X
Digitaria insularis (L.) Mez ex Ekman	sourgrass	X
Eleusine indica (L.) Gaertn.	wiregrass	X
Eragrostis tenella (L.) P.Beauv. Ex Roem.&Schult.		X
Melinus repens (Willd.) Zizka	natal redtop	X
Panicum maximum L.	Guinea grass	X
Pennisetum clandestinum	kikuyu	*X*

DICOTS

ACANTHACEAE		
Asystasia gangetica (L.) T. Anderson	Chinese violet	X
AIZOACEAE		
Tetragonia tetragonioides (Pall.) Kuntze	New Zealand spinach	X
AMARANTHACEAE		
Alternanthera pungens Kunth	khaki weed	X
Amaranthus spinosus L.	spiny amaranth	X
Amaranthus viridis L.	slender amaranth	X
ANACARDIACEAE		
Schinus terebinthifolius Raddi	Christmas berry	X
ASTERACEAE		
Bidens alba (L.) DC. var. *radiata* Ballard ex Melchert	beggar tick	X
Calyptocarpus vialis Less.	straggler daisy	X
Eclipta alba L.	false daisy	X
Parthenium hysterophorus L.	false ragweed	X
Pluchea carolinensis (Jacq.) G. Don	sourbush	X
Tridax procumbens (L.)	coat buttons	X
Verbesina encelioides (Cav.) Benth. & Hook	golden crown-beard	X
Xanthium strumarium var. *canadense* Mill.	cocklebur	X
BORAGINACEAE		
Heliotropium curassavicum L.	kipukai	I
Heliotropium foertherianum L.	tree heliotrope	X
Heliotropium procumbens Mill. var. *depressum*		X
BRASSICACEAE		
Lepidium virginicum L.	pepperwort	X
CASUARINACEAE		
Casuarina equisetifolia L.	ironwood	X
CHENOPODIACEAE		
Atriplex semibaccata R.Br.	Australian saltbush	X
CLUSIACEAE		
Clusia rosea Jacq.	autograph tree	X
COMMELINACEAE		
Commelina benghalensis L.	hairy honohono	X
CONVOLVULACEAE		
Ipomoea obscura (L.) Ker Gawl.		X
Ipomoea pes-caprae subsp. *brasiliensis* (L.)	pohuehue	I
Ipomoea triloba L.	little bell	X
CUCURBITACEAE		
Coccinea grandis (L.) Voigt	ivy gourd	X

EUPHORBIACEAE		
Chamaesyce hirta (L.) Millsp.	hairy spurge	X
Chamaesyce hypercifolia (L.) Millsp.	graceful spurge	X
Ricinus communis L.	castor bean	X
FABACEAE		
Acacia farnesiana (L.) Willd.	klu, aroma, kolu	X
Chamaecrista nictitans (L.) Moench	partridge pea	X
Crotalaria incana L.	fuzzy rattlepod	X
Crotalaria pallida Aiton	smooth rattlepod	X
Desmanthus pernambucanus (L.) Thell.	slender or virgate mimosa	X
Desmodium tortuosum (Sw.) DC	Florida beggarweed	X
Indigofera hendecaphylla Jacq.	creeping indigo	X
Indigofera suffritocosa Mill.	iniko	X
Leucaena leucocephala (Lam.) de Wit	koa haole	X
Macroptilium lathyroides (L.) Urb.	wild bean	X
Pithecellobium dulce (Roxb.) Benth.	opiuma	X
Prosopis pallida (Humb. & Bonpl. Ex Willd.) Kunth	kiawe, algaroba	X
GOODENACEAE		
Scaevola taccada (Gaertn.) Roxb.	naupaka	I
LAMIACEAE		
Leonotis nepetifolia (L.) R.Br.	lion's ear	X
MALVACEAE		
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	X
Malva parviflora L.	cheese weed	X
Thespesia populnea (L.) Sol. Ex Correa	milo	X
MORACEAE		
Ficus microcarpa L.f.	Chinese banyan	X
NYCTAGINACEAE		
Boerhavia coccinea Mill.		X
Bougainvillea sp. A.L. Jussieu	bougainvillea	X
OXALIDACEAE		
Oxalis corniculata L.	yellow wood sorrel	X
POLYGONACEAE		
Coccoloba uvifera (L.) L.	sea grape	X
PORTULACACEAE		
Portulaca oleracea L.	pigweed	X
RUTACEAE		
Murraya paniculata (L.) Jack	mock orange	X
SOLANACEAE		
Nicotiana glauca Graham	tree tobacco	X
Physalis angulata L.	husk tomato	X
Solanum americanum Mill.	glossy nightshade, popolo	I

Solanum lycopersicum L. var. *cerasiforme* (Dunal) Spooner, G.J. Anderson & R.K. Jansen	cherry tomato	X
Solanum seaforthianum Andrews		X
STERCULIACEAE		
Waltheria indica L.	uhaloa	I
VERBENACEAE		
Duranta erecta L.	golden dewdrop	X
Stachytarpheta jamaicensis (L.) Vahl	Jamaican vervain	X

APPENDIX C: WETLAND DATA

Field Investigation March 26, 2021

A mapped National Wetland Inventory (NWI) Estuarine and Marine Wetland previously noted as a non-wetland by M. LeGrande was visited for further investigation.

Two test pits were dug within a representative area within the proposed NWI mapped wetland. Vegetation notes and a sketch of vegetation zones for the area are described below. Common name and scientific name are provided for dominant plants as well as percent cover and wetland rating (US Army Corps of Engineers, 2018. National Wetland Plant List)

There were 4 zones divided from NW to SE (or Makai to Mauka)

Zone 1 (closest to the shoreline and Highway is dominated by bare muddy substrate with large tress up to 45 feet in height.

Kiawe (*Prosopis pallida*) 40% FACU

Milo (*Thespesia populnea*) 30% FAC

Christmas Berry (*Schinus terebinthifolius*) 20% FACU

Zone 2 (transition zone between shaded forest to pasture. Large percentage of bare muddy substrate with scattered grass and shrub species. Test Pit 2 (TP2) is located in this zone)

Bermuda grass (*Cynodon dactylon*) 90% FACU

Golden crown-beard (*Verbesina encelioides*) 7% FACU

Apple of Peru (*Nicandra physalodes*) 2% N/A

Spiny Amaranth (*Amaranthus spinosus*) less than 2% FACU

Swollen fingergrass (*Chloris barbata*) less than 3% FACU

Straggler daisy (*Calyptocarpus vialis*) less than 3% FAC

Zone 3 (Mini Micro High-narrow zone with monotypic dominant vegetation)

Spiny Amaranth (*Amaranthus spinosus*) 95% FACU

Zone 4 (Open pasture area with mixed vegetation and minimal bare ground. Test Pit 1 (TP1) is located in this zone.)

Bermuda grass (*Cynodon dactylon*) 75% FACU

Straggler daisy (*Calyptocarpus vialis*) 50% FAC

False ragweed (*Parthenium hysterophorus*) 5% UPL

Figure 1. Vegetation at Zones 1 and 2. Location of Test Pit 2

Figure 2. Vegetation at Zones 3 and 4. Location of Test Pit 1

Figure 3. Test pit 1

Figure 4. Test Pit 2

Prosopis pallida – Kiawe 40% FACU
Thespesia populnea – milo 30% FAC
Schinus terebinthifolios –
Christmas Berry – 20% FACU

Bermuda grass 90% FACU
Golden crownbeard 7% FACU
Apple of Peru 2% —

TP2

Amaranth >2% FACU
Swollen Finger grass >3 FACU
Straggler Daisy >3 FAC

"Mini Micro High"

Amaranth 95% FACU

Bermuda grass 75% FACU
Straggler Daisy 50% FAC
Parthenium 5 UPL

TP1

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Kamehameha Highway Pedestrian Shift City: Haleiwa Sampling Date: 3/26/2021 Time: 10:00

Applicant/Owner: HDOT State/Terr.: HI Island: Oahu Sampling Point: Test Pit #2 in Zone 1

Investigator(s): Malie McCullen, Jan Reichelderfer, Dexter Eji, Maya LeGrande TMK/Parcel: 61005023

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21.617256 Long: -158.086259 Datum: ____ Slope (%): 1-3%

Soil Map Unit Name: Wailua Series NWI classification: estuarine and marine wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No x (If no, explain in Remarks.)

Are Vegetation yes, Soil yes, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No x

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** x
Hydric Soil Present?	Yes ____	No x		
Wetland Hydrology Present?	Yes ____	No x		

Remarks:

Animals browsing and resting under the trees.

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. Bermuda Grass (Cynodon dactylon)	90%		
2. Golden Crown-beard (Verbesina encelioides)	7%		
3. Apple of Peru (Nicandra physalodes)	2%		
4. Spiny Amaranth (Amaranthus spinosus)	2%		
5. Swollen fingergrass (Chloris barbata)	3%		
6. Straggler daisy (Calyptocarpus vialis)	3%		
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** x

Remarks:

Weather conditions have been rainier than usual over the preceding weeks.

SOIL

Sampling Point: Test Pit 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2.5	7.5YR3/3							
2.5-12	7.5YR3/4							
12-21	7.5YR3/4							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Muck Presence (A8)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Dark Surface (S7)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

__ Stratified Layers (A5)
__ Sandy Mucky Mineral (S1)
__ Red Parent Material (TF2)
__ Very Shallow Dark Surface (TF12)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ____
Depth (inches): ____

Hydric Soil Present? Yes ____ No X

Remarks:

Zone 1 is closest to the highway and consists of large trees. Zone 2 is further mauka in the area partially shaded by tall trees. Soil is covered with animal waste as this is where the cattle and horses go to be in the shade. Test pit #2 was dug in this transition between shaded forest to pasture. Large percentage of bare muddy substrate with scattered grass and shrub species.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Aquatic Fauna (B13)
__ Tilapia Nests (B17)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres on Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Fiddler Crab Burrow x C10) (Guam, CNMI, and American Samoa)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

x Surface Soil Cracks (B6)
__ Sparsely Vegetated Concave Surface (B8)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Salt Deposits (C5)
__ Stunted or Stressed Plants (D1)
__ Geomorphic Position (D2)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Kamehameha Highway Pedestrian Shift City: Haleiwa Sampling Date: 3/26/2021 Time: 10:00

Applicant/Owner: HDOT State/Terr.: HI Island: Oahu Sampling Point: Test Pit #1 in Zone 2

Investigator(s): Malie McCullen, Jan Reichelderfer, Dexter Eji, Maya LeGrande TMK/Parcel: 61005023

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21.617158 Long: -158.086272 Datum: ______ Slope (%): 1-3%

Soil Map Unit Name: Wailua Series NWI classification: estuarine and marine wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation yes, Soil yes, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. Bermuda grass (Cynodon dactylon)	75%		
2. Straggler daisy (Calyptocarpus vialis)	50%		
3. False Ragweed (Parthenium hysterophorus)	5%		
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

Weather conditions have been rainier than usual over the preceding weeks.

SOIL

Sampling Point: Test Pit 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	reddish							could not dig further, hit rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No X

Remarks:

This zone was referred to as Zone 4. Test pit #1 was dug here.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrow X (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): ____________

Water Table Present? Yes _____ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix

F

Lauhulu Stream Hydraulic Analysis

Kamehameha Highway Pedestrian Safety Project

Vicinity of Laniakea Beach, Honolulu County, Hawaii

Lauhulu Stream Hydraulic Analysis

Purpose

A hydraulic analysis was conducted to support a "No-Rise" self-certification in the Lauhulu stream for the realignment of the Kamehameha Highway. The Pedestrian Shift alignment alternative includes a new bridge over the Lauhulu stream while maintaining the existing roadway vertical profile. The project location is shown in Figure 1.

Figure 1 - Project Location

Background

Lauhulu stream (also known as Laniakea stream or Kukaiohiki Gulch) is an intermittent stream that flows northwest through the project area to its confluence at Laniakea Beach. At the bridge overpass location, the stream channel is sandy. The upper reaches of the stream are steep which contributes to rapid flow during heavy rain.

The Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) include coastal AE and VE flood zone designations for the entire north coast of Oahu Island. However, the FEMA FIS and FIRM do not include individual riverine studies or water surface flood elevation profiles for the Lauhulu stream which is designated Zone X. The nearest streams that are studied in detail by FEMA are the nearby Waimea River and Anahulu River for which base flood elevations, and Zone AE and regulatory floodway boundaries, are published. The FEMA flood zone designations near the project site are shown on Figure 2.

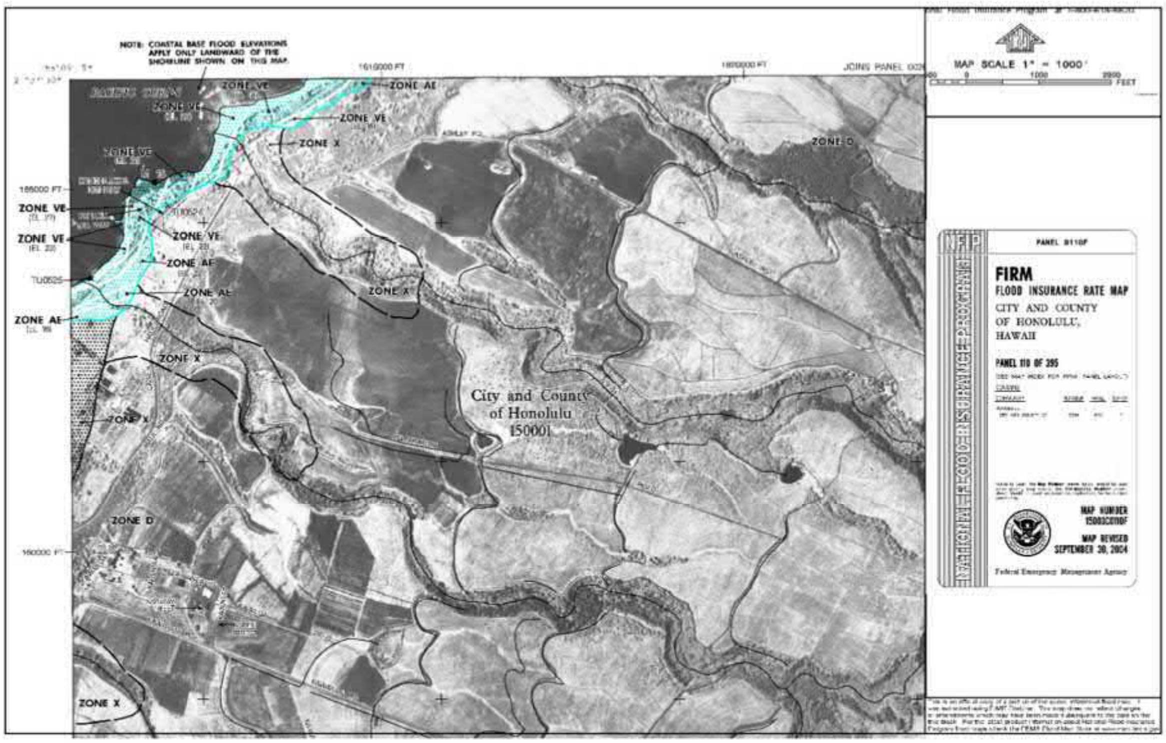


Figure 2 – FEMA Flood Zones

Zone X floodplains are not Special Flood Hazard Area (SFHA) and are not regulated by FEMA under the National Flood Insurance Program (NFIP). However, state and local regulatory agencies may require a "No-rise" certification for the proposed alternatives. The "No-rise" certification requires a riverine hydraulic analysis to compare water surface elevation profiles of existing and proposed conditions. The "No-rise" certification is focused on the impact of the proposed alternatives on the flood elevations caused by riverine flooding and is a separate consideration from the coastal flood hazards.

Study Approach

Open channel hydraulic models of existing and proposed conditions must be developed to calculate and compare the respective water surface elevation profiles of the design riverine flood in the absence of coastal flooding. The hydraulic models are typically developed for the 1% annual chance flood (also referred to as the 100-year flood) using the US Army Corps of Engineers HEC-RAS computer program in steady-state 1D mode. For each stream, the study reach extends from the mouth of the stream several hundred feet upstream of the proposed bridge.

Lauhulu stream is not in a designated riverine SFHA, therefore, a hydraulic model meeting FEMA's standard for approximate studies is sufficient for "no-rise" certification unless disallowed by the regulatory review agency. As in a detailed model, an approximate model provides a comparison between existing and proposed conditions to support a "no-rise" certification. However, approximate models use generalized watershed information and ground elevation data without the benefit of site-specific hydrology or ground surveys. The results of the approximate model is appropriate for planning purposes and it should not be used for site design or for establishing base flood elevations for construction of new structures.

Data Sources

Elevation Data

The geometry of existing stream cross-sections in the study reach was derived from 2013 1-meter Digital Terrain Model (DTM) of Oahu, downloaded from the State of Hawaii GIS Program website. For use in this project, the DTM was re-projected to State Plane Coordinates and elevations converted to feet.

Hydrology

The design discharge is the 1% annual chance flood flow. The United States Geologic Survey (USGS) StreamStats online tool was used to delineate the drainage area, estimate hydrologic parameters of the watershed, and calculate the design discharge from regression equations. The StreamStats report is included in Exhibit 1.

Existing Bridge Data

The geometry of the existing bridge over the Lauhulu stream was obtained from plans shown in Exhibit 2. The existing bridge is 64 feet long and has a center pier. For this project, this bridge will remain in place for pedestrian and cyclist use.

Land Cover

Land cover information was obtained from recent aerial orthophotography to estimate Manning's roughness coefficients in the hydraulic model.

Proposed Design

The proposed bridge is a 100-ft clear span concrete slab with vertical abutments and wingwalls located just upstream of the existing 65-foot bridge. The bridge is at an approximately ten-degree skew with the existing bridge. The average distance between the two bridges is 20 feet although this may change slightly during final design.

The proposed bridge is designed to meet no-rise conditions. It is sized to have greater flow conveyance capacity than both the existing bridge downstream and the existing stream channel at the new alignment. The proposed bridge location and proposed design sketches are shown in Exhibit 3.

Hydraulic Model

A HEC-RAS hydraulic model of the Lauhulu stream was developed for this project based on the 1% annual chance discharge. The model is designed to compare the 1% annual chance water surface elevations under existing and proposed conditions. Manning's n values were based on aerial photography and V.T. Chow's Open Channel Hydraulics Manning's n for Channels - Mountain Streams.

The stream channel includes steep banks, trees and brush along the banks submerged at higher flood stages. Manning's n value of 0.045 was used for the main channel whereas n value of 0.07 is applied to the overbanks accounting for medium brush in the floodplain.

Downstream boundary conditions were calculated using normal depth. The downstream channel slope obtained from the 2013 1-meter DTM of Oahu is used as the energy slope. Existing and proposed bridges were modeled using the bridge routine in HEC-RAS. For the 1% annual chance design discharge, the road is overtopped by the 100-year flood for both existing and proposed conditions, and bridge flow is represented in the model using the Pressure and Weir bridge modeling approach.

Study Results

HEC-RAS output tables and plots are included in Exhibit 4. A comparison of 1% water surface elevations (WSEs) for existing and proposed conditions upstream of the proposed bridge is shown in Table 1. It indicates that the proposed Pedestrian Shift realignment of Kamehameha Highway at Lauhulu stream would not result in a surcharge to the bridge headwater.

HEC-RAS Cross-section upstream of proposed bridge	Pedestrian Shift Realignment Alternative	Existing 1% Annual Chance WSE (ft NAVD88)	Proposed 1% Annual Chance WSE (ft NAVD88)
RS 435	Bridge Headwater	17.61	17.58

Table 1 - Comparison of 1% water surface elevations

During final design, the calculations should be refined to reflect the site topographic survey and construction plans. Any potential minor surcharges may be mitigated using one or more of the following:

- Modifying the wingwall design to streamline flow between the existing and proposed bridges and reduce flow contraction and expansion losses.
- Excavating the sand deposits downstream of the existing bridge to maintain conveyance. A maintenance plan may be required to ensure sand is cleared after storm surges.
- Excavating the channel at the bridge and downstream of it to increase the flow area and conveyance.
- Paving the channel under the bridge to reduce Manning's n value and increase conveyance.

Conclusion

The proposed bridge is sized to have greater flow conveyance capacity than the existing bridge. The hydraulic analysis indicates that the proposed bridge is not expected to result in an increase in the 1% annual chance flood elevations of Lauhulu stream.

Exhibit 1 – StreamStats reports
Exhibit 2 – Plans of existing bridge
Exhibit 3 – Proposed bridge
Exhibit 4 – Pedestrian Shift - Lauhulu Stream - HEC-RAS Output table and plots

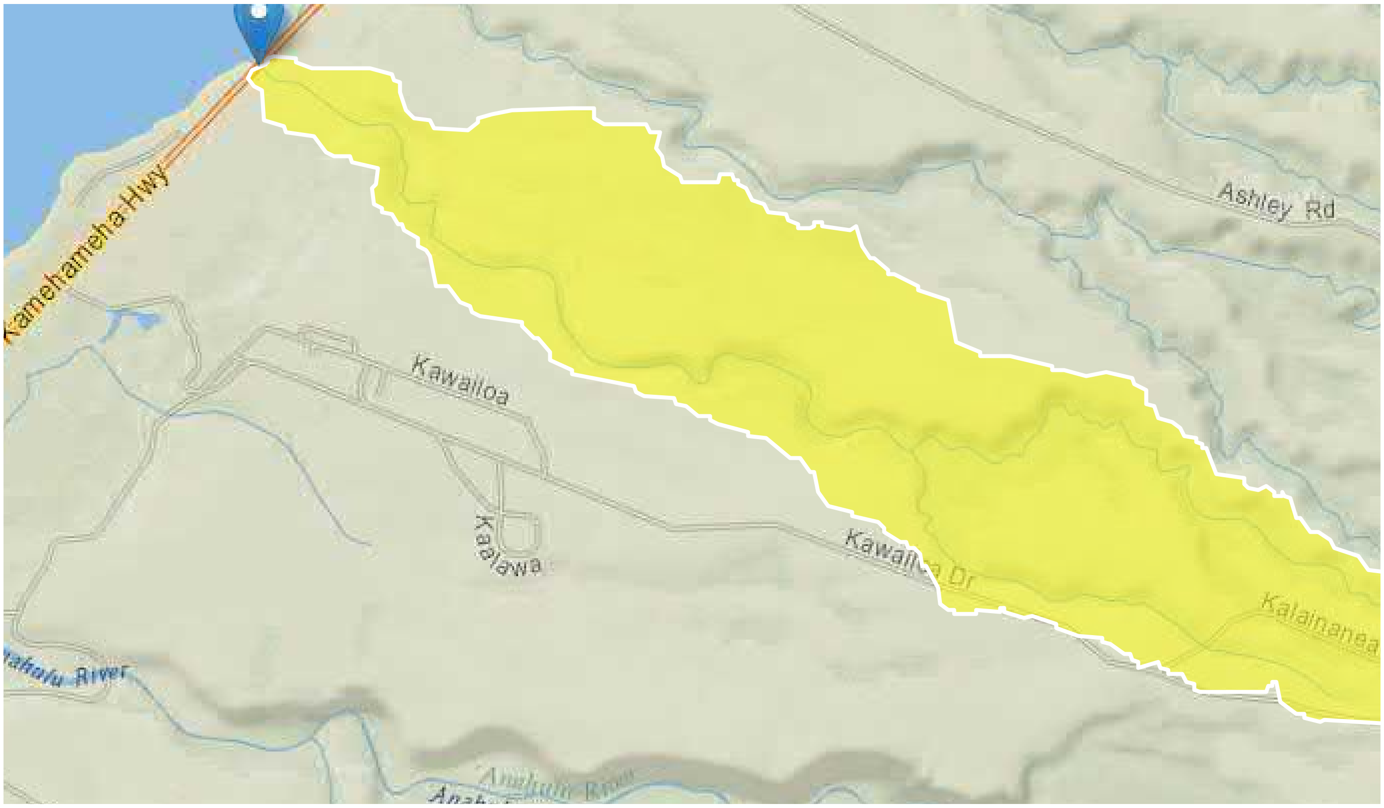
Suite 1270S
115 West Washington Street
Indianapolis, IN 46204

Tel.: +1 317 972-1706
Fax: +1 317 972-1708
wsp.com

Exhibit 1: StreamStats Reports

StreamStats Report

Region ID: HI
Workspace ID: HI20200202235430080000
Clicked Point (Latitude, Longitude): 21.61711, -158.08671
Time: 2020-02-02 16:54:47 -0700



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BASINPERIM	Perimeter of the drainage basin as defined in SIR 2004-5262	13.5	miles
BSLDEM10M	Mean basin slope computed from 10 m DEM	14.4	percent
CENTROIDY	Basin centroid vertical (y) location in state plane units	2389128.6	meters
COMPRAT	A measure of basin shape related to basin perimeter and drainage area	2.59	dimensionless

Parameter Code	Parameter Description	Value	Unit
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	169	feet per mi
DRNAREA	Area that drains to a point on a stream	2.18	square miles
ELEV	Mean Basin Elevation	593	feet
ELEV10FT	Elevation at 10 percent from outlet along longest flow path slope using DEM	112	feet
ELEV10FT3D	Elevation at 10 percent from outlet along longest flow path slope using 3D line	112	feet
ELEV85FT	Elevation at 85 percent from outlet along longest flow path slope using DEM	878	feet
ELEV85FT3D	Elevation at 85 percent from outlet along longest flow path slope using 3D line	874	feet
ELEVMAX	Maximum basin elevation	1180	feet
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	14.4	inches
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	8.85	inches
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	11	inches
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	5.25	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	18.8	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	12.7	inches
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	7.27	inches
I48H100Y	Maximum 48-hour precipitation that occurs on average once in 100 years	15.9	inches
I48H10Y	Maximum 48-hour precipitation that occurs on average once in 10 years	9.98	inches
I48H25Y	Maximum 48-hour precipitation that occurs on average once in 25 years	12.3	inches

Parameter Code	Parameter Description	Value	Unit
I48H2Y	Maximum 48-hour precipitation that occurs on average once in 2 years	6.08	inches
I48H500Y	Maximum 48-hour precipitation that occurs on average once in 500 years	20.2	inches
I48H50Y	Maximum 48-hour precipitation that occurs on average once in 50 years	14.1	inches
I48H5Y	Maximum 48-hour precipitation that occurs on average once in 5 years	8.27	inches
I60M100Y	Maximum 60-min precipitation that occurs on average once in 100 years	4.11	inches
I60M10Y	Maximum 60-min precipitation that occurs on average once in 10 years	2.69	inches
I60M25Y	Maximum 60-min precipitation that occurs on average once in 25 years	3.25	inches
I60M2Y	Maximum 60-min precipitation that occurs on average once in 2 years	1.75	inches
I60M500Y	Maximum 60-min precipitation that occurs on average once in 500 years	5.15	inches
I60M50Y	Maximum 60-min precipitation that occurs on average once in 50 years	3.68	inches
I60M5Y	Maximum 60-min precipitation that occurs on average once in 5 years	2.28	inches
I6H100Y	6-hour precipitation that is expected to occur on average once in 100 years	8.68	inches
I6H10Y	Maximum 6-hour precipitation that occurs on average once in 10 years	5.65	inches
I6H25Y	Maximum 6-hour precipitation that occurs on average once in 25 years	6.85	inches
I6H2Y	Maximum 6-hour precipitation that occurs on average once in 2 years	3.57	inches
I6H500Y	Maximum 6-hour precipitation that occurs on average once in 500 years	10.8	inches
I6H50Y	Maximum 6-hour precipitation that occurs on average once in 50 years	7.77	inches
I6H5Y	Maximum 6-hour precipitation that occurs on average once in 5 years	4.75	inches

Parameter Code	Parameter Description	Value	Unit
IMPNLCD01	Percentage of impervious area determined from NLCD 2001 impervious dataset	3.12	percent
LC01BARE	Percentage of area barren land, NLCD 2001 category 31	0	percent
LC01CROP	Percentage of area crop, NLCD 2001 category	9	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	15.2	percent
LC01DEVHI	Percentage of area developed, high intensity, NLCD 2001 category 24	0	percent
LC01DEVMD	Percentage of area developed, medium intensity, NLCD 2001 category 23	0	percent
LC01EVERG	Percentage of area evergreen forest, NLCD 2001 category 42	36	percent
LC01OPNLO	Percentage of area developed, open space and low intensity combined, NLCD2001 cat. 21 and 22	15	percent
LFPLENGTH	Length of longest flow path	6	miles
MINBELEV	Minimum basin elevation	4	feet
PERM12IN	Area-weighted average soil permeability for top 12 inches of soil	3.77	inches per hour
PERM24IN	Area-weighted average soil permeability for top 24 inches of soil	3.49	inches per hour
PRECIP	Mean Annual Precipitation	51.5	inches
RELIEF	Maximum - minimum elevation	1180	feet
RELRELF	Basin relief divided by basin perimeter	86.9	feet per mi
SLOP30_10M	Percent area with slopes greater than 30 percent from 10-meter NED	13	percent
SLPFM3D	Change in elevation divided by length between points 10 and 85 percent of distance along the longest flow path to the basin divide, LFP from 3D grid	195	feet per mi

Peak-Flow Statistics Parameters[Peak Region 3 2010 5035 Oahu leeward]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.18	square miles	0.56	45.1
PRECIP	Mean Annual Precipitation	51.5	inches	31.9	252

Peak-Flow Statistics Flow Report[Peak Region 3 2010 5035 Oahu leeward]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
2 Year Peak Flood	319	ft^3/s	51	51
5 Year Peak Flood	750	ft^3/s	42	42
10 Year Peak Flood	1170	ft^3/s	40	40
25 Year Peak Flood	1880	ft^3/s	40	40
50 Year Peak Flood	2550	ft^3/s	40	40
100 Year Peak Flood	3340	ft^3/s	41	41
500 Year Peak Flood	5710	ft^3/s	44	44

Peak-Flow Statistics Citations

Oki, D.S., Rosa, S.N., and Yeung, C.W.,2010, Flood-frequency estimates for streams on Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi, State of Hawaiʻi: U.S. Geological Survey Scientific Investigations Report 2010-5035, 121 p. (http://pubs.usgs.gov/sir/2010/5035/)

Application Version: 4.3.11

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Fax: +1 317 972-1708
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Exhibit 2: Existing Structure Plans

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	3D	1936	1	48

- INDEX TO DRAWINGS -

TERRITORY OF HAWAII

TERRITORIAL HIGHWAY DEPARTMENT

HONOLULU T.H.

PLANS OF

KAMEHAMEHA HIGHWAY

FEDERAL AID PROJECT NO 3-D

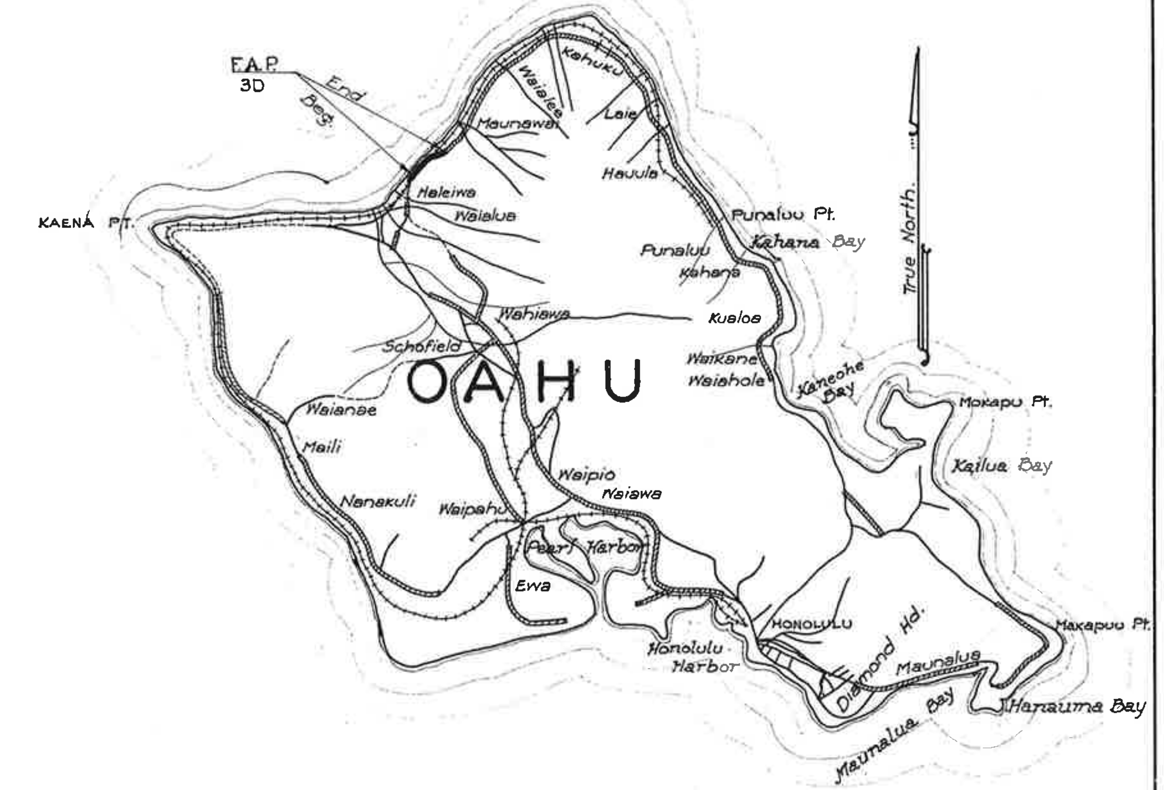
DISTRICT OF WAIALUA
ISLAND OF OAHU.

SCALES

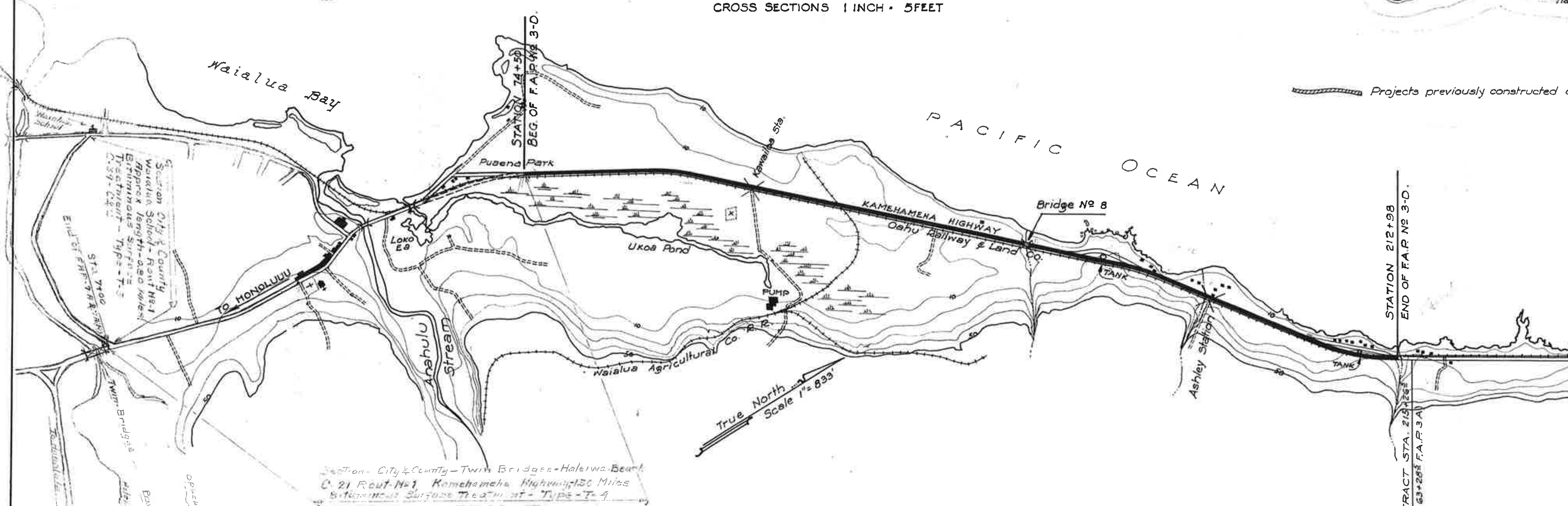
PLAN	1 INCH = 50 FEET
PROFILE — HORIZ	1 INCH = 50 FEET
PROFILE — VERT	1 INCH = 10 FEET
CROSS SECTIONS	1 INCH = 5 FEET

CONVENTIONAL SIGNS

- EXISTING ROAD
- EXISTING FENCE
- BOUNDARY LINE (NOT FENCED)
- EXISTING STONE FENCE
- RAILROAD
- CENTER LINE
- LARGE TREE
- CEMENT RUBBLE RETAINING WALL
- BRIDGES
- CULVERTS



Projects previously constructed or under construction.



LAYOUT OF PROJECT

GROSS LENGTH	2.622 MILES.
BRIDGES OVER 20 FT.	.013 " .
NET LENGTH	2.609 " .

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DESIGNED BY	
	DRAWN BY C.T. Wagner	7/36
NOTE BOOK	TRACED BY C.T. Wagner R.E. Smith	"
	QUANTITIES BY	
No.	CHECKED BY	

APPROVED

Louis S Cain

DATE. 11-5-36

Territorial Highway Engineer.

RECOMMENDED FOR APPROVAL

[redacted]

Principal Highway Engr. Bureau of Pub. Rds.

RECOMMENDED FOR APPROVAL

[redacted]

Chief Engineer, Bureau of Pub. Roads.

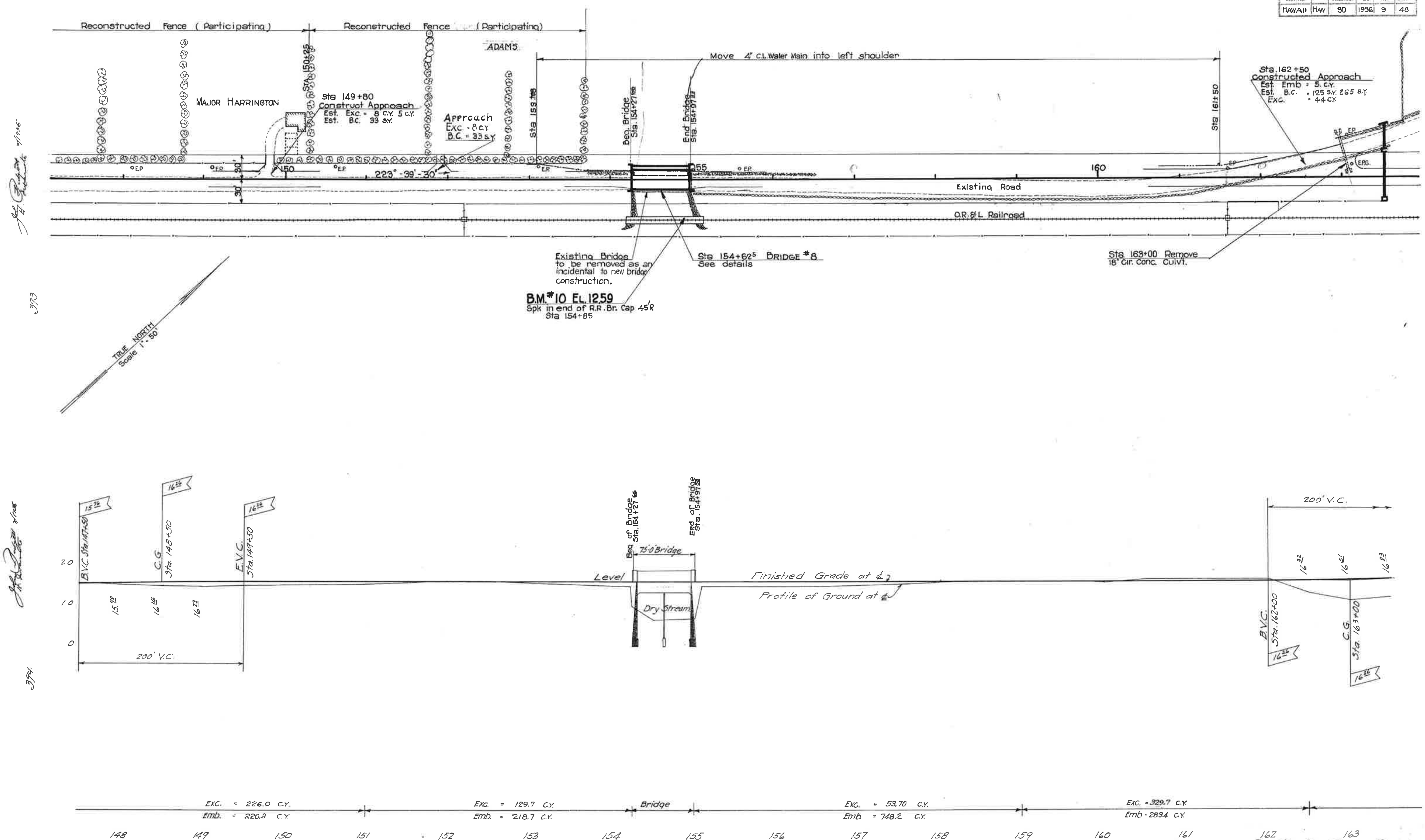
APPROVED

[redacted]

Chief, Bureau of Public Roads.

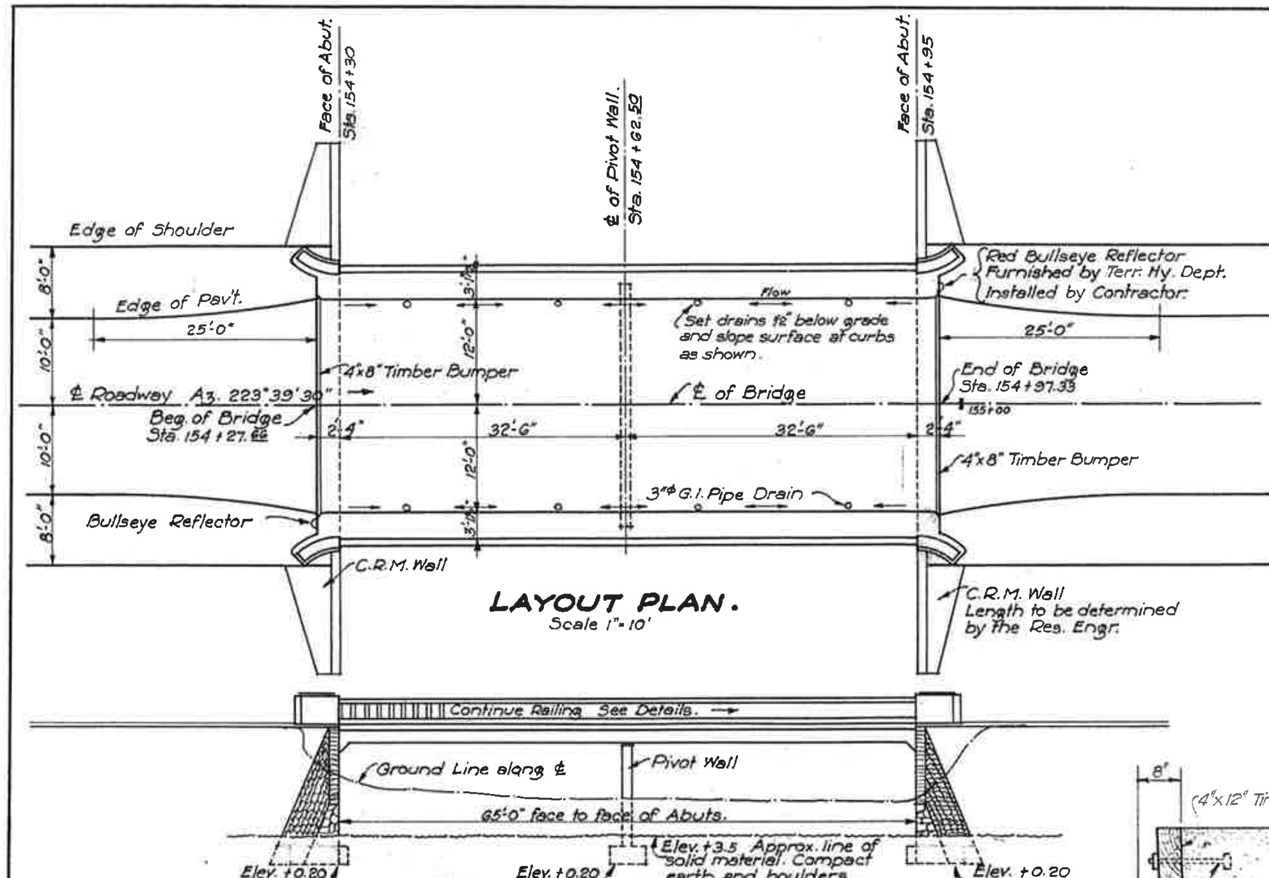
4385.1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	90	1936	9	48



4385.9

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
Hawaii	Haw	3D	1936	18	48



LAYOUT PLAN.
Scale 1"=10'

UPSTREAM ELEVATION.
Scale 1"=10'

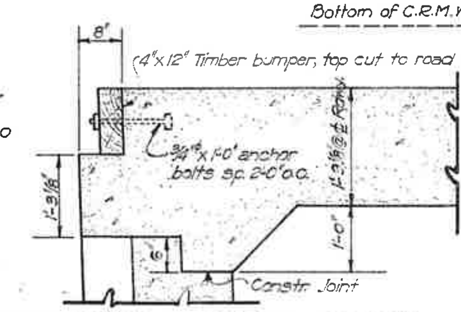
✦ CONTRACTORS NOTE ✦
Footings must be excavated to neat lines. Backfilling to proceed uniformly & evenly at both ends of Bridge.

NOTE! Timber bumper & braket revised. See Revised Detail

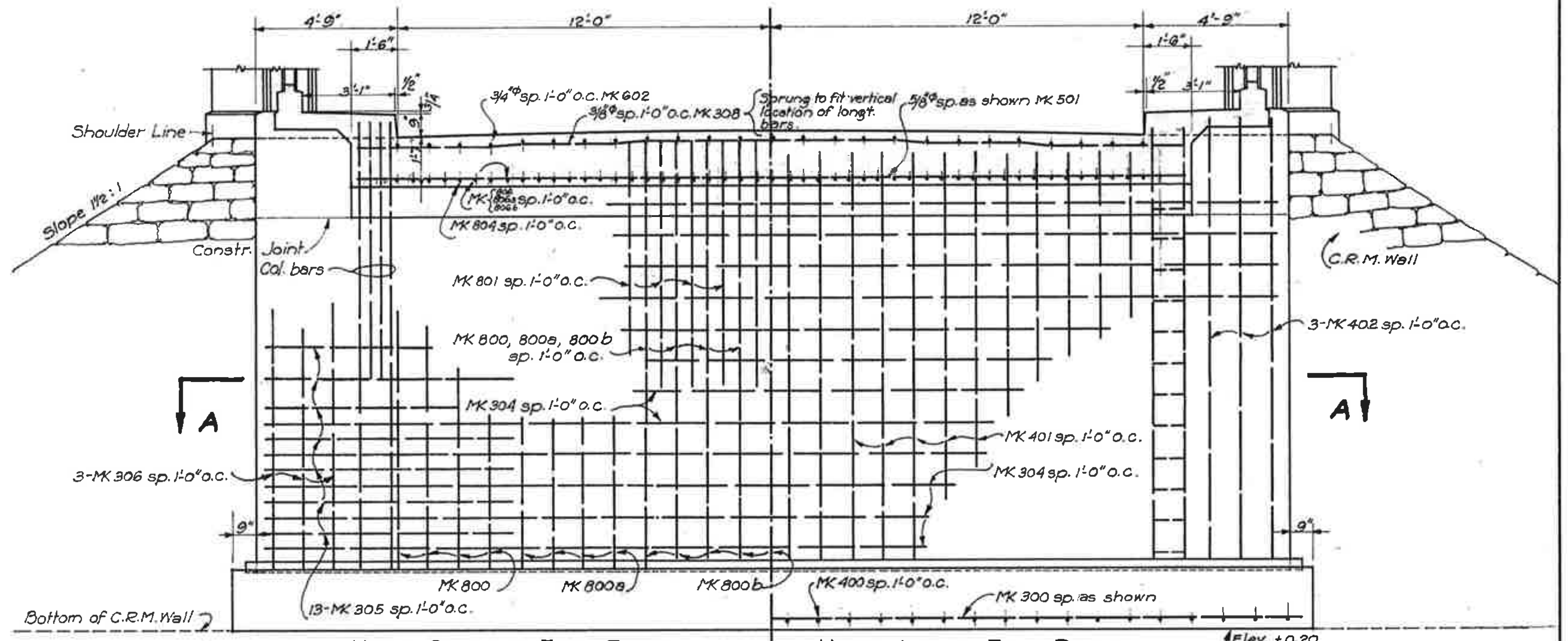
Timber bumper & bracket Revised Mar. 24, 1937
Revised Jan. 15, 1937

TABLE OF QUANTITIES.

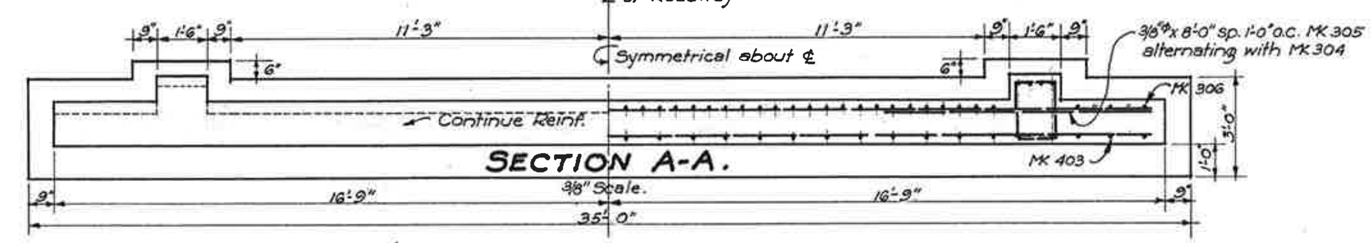
LOCATION	STR. EXC.	CLASS "A" CONC.	STEEL	C.R.M.
Footings	125.0	24.4	776	
Piers & Abuts.		49.5	9452	
Superstr.		137.1	18,487	
Railing		11.7	939	
C.R.M.	100.0			97
Total.	225.0	222.7	29,654	97



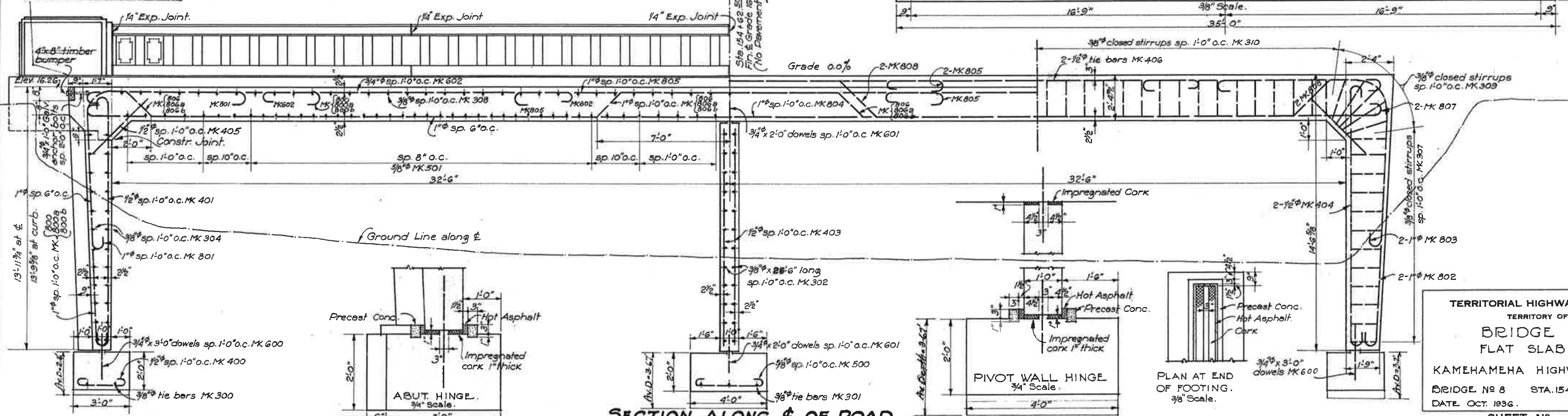
REVISED DETAIL OF TIMBER BUMPER
Scale 3/4"=1'-0"



ABUTMENT AT END OF BRIDGE.
3/8" Scale.



SECTION A-A.
3/8" Scale.



SECTION ALONG ℄ OF ROAD.
3/8" Scale.

ORIGINAL PLAN		DATE
SURVEY PLOTTED BY		
DESIGNED BY	V.E. Bartels	Oct. 1936
DRAWN BY	G.T. Wagner	"
TRACED BY		
QUANTITIES BY	C.K. Kong	"
CHECKED BY	V.E. Bartels	"
NOTE BOOK No.		

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
BRIDGE Nº 8
FLAT SLAB DESIGN
KAMEHAMEHA HIGHWAY F.A.P. 3-D.
BRIDGE Nº 8 STA. 154+27.92 TO 154+97.33
DATE OCT. 1936. SCALES AS NOTED.

SHEET Nº OF SHEETS
4385.18

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Exhibit 3: Proposed Structure Plans

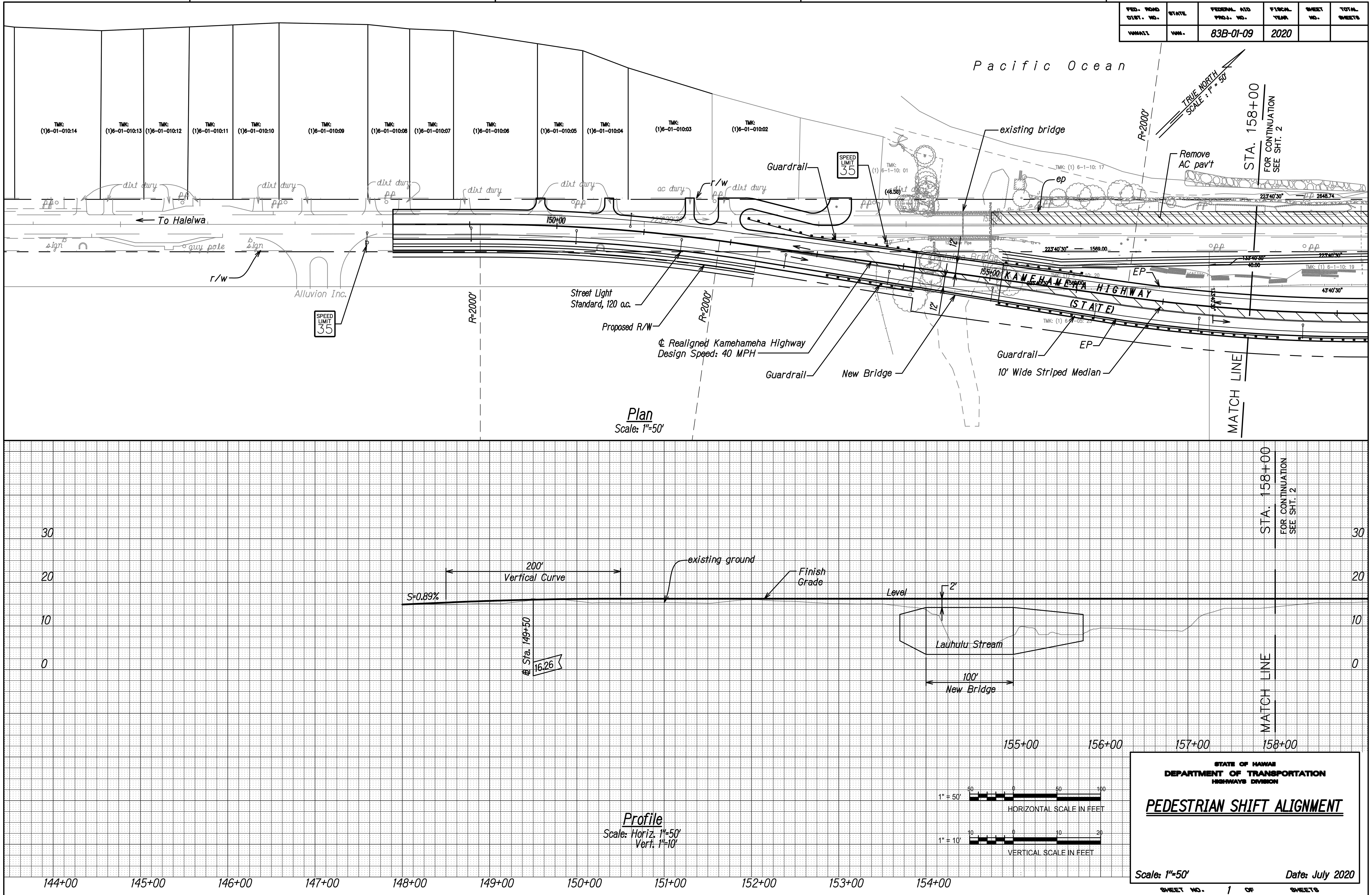
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83B-01-09	2020		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTRIAN SHIFT ALIGNMENT

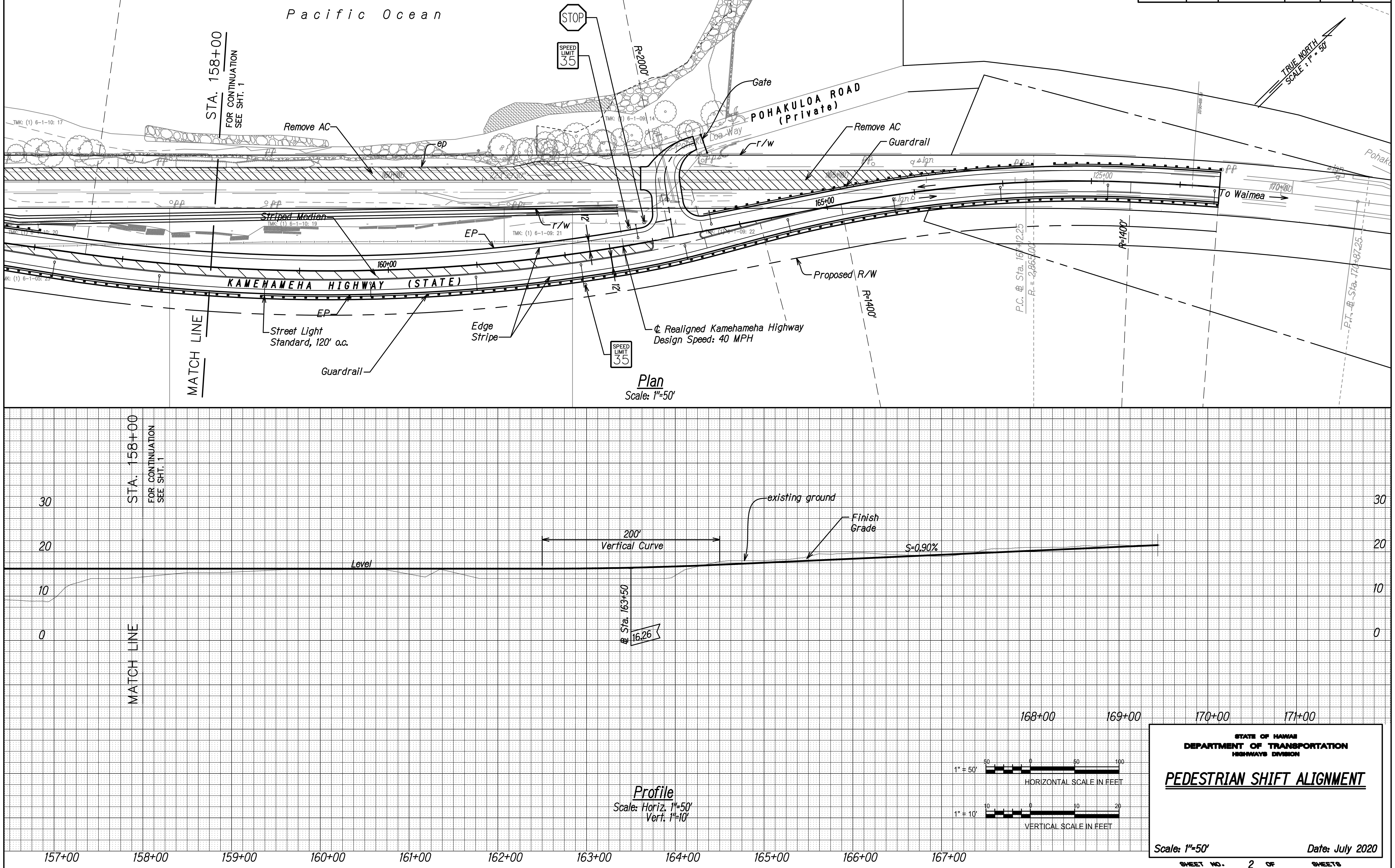
Scale: 1"=50' Date: July 2020

SHEET NO. 1 OF SHEETS



SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
ORIGINAL PLAN
NOTE BOOK
No.
DATE

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83B-01-09	2020		



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTRIAN SHIFT ALIGNMENT

Scale: 1"=50' Date: July 2020

SHEET NO. 2 OF SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

Suite 1270S
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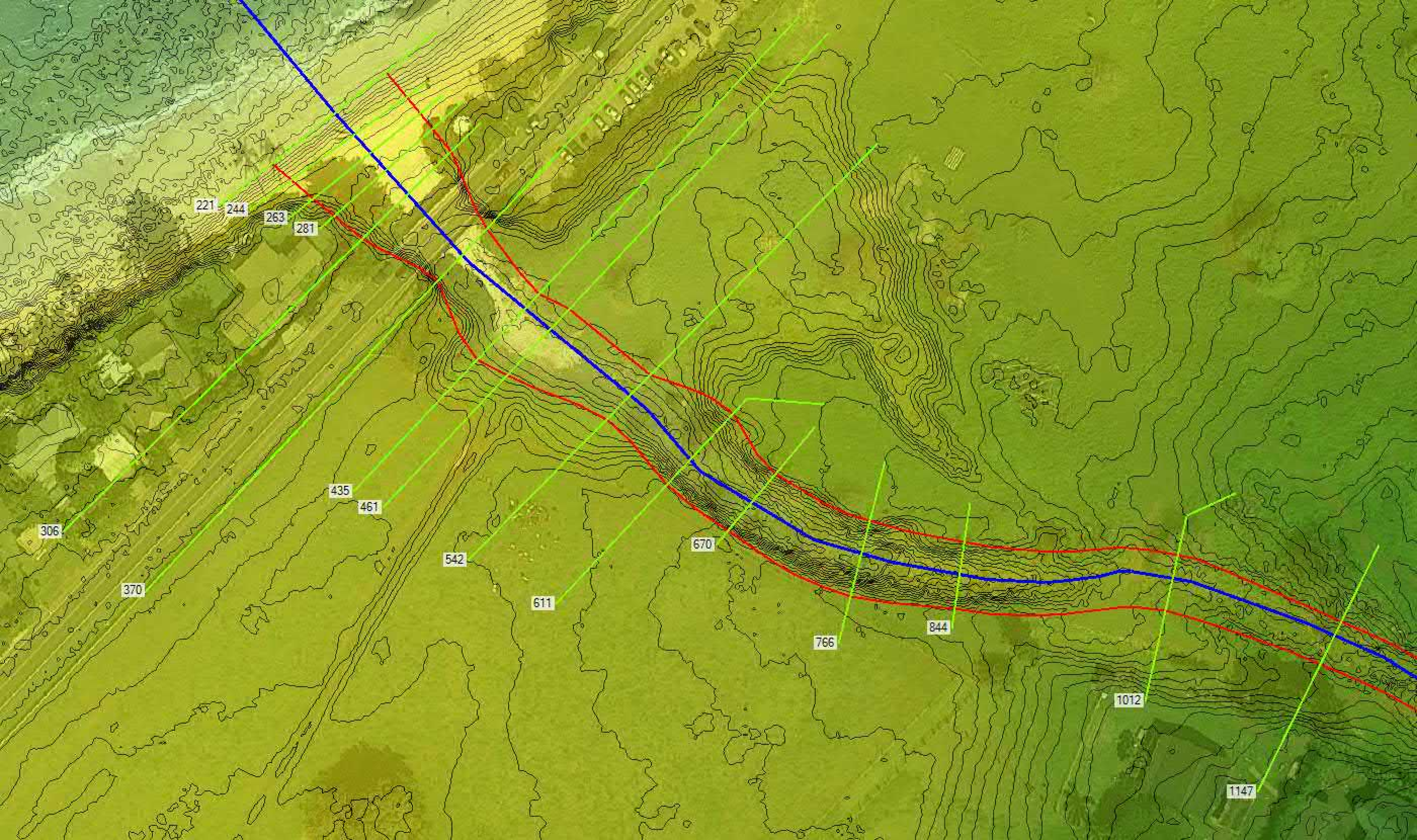
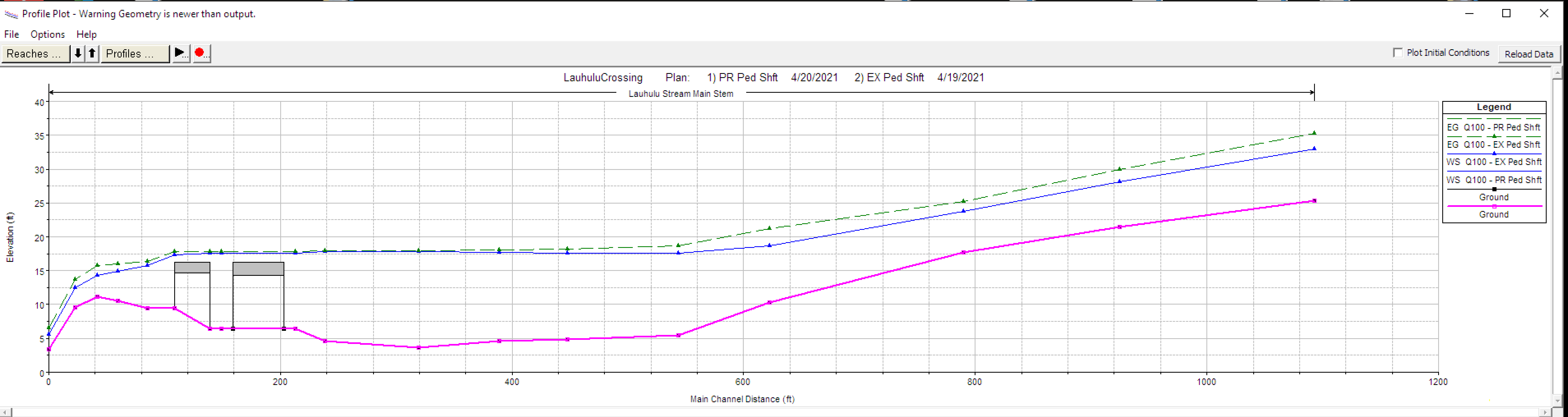
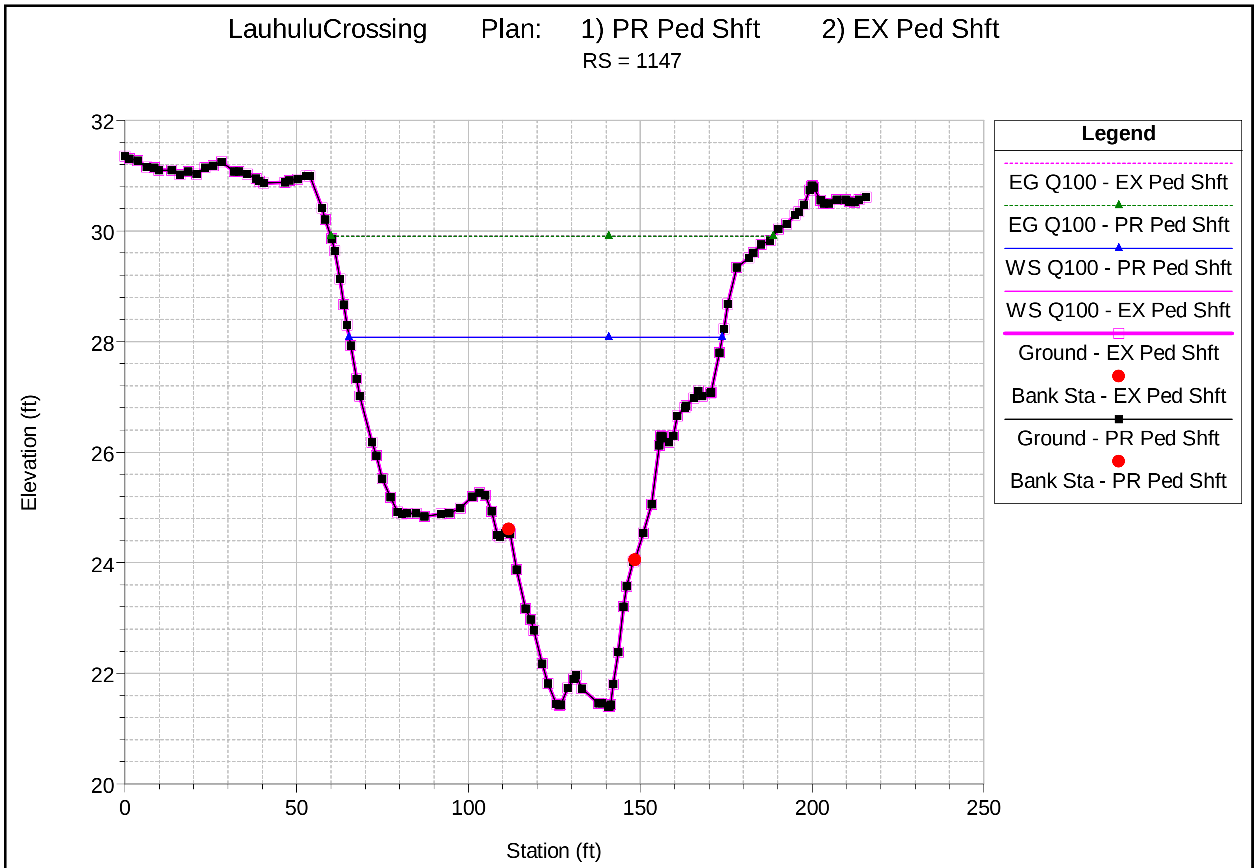
Exhibit 4
HEC-RAS Output and Plots
Laniakea Stream - Pedestrian Shift

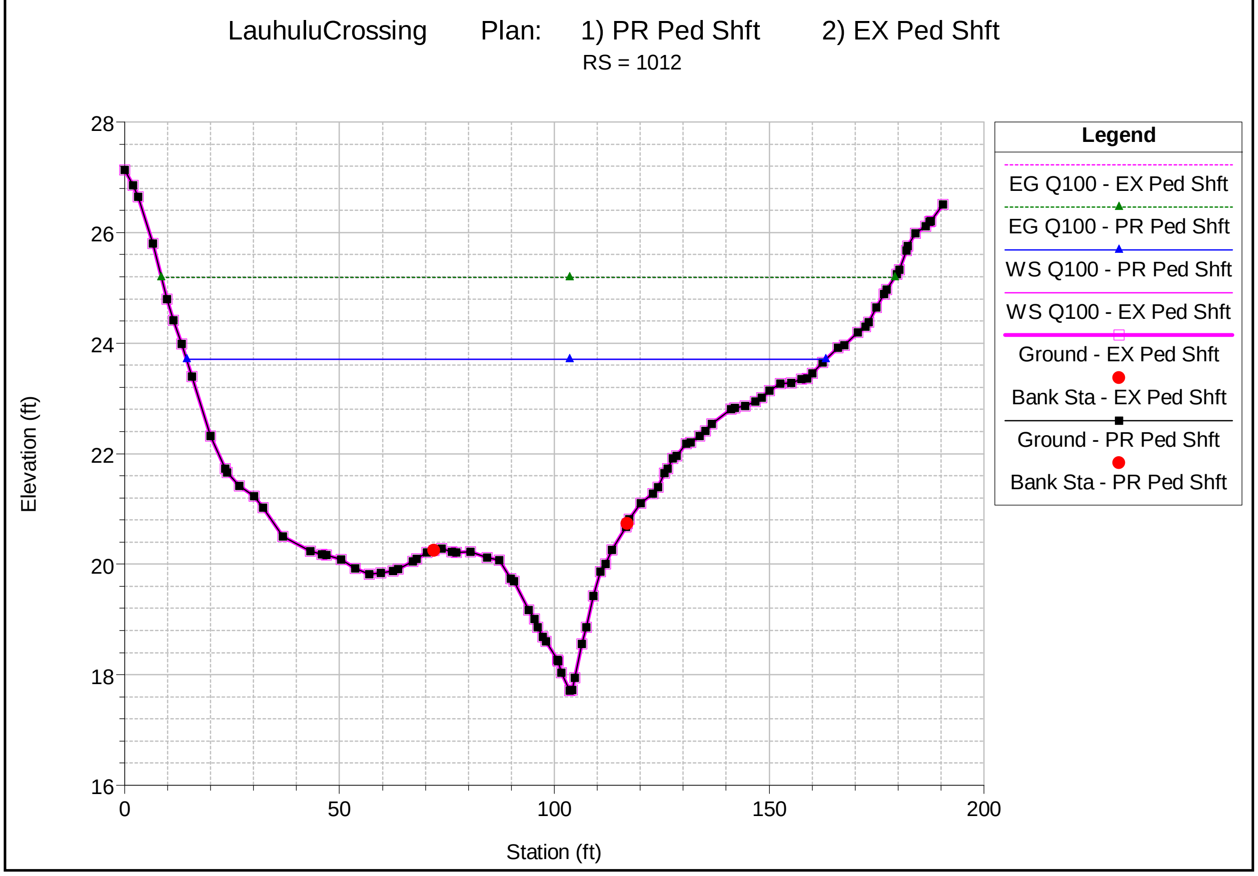

221
244
263
281
306
370
435
461
542
611
670
766
844
1012
1147


Profile Plot - Warning Geometry is newer than output.
File Options Help
Reaches ... Profiles ...
Plot Initial Conditions
Reload Data
LauhuluCrossing Plan: 1) PR Ped Shft 4/20/2021 2) EX Ped Shft 4/19/2021
Lauhulu Stream Main Stem
Legend
EG Q100 - PR Ped Shft
EG Q100 - EX Ped Shft
WS Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
Ground
Ground
Elevation (ft)
0
5
10
15
20
25
30
35
40
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

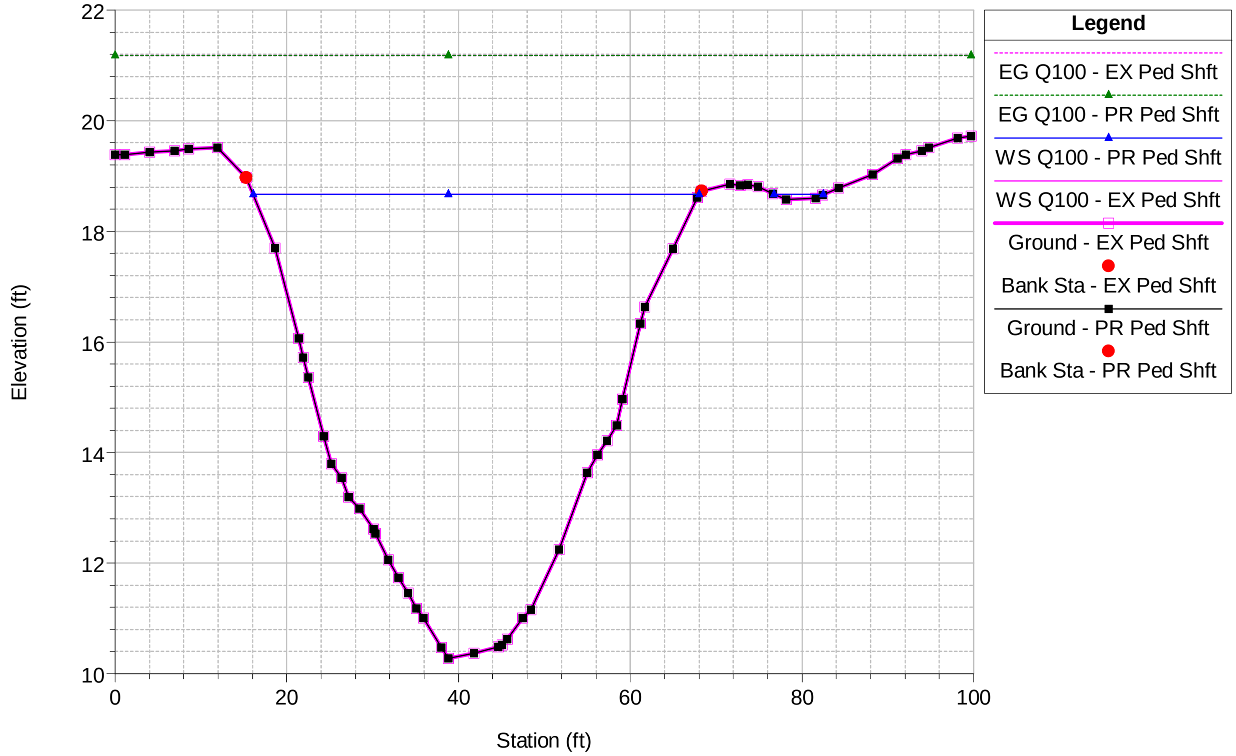
HEC-RAS River: Lauhulu Stream Reach: Main Stem Profile: Q100

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main Stem	1316	Q100	PR Ped Shft	3340.00	25.31	32.94	32.94	35.26	0.013167	13.03	326.75	78.28	0.90
Main Stem	1316	Q100	EX Ped Shft	3340.00	25.31	32.94	32.94	35.26	0.013167	13.03	326.75	78.28	0.90
Main Stem	1147	Q100	PR Ped Shft	3340.00	21.40	28.08	28.08	29.90	0.013566	12.11	384.65	108.56	0.89
Main Stem	1147	Q100	EX Ped Shft	3340.00	21.40	28.08	28.08	29.90	0.013566	12.11	384.65	108.56	0.89
Main Stem	1012	Q100	PR Ped Shft	3340.00	17.71	23.71	23.71	25.19	0.018219	11.45	414.32	148.77	0.99
Main Stem	1012	Q100	EX Ped Shft	3340.00	17.71	23.71	23.71	25.19	0.018219	11.45	414.32	148.77	0.99
Main Stem	844	Q100	PR Ped Shft	3340.00	10.28	18.67	18.67	21.17	0.018469	12.70	263.41	57.71	0.99
Main Stem	844	Q100	EX Ped Shft	3340.00	10.28	18.67	18.67	21.17	0.018469	12.70	263.41	57.71	0.99
Main Stem	766	Q100	PR Ped Shft	3340.00	5.41	17.61		18.67	0.005160	8.25	405.74	66.67	0.54
Main Stem	766	Q100	EX Ped Shft	3340.00	5.41	17.61		18.67	0.005174	8.26	405.22	66.40	0.54
Main Stem	670	Q100	PR Ped Shft	3340.00	4.83	17.55		18.22	0.002500	6.60	522.09	100.28	0.39
Main Stem	670	Q100	EX Ped Shft	3340.00	4.83	17.54		18.22	0.002508	6.60	521.31	99.95	0.40
Main Stem	611	Q100	PR Ped Shft	3340.00	4.56	17.71		18.03	0.001066	4.58	797.87	272.92	0.27
Main Stem	611	Q100	EX Ped Shft	3340.00	4.56	17.70		18.02	0.001069	4.59	796.93	272.68	0.27
Main Stem	542	Q100	PR Ped Shft	3340.00	3.62	17.84		17.92	0.000245	2.78	1800.44	457.50	0.14
Main Stem	542	Q100	EX Ped Shft	3340.00	3.62	17.84		17.91	0.000245	2.78	1798.96	457.50	0.14
Main Stem	461	Q100	PR Ped Shft	3340.00	4.59	17.84	9.44	17.90	0.000187	2.38	1841.14	509.60	0.12
Main Stem	461	Q100	EX Ped Shft	3340.00	4.59	17.85	9.34	17.89	0.000118	1.89	2588.60	509.60	0.10
Main Stem	435	Q100	PR Ped Shft	3340.00	6.42	17.58	11.55	17.84	0.000792	4.48	1248.55	575.90	0.24
Main Stem	435	Q100	EX Ped Shft	3340.00	6.42	17.61	11.55	17.86	0.000780	4.45	1258.21	575.90	0.24
Main Stem	400			Bridge									
Main Stem	370	Q100	PR Ped Shft	3340.00	6.42	17.55	11.55	17.82	0.000805	4.51	1237.81	575.90	0.24
Main Stem	370	Q100	EX Ped Shft	3340.00	6.42	17.55	11.55	17.82	0.000805	4.51	1237.81	575.90	0.24
Main Stem	350			Bridge									
Main Stem	306	Q100	PR Ped Shft	3340.00	9.49	15.71	13.56	16.32	0.004046	6.34	555.54	130.71	0.48
Main Stem	306	Q100	EX Ped Shft	3340.00	9.49	15.71	13.56	16.32	0.004046	6.34	555.54	130.71	0.48
Main Stem	281	Q100	PR Ped Shft	3340.00	10.54	14.93		16.02	0.011549	8.49	408.52	133.47	0.78
Main Stem	281	Q100	EX Ped Shft	3340.00	10.54	14.93		16.02	0.011549	8.49	408.52	133.47	0.78
Main Stem	263	Q100	PR Ped Shft	3340.00	11.15	14.31	14.31	15.71	0.021399	9.78	366.90	140.53	1.02
Main Stem	263	Q100	EX Ped Shft	3340.00	11.15	14.31	14.31	15.71	0.021399	9.78	366.90	140.53	1.02
Main Stem	244	Q100	PR Ped Shft	3340.00	9.63	12.52	12.52	13.74	0.026116	9.58	402.89	169.90	1.09
Main Stem	244	Q100	EX Ped Shft	3340.00	9.63	12.52	12.52	13.74	0.026116	9.58	402.89	169.90	1.09
Main Stem	221	Q100	PR Ped Shft	3340.00	3.35	5.55	5.55	6.56	0.034199	9.00	431.44	217.90	1.19
Main Stem	221	Q100	EX Ped Shft	3340.00	3.35	5.55	5.55	6.56	0.034199	9.00	431.44	217.90	1.19

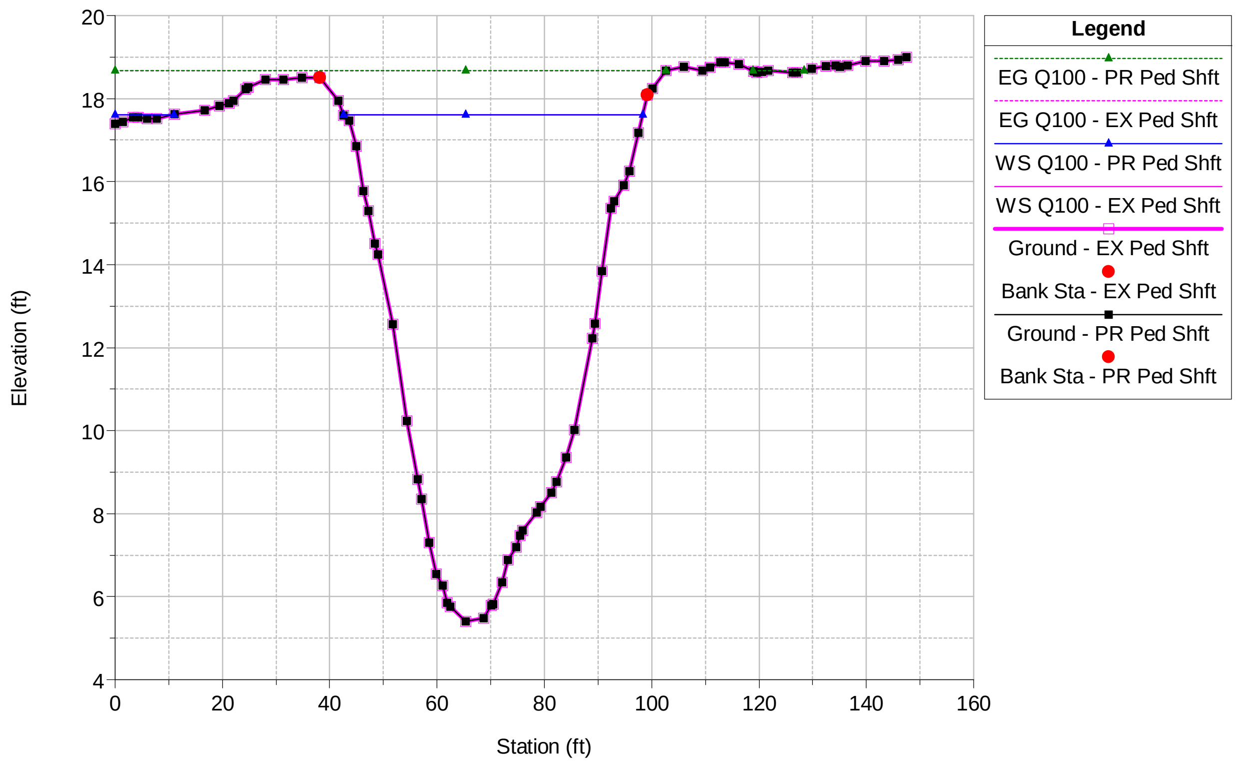

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 1147
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
Ground - EX Ped Shft
Bank Sta - EX Ped Shft
Ground - PR Ped Shft
Bank Sta - PR Ped Shft
Elevation (ft)
Station (ft)
32
30
28
26
24
22
20
0
50
100
150
200
250

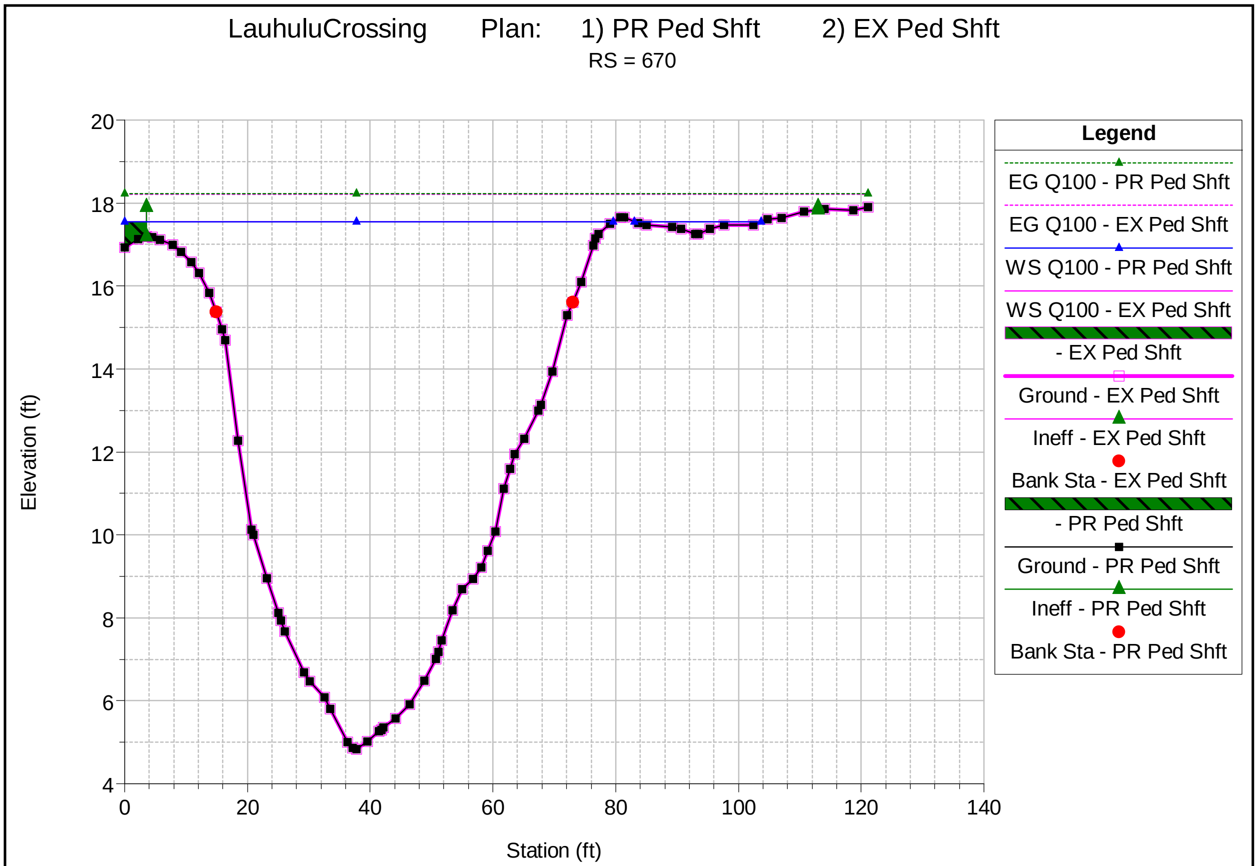

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 1012
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
Ground - EX Ped Shft
Bank Sta - EX Ped Shft
Ground - PR Ped Shft
Bank Sta - PR Ped Shft
Elevation (ft)
Station (ft)
28
26
24
22
20
18
16
0
50
100
150
200

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 844

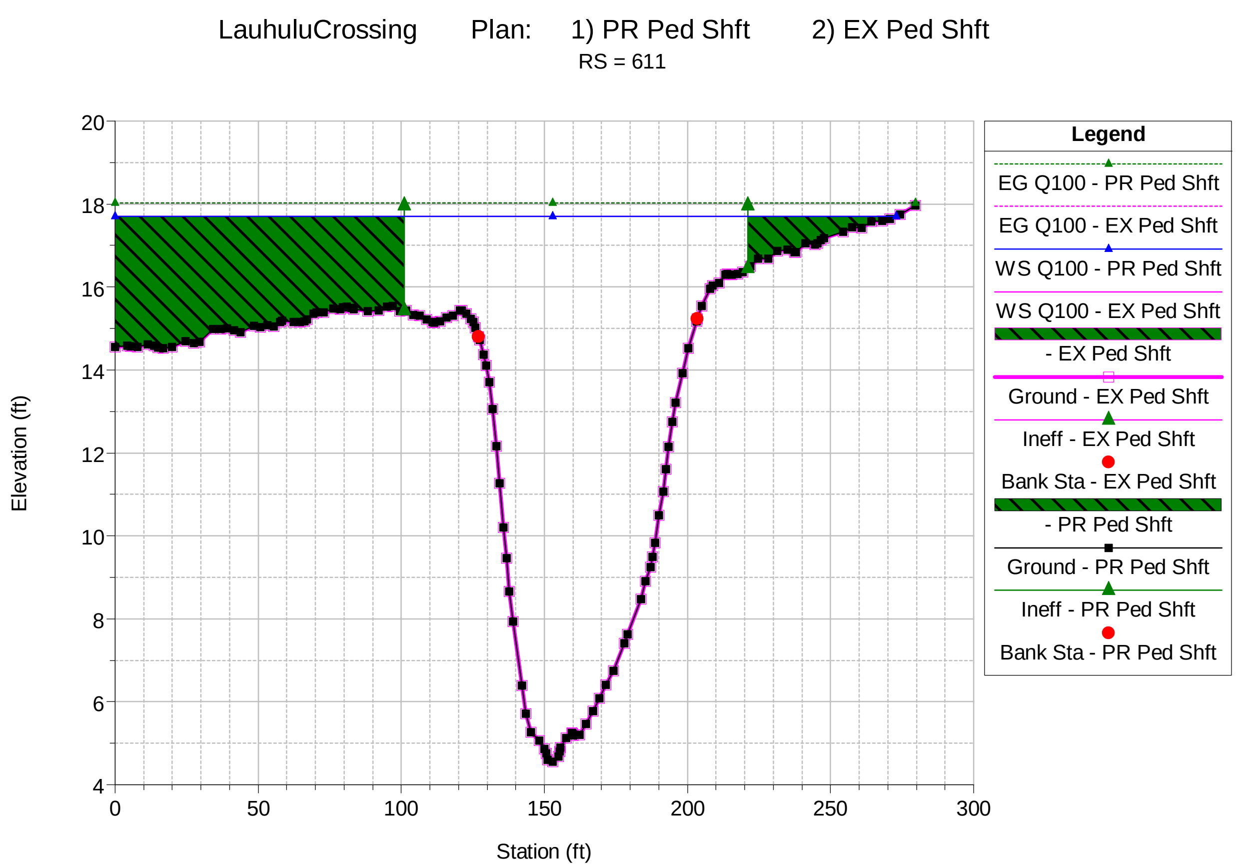


LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 766

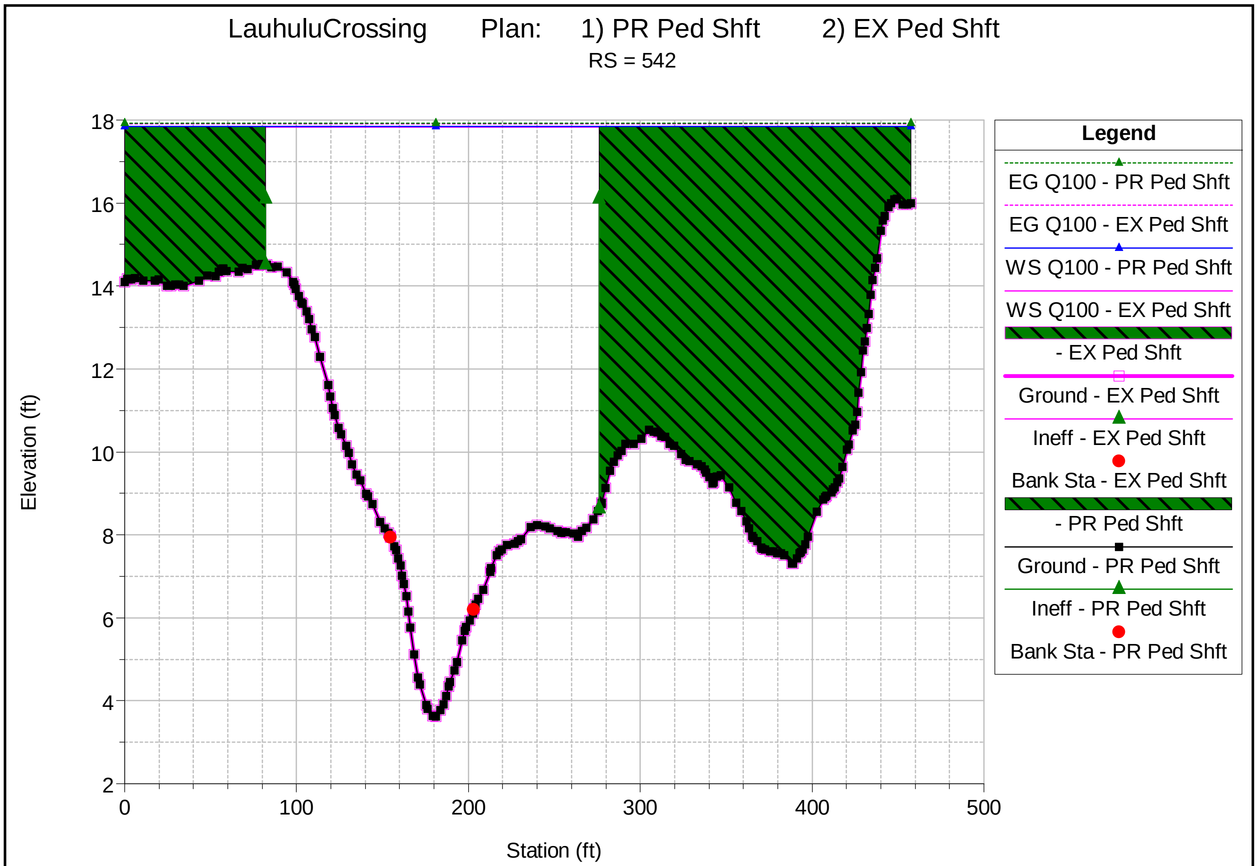


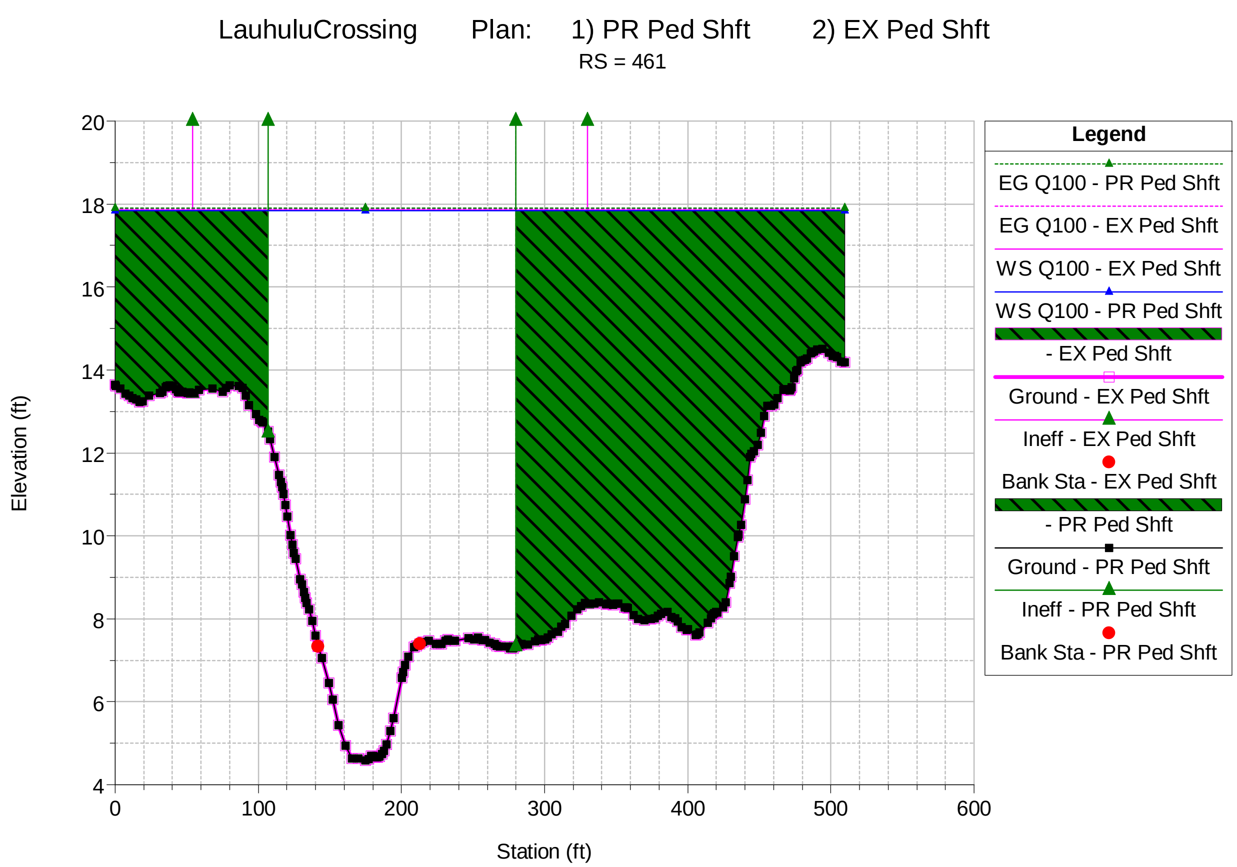


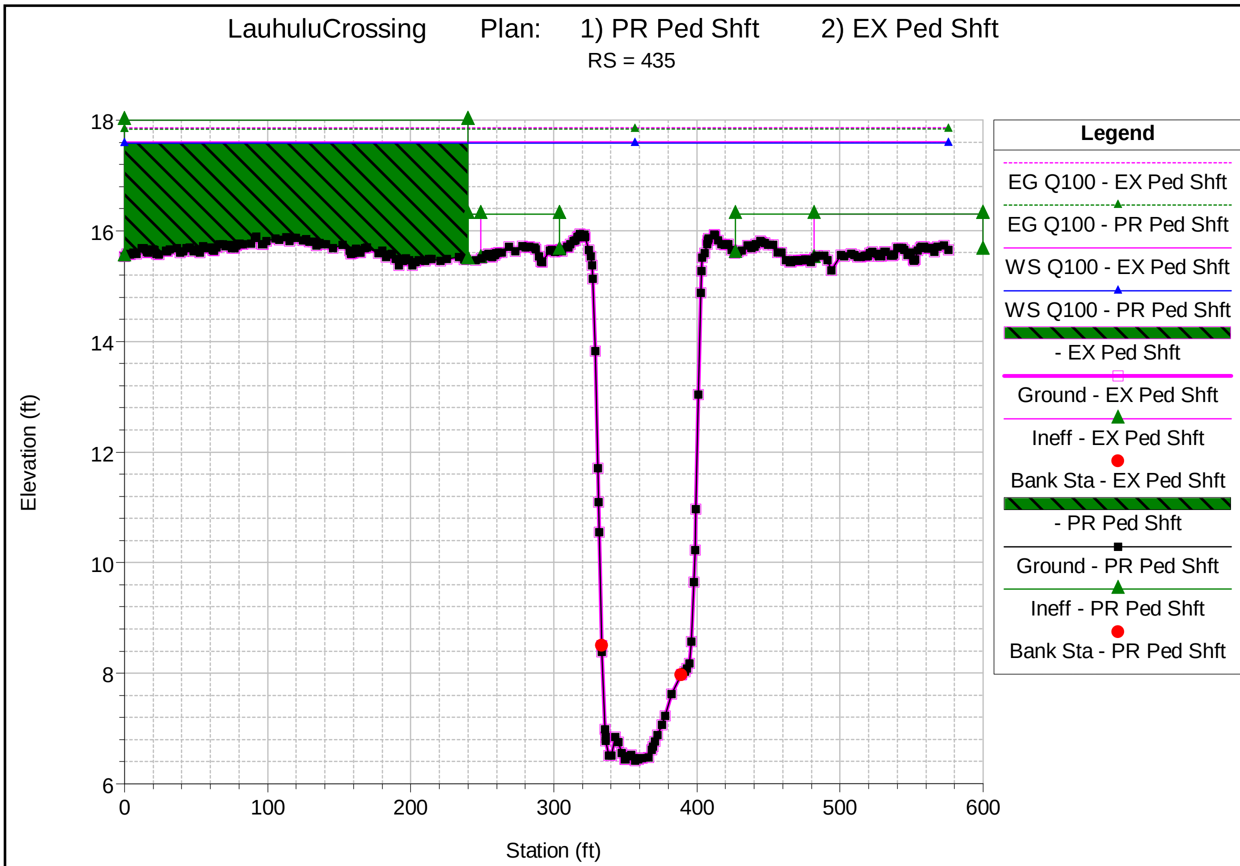
LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 670
Elevation (ft)
Station (ft)
20
18
16
14
12
10
8
6
4
0
20
40
60
80
100
120
140
Legend
EG Q100 - PR Ped Shft
EG Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft



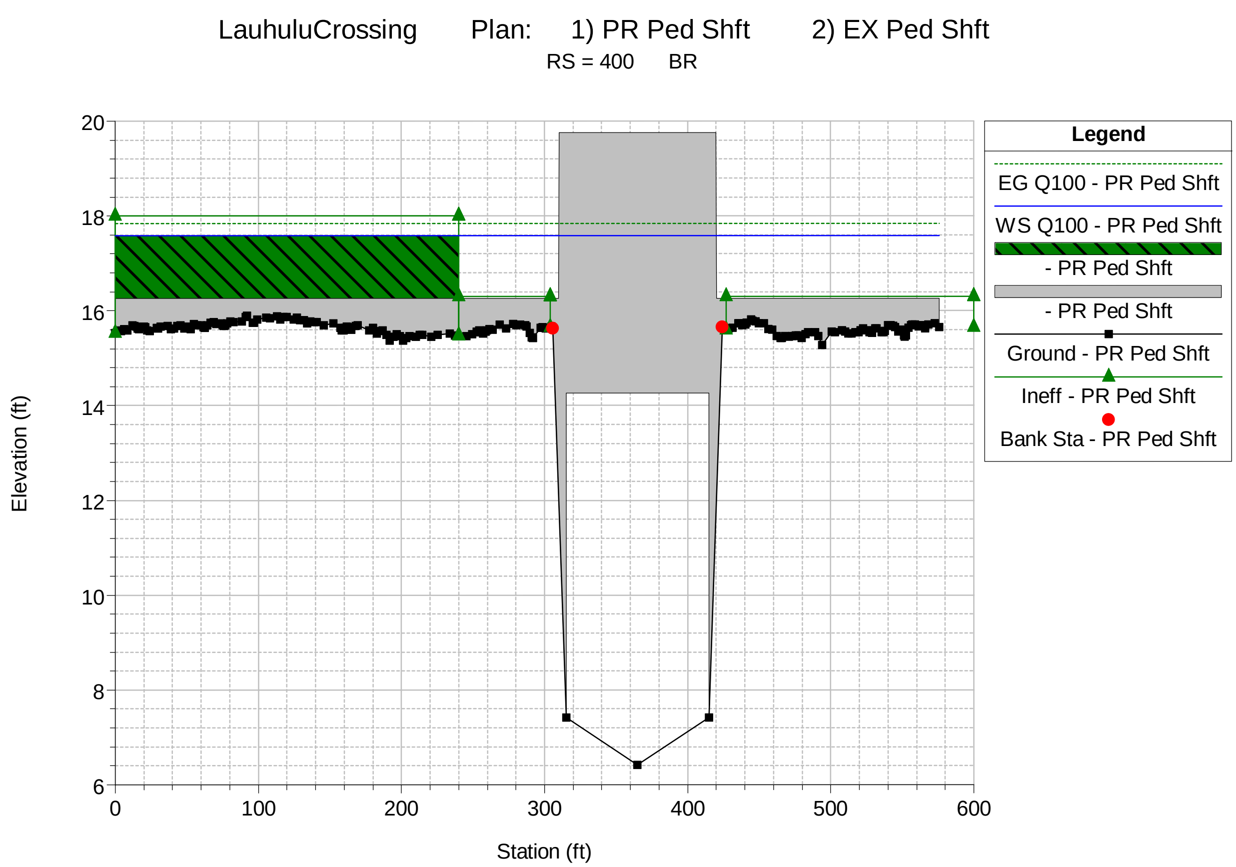
LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 611
Elevation (ft)
Station (ft)
20
18
16
14
12
10
8
6
4
0
50
100
150
200
250
300
Legend
EG Q100 - PR Ped Shft
EG Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft


LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 542
Elevation (ft)
Station (ft)
18
16
14
12
10
8
6
4
2
0
100
200
300
400
500
Legend
EG Q100 - PR Ped Shft
EG Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft

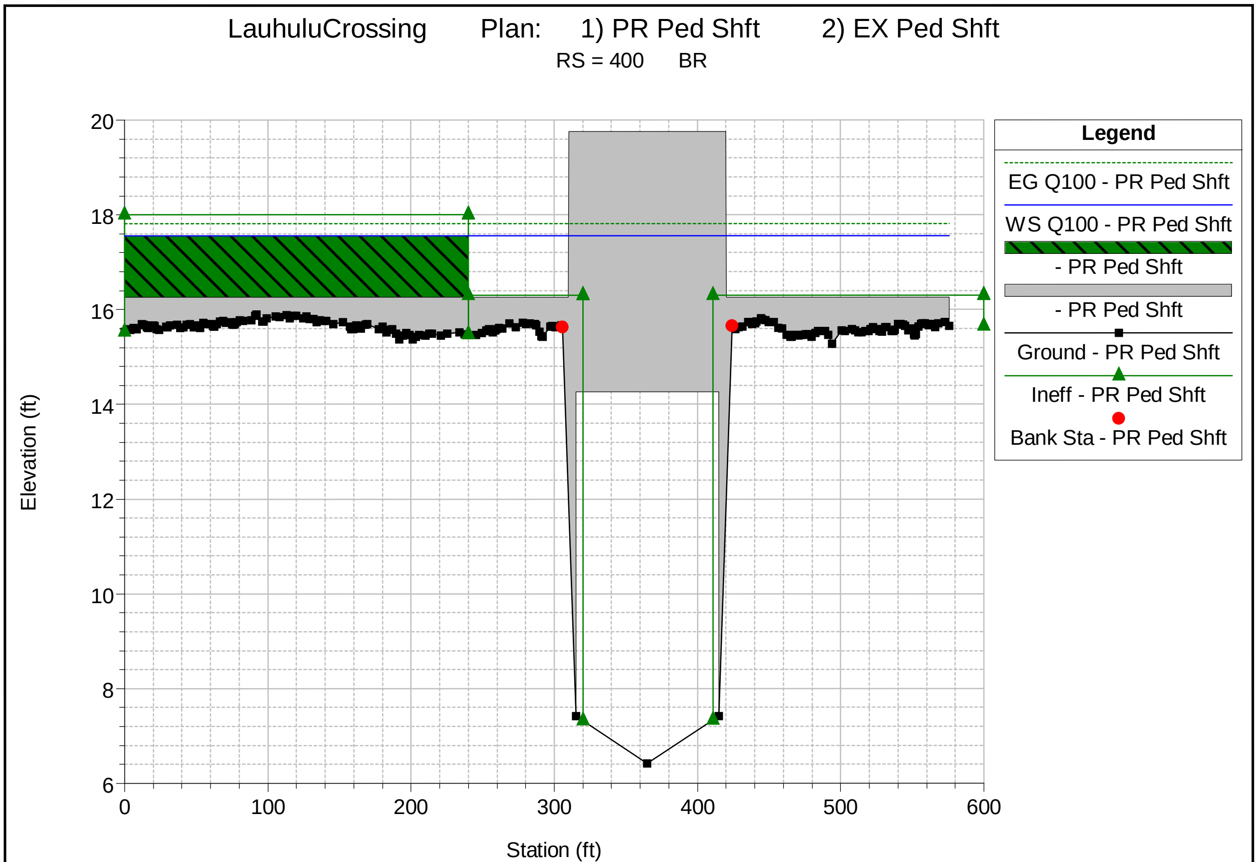

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 461
Elevation (ft)
Station (ft)
20
18
16
14
12
10
8
6
4
0
100
200
300
400
500
600
Legend
EG Q100 - PR Ped Shft
EG Q100 - EX Ped Shft
WS Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft

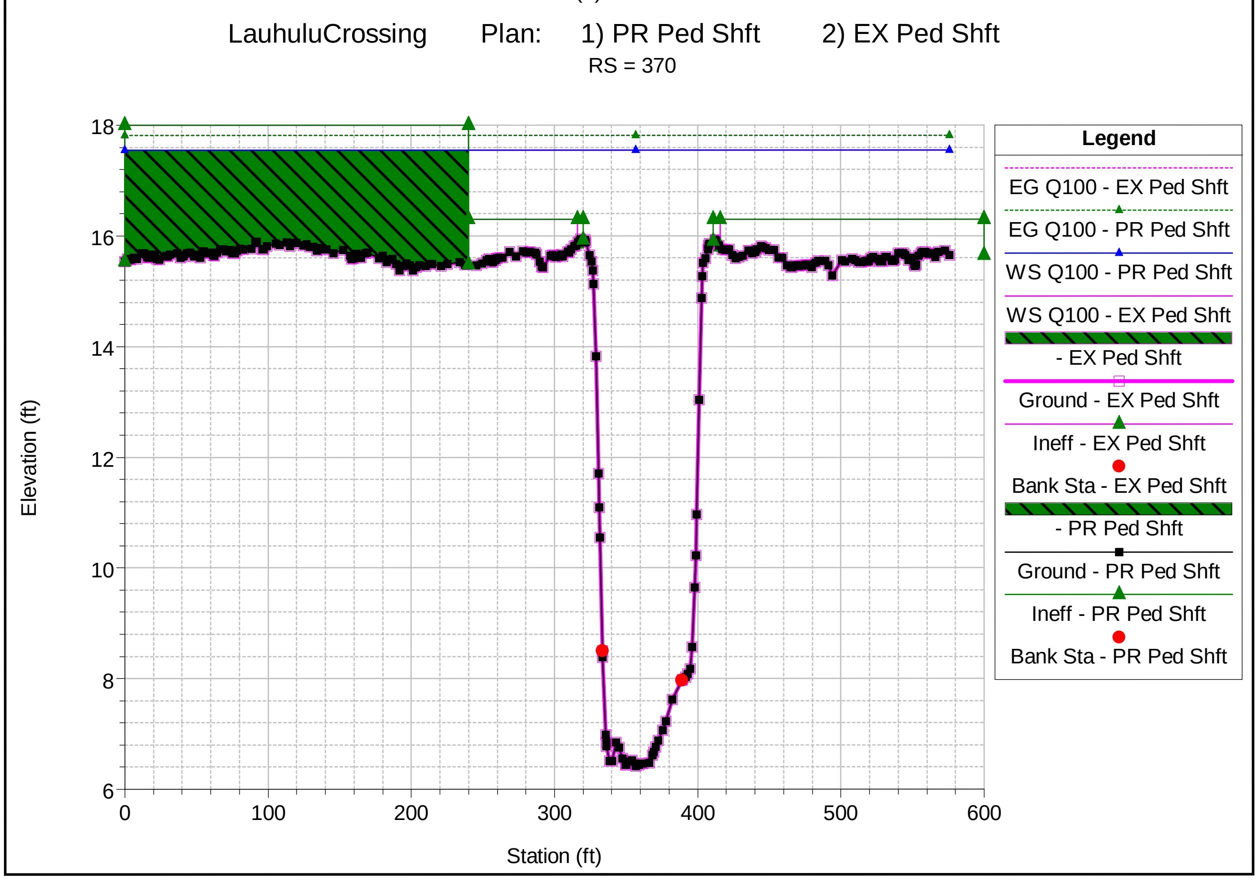


LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 435
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
WS Q100 - PR Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft
Elevation (ft)
Station (ft)

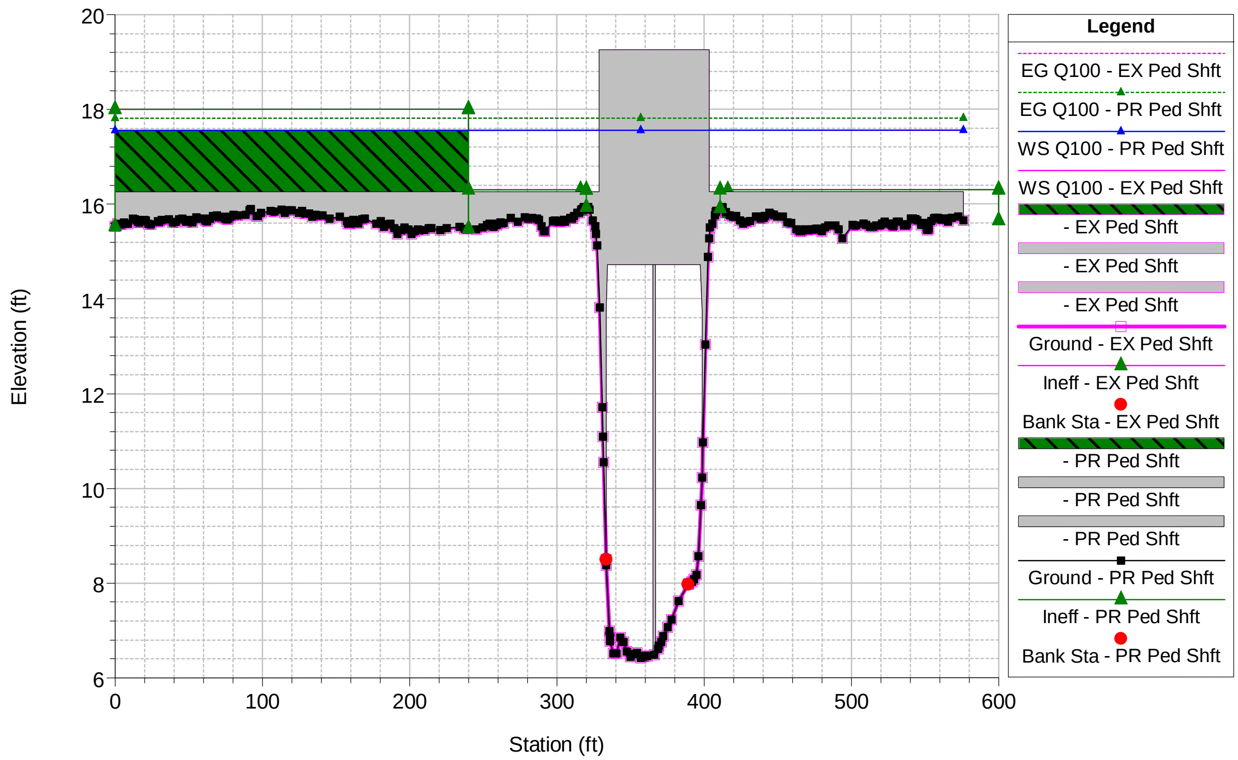


LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 400 BR
Legend
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
- PR Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft
Elevation (ft)
Station (ft)

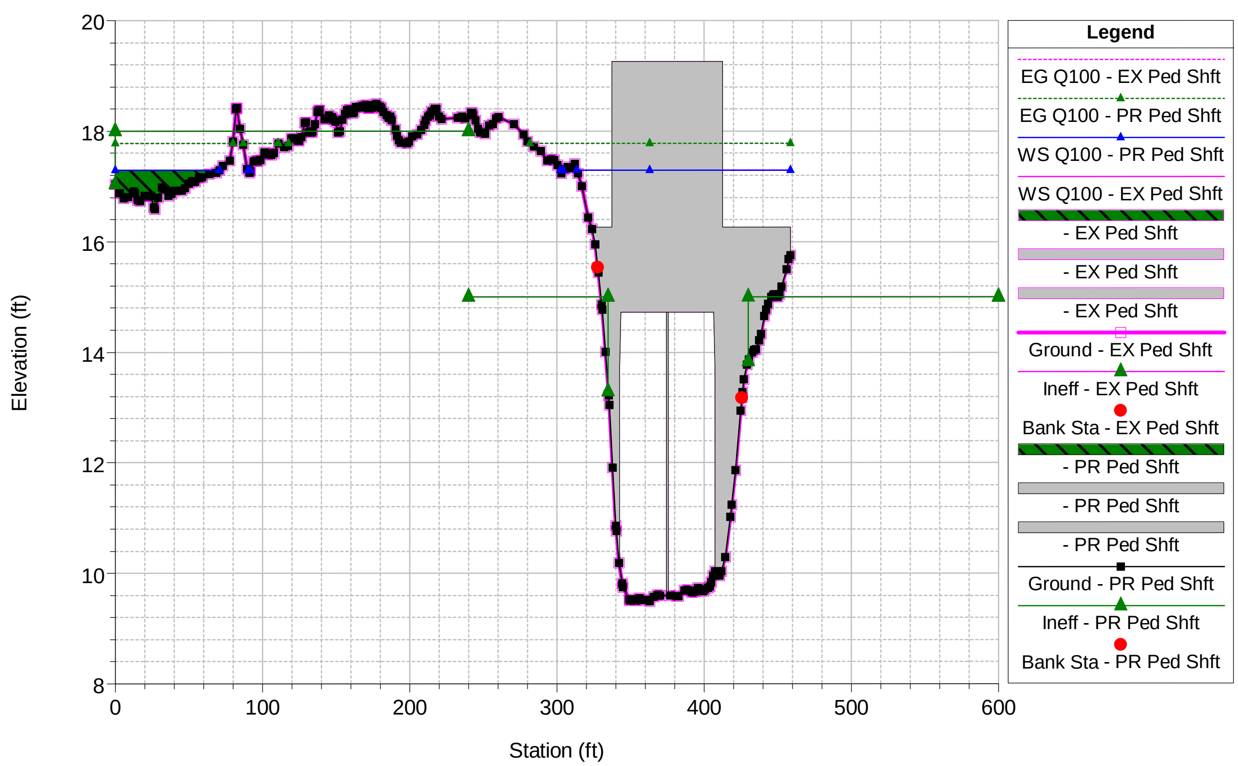

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 400 BR
Elevation (ft)
Station (ft)
Legend
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
- PR Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft

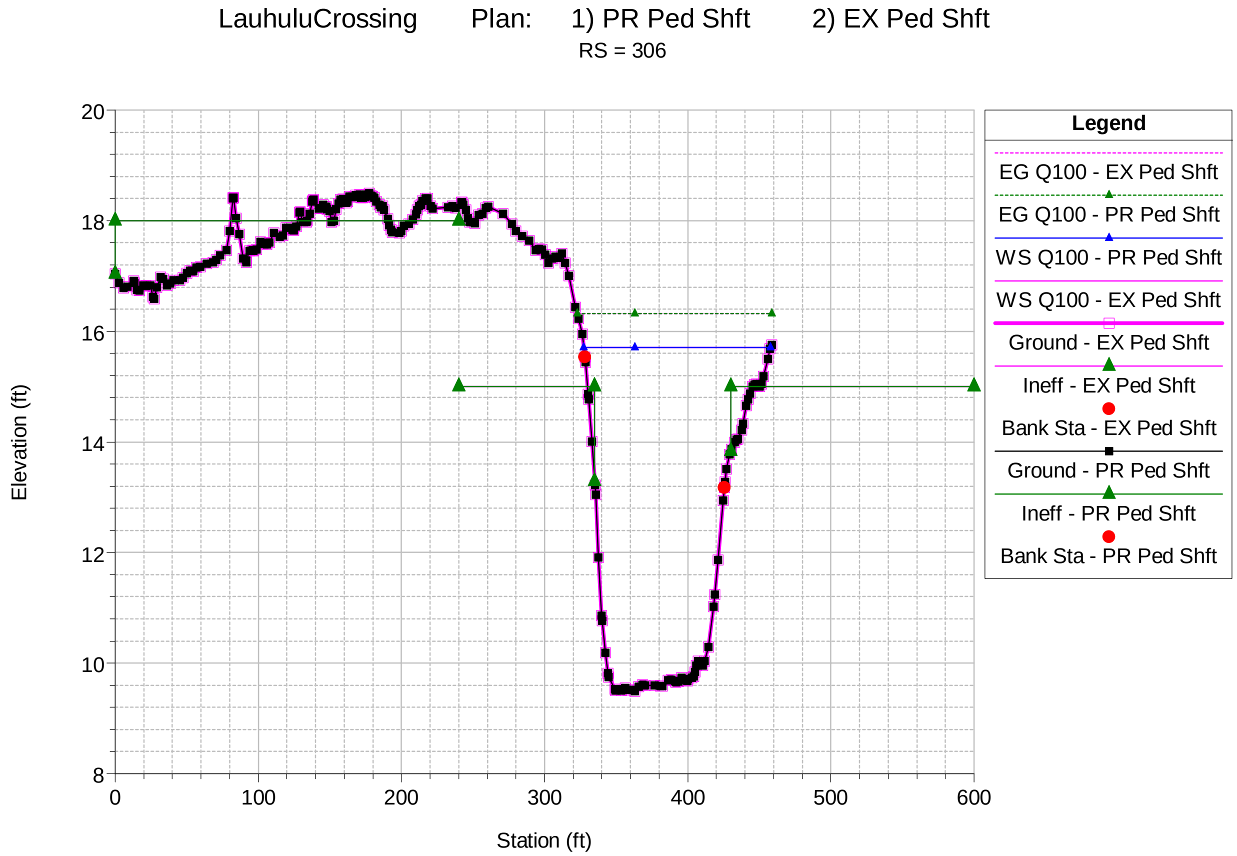

LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 370
Elevation (ft)
Station (ft)
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft

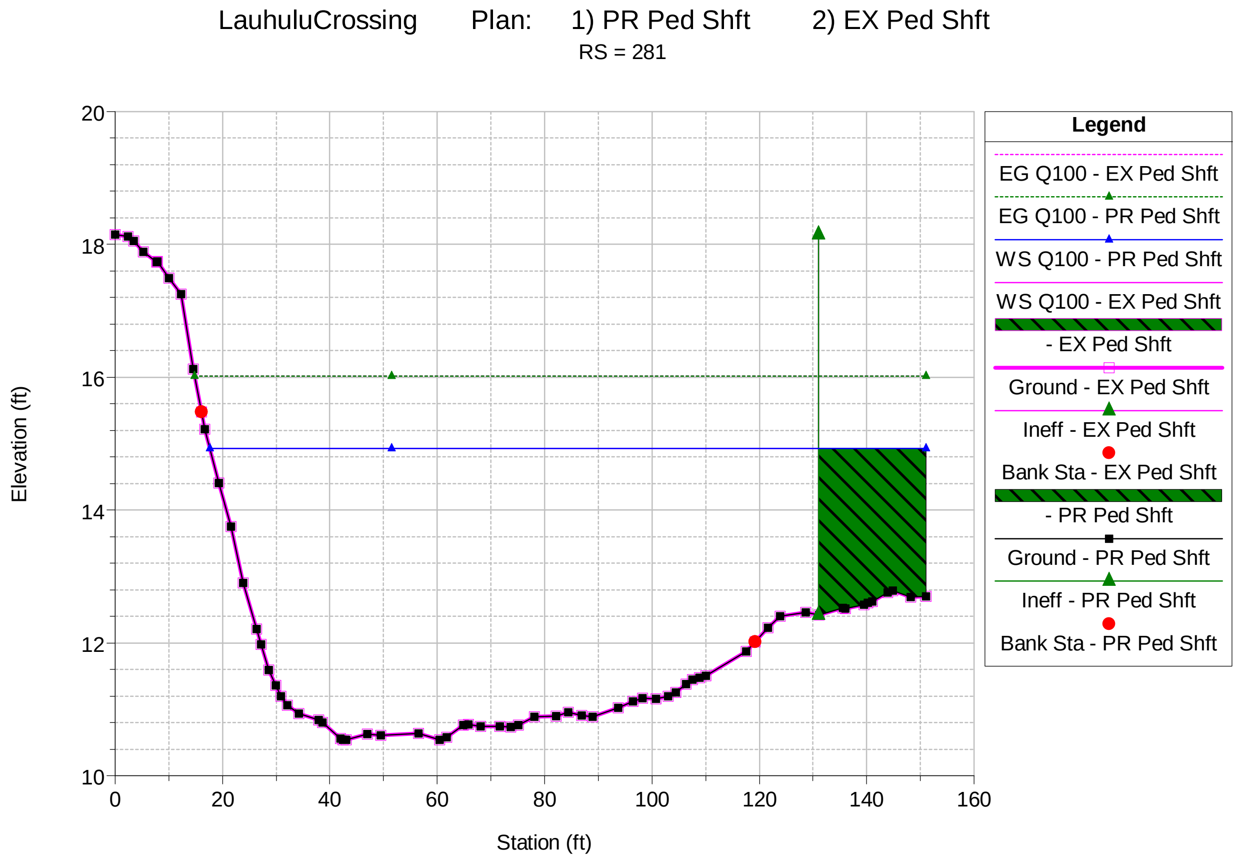
LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 350 BR



LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 350 BR




LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 306
Elevation (ft)
Station (ft)
20
18
16
14
12
10
8
0
100
200
300
400
500
600
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft


LauhuluCrossing Plan: 1) PR Ped Shft 2) EX Ped Shft
RS = 281
Elevation (ft)
Station (ft)
20
18
16
14
12
10
0
20
40
60
80
100
120
140
160
Legend
EG Q100 - EX Ped Shft
EG Q100 - PR Ped Shft
WS Q100 - PR Ped Shft
WS Q100 - EX Ped Shft
- EX Ped Shft
Ground - EX Ped Shft
Ineff - EX Ped Shft
Bank Sta - EX Ped Shft
- PR Ped Shft
Ground - PR Ped Shft
Ineff - PR Ped Shft
Bank Sta - PR Ped Shft

Appendix

G

Preliminary Drainage Report

TECHNICAL REPORT

Kamehameha Highway Pedestrian Safety Project
Vicinity of Laniakea Beach
Preliminary Drainage Report

Haleiwa, Island of Oahu, Hawaii

April 2021

Prepared for:
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

wsp

Table of Contents

APPENDICES

Appendix Title

APPENDIX A Calculation Summary Tables

APPENDIX B Existing Hydrology Exhibit

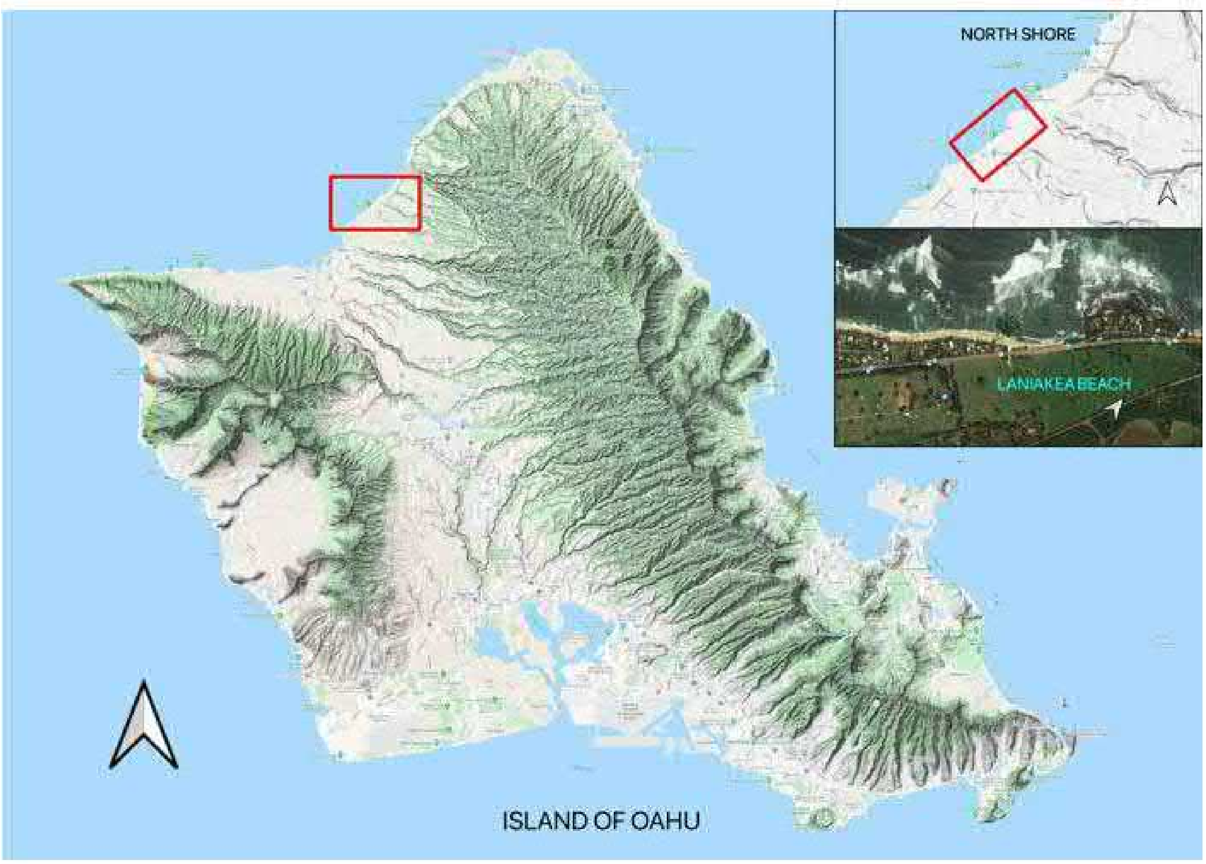
APPENDIX C Proposed Hydrology Exhibits

1 INTRODUCTION

1.1 PROJECT LOCATION AND DESCRIPTION

The proposed project, identified as the Kamehameha Highway Pedestrian Safety Project, will be discharging stormwater to two outfalls locations. One located on the Hale'iwa side of the Lauhulu Stream Watershed (also referred to as Laniakea Stream) to the west and another one to the Kawailoa Stream watershed to the east. The proposed stormwater drainage system will collect and convey the onsite runoff along the highway towards a system of ditches and swales to collect and convey offsite runoff and discharge it to Lauhulu Stream. Figure 1 provides the Project Location Map.

Figure 1-1. Project Location Map



The Kamehameha Highway Pedestrian Safety Project will realign Kamehameha Highway inland approximately 80 feet mauka from its furthest point to the existing highway. Guardrails on the mauka side of highway will discourage vehicles parking on the mauka side of the highway, thereby reducing pedestrian and vehicular conflicts.

The project includes the following facilities:

- Realigned Kamehameha Highway,
- One new bridge at Lauhulu Stream.
- Existing bridge at Lauhulu Stream will remain for pedestrian and bicycling use.
- Portions of the existing highway will remain for pedestrian and bicycling use.
- Permanent BMP consisting of grass swale and landscaping between the pedestrian and bicycling path and realigned highway.

1.2 REPORT PURPOSE

The drainage report provides calculations for the amount of stormwater runoff generated by the subdivided drainage areas along the proposed development areas. It provides the peak flows based on the 10-year, 25-year, 50-year, and 100-year storm events.

In summary, this report includes the hydrologic analysis of the following:

- The pre and post-development hydrologic conditions and 10-year, 25-year, 50-year, and 100-year peak stormwater runoff rates using the Rational Method, and
- The design of drainage features using the 50-year storm event.

2 EXISTING DRAINAGE SETTING AND FACILITIES

2.1 DRAINAGE SETTING

The current Kamehameha Highway, in the vicinity of Laniakea Beach, is located in the Keamanea Watershed which was subdivided into three sub-basins. The first sub-basin encompasses the Kawailoa Stream with an area of 2.1 acres and drains along Ashley Road through an existing arch culvert. The second sub-basin drains an area of 51 acres towards the start of Pohaku Loa Way. The third sub-basin is part of the Lauhulu Stream and drains 352 acres towards an existing Lauhulu Bridge on the Hale'iwa side of Laniakea Beach.

2.1.1 CLIMATE

The United States Department of Agriculture (USDA) Web Soil Survey tool was used to understand the climate conditions for the project area. The mean annual precipitation around the project is 59.9 inches/hour. The susceptibility of the soil to sheet and rill erosion by water was rated between 0.17 to 0.28. The estimates are based primarily on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of Ksat range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Surface runoff is rated from low to medium.

2.1.2 LAND USE AND SOILS

The USDA Web Soil Survey tool was used to run various soil data reports showing soil characterization on Oahu. The hydrologic soil group for the site is classified as rating C, Waialua silty clay, with 0 to 3 percent slopes, and slow infiltration rate. Offsite drainage areas were classified with HSG B, and moderate infiltration rate.

2.1.3 GROUNDWATER

The island of Oahu has been divided into seven major ground-water areas that are delineated by deep-seated structural geohydrologic barriers. The project is located in the groundwater North Central Oahu area, which contains a basal lens of freshwater with some confinement along the coast, is bound on the east by the Ko`olau rift zone, on the south by the north Schofield ground-water barrier, on the west by the Waianae rift zone, and on the north by the sea.

2.1.4 FLOODPLAIN

The area is located within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 15003C0362G, and is categorized as *Area with high flood risk due to levee; Zone D.* The area within the limits of the project are Zones AE, VE on the Haleʻiwa side of the Lauhulu Stream bridge and Zone X to the Waimea side of Ashley Road

The applicable flood zones are defined as follows:

- Zone AE and VE: Area subject to inundation by the 1 percent annual chance (100-year) flood event. Base-flood elevations have been determined by FEMA
- Zone D: Area with flood risk due to levee.
- Zone X (unshaded): Area determined to be outside the 0.2 percent annual chance (500-year) floodplain.

2.2 EXISTING DRAINAGE FACILITIES

2.2.1 SURFACE DRAINAGE

The Kamehameha Highway existing hydrology was analyzed by subdividing the 0.4 miles of the considered segment of the roadway into smaller drainage areas using the crown of the roadway as a breaking point. An area east of the existing arch culvert by Ashley Road is impacted by 8.1 acres of offsite runoff. The roadway is flat with no drainage features on either side of the roadway. Another area being impacted by 22.3 acres of offsite runoff is located west of the existing arch culvert by Ashley Road, there are no drainage features along the road. The westbound side of the road starts sloping to a small degree mauka around Pohaku Loa Way. The roadway is impacted by 17.2 acres of offsite runoff. An area west of the Lauhulu Stream receives 2.25 acres of offsite runoff. Most of the runoff impacting the 0.4 miles of highway sheet flows towards Laniakea Beach or dissipates through some available slope shoulders around the existing bridge.

3 METHODOLOGY

The Project hydrologic, hydraulic, and storm drain design criteria follows the Hawaii Department of Transportation (HDOT) Highway Division Design Criteria for Highway Drainage summarized below. The primary goal of the analysis is to provide pre and post-development peaks flow for the 10-year, 25-year, 50-year, and 100-year event flow. The design recurrence interval selected in the analysis of existing and proposed drainage features follows the Hawaii Design Criteria for Highway Drainage. The drainage features shall be designed to convey the 50-year event flow.

The Federal Highway Administration (FHWA), Hydraulic Engineering Circular No. 22 (HEC-22), Urban Drainage Design Manual was used for runoff calculations. The Rational Method was selected as used, given as:

$$Q = (CIA)/Ku$$

where:

Q = Flow, cubic feet per second (cfs)

C = Dimensionless runoff coefficient, was determined as a function of the ground cover and a host of other hydrologic abstractions using equation $C = \Sigma (C_x A_x)/A_{total}$. It relates the estimated peak discharge to a theoretical maximum of 100% runoff. Values for C were based on Table 3.1 of the FHWA HEC-22 manual. In general:

Road C value = 0.95; Silty-clay soils with 0 to 3% slopes C value = 0.20.

I = Intensity o rainfall in inches per hour as determined by time of concentration (T_c). Rainfall intensity, duration, and frequency curves were available from the National Oceanic Atmospheric Administration (NOAA).

A = Drainage area, hectares, ha (acres)

Ku = Units conversion factor equal to 1.0 in English Units

Tc= Time required for water to flow from the most remote part of the drainage area to the outlet point under consideration. The minimum Tc shall be 10 minutes. The time of concentration was calculated as the sum of the travel times within the various consecutive flow segments.

Sheet flow is the shallow mass of runoff on a planar surface with a uniform depth across the sloping surface. This usually occurs at the headwater of streams over relatively short distances, rarely more than about 400 ft, and possibly less than 80 ft. Sheet flow is commonly estimated with a version of the kinematic wave equation, a derivative of Manning's equation, as follows:

$$T_{ti} = (K_u/I^{0.4})(nL/\sqrt{S})^{0.6}$$

where:

T_{ti} = Sheet flow travel time, min

n = Roughness coefficient, concrete 0.013; grasses 0.20.

L = Flow length, ft

I = Rainfall intensity, in/hr

S = Surface slope, ft/ft

K_u = Empirical coefficient equal to 0.933

Shallow Concentrated Flow Velocity. After short distances of at most 400 ft, sheet flow tends to concentrate in rills and then gullies of increasing proportions. Such flow is usually referred to as shallow concentrated flow. The velocity of such flow can be estimated using a relationship between velocity and slope as follows:

$$V = K_u\, k\, Sp^{0.5}$$

where:

K_u = 3.28 in
V = Velocity, feet per second (fps)
k = Intercept coefficient. Paved area 0.619; Unpaved 0.491; Grassed waterway 0.457;
Short grass pasture 0.213
S_p = Slope, percent

Open Channel and Pipe Velocity. Flow in gullies empties into channels or pipes. Open channels are assumed to begin where either the blue streamline shows on United States Geological Survey (USGS) quadrangle sheets or the channel is visible on aerial photographs. Cross-section geometry and roughness should be obtained for all channel reaches in the watershed. Manning's equation can be used to estimate average flow velocities in pipes and open channels as follows:

$$V = (K_u/n)\, R^{2/3}\, S^{1/2}$$

where:

n = Roughness coefficient

V = Velocity, fps

R = Hydraulic radius (defined as the flow area divided by the wetted perimeter), ft

S = Slope, ft/ft

Ku = Units conversion factor equal to 1.49

The Bentley Flow-Master application was used to calculate the channel flow velocity within the undeveloped vegetated areas on the project. The travel time is then calculated as follows:

$$T_{ti} = L / (60 V)$$

where:

T_{ti} = Travel time for Segment I, min

L = Flow length for Segment I, ft

V = Velocity for Segment I, fps

Assumptions inherent in the Rational formula are as follows:

• Peak flow occurs when the entire watershed is contributing to the flow.

• Rainfall intensity is the same over the entire drainage area.

• Rainfall intensity is uniform over a time duration equal to the time of concentration, t_c. The time of concentration is the time required for water to travel from the hydraulically most remote point of the basin to the point of interest.

• Frequency of the computed peak flow is the same as that of the rainfall intensity, i.e., the 10-year rainfall intensity is assumed to produce the 10-year peak flow.

• The coefficient of runoff is the same for all storms of all recurrence probabilities.

3.1 ANALYSIS RESULTS

The following tables show the peak flow results for the 0.4 miles of Kamehameha Highway in the vicinity of Laniakea Beach.

Table 1 Existing Peak Flows

Existing Peak Flows (cfs)			
10- year	25-year	50-year	100-year
53.2	66.0	75.6	82.4

The proposed peak flows are as follows:

Table 2 Proposed Peak Flows

Proposed Peak Flows (cfs)			
10- year	25-year	50-year	100-year
20.6	24.9	28.2	31.6

In addition, the 50-year Peak flow was selected to analyze and design the drainage features for the project. The offsite drainage will convey flows towards a system of ditches/berms. The analyzed proposed peak flows are as follows:

Table 3 Offsite Proposed Peak Flow

Offsite Proposed Peak Flows (cfs)
50-year
41.7

4 PROPOSED DRAINAGE SYSTEM RECOMMENDATIONS

4.1 PEDESTRIAN SAFETY ALIGNMENT

The Kamehama Highway Pedestrian Safety alignment will be designed with the highway tilted (reverse crown) towards vegetated swales located between the realigned highway and the pedestrian and bicycle path to provide water quality treatment. Some cross culverts will be required to convey roadway and offsite runoff. The hydrology and hydraulic calculation summary tables are provided in Appendix A. The proposed hydrology exhibit is provided in Appendix B.

APPENDIX

A CALCULATION SUMMARY TABLES

Existing 10 yr

DMA	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Pervious	Min Tc (min)	Sheet Flow Length(ft)	Shallow Flow Length(ft)	Channelized Flow Length (ft)	10 min. Rainfall Intensity, in/hr.	Shallow Surface Slope (%)	Sheet Flow K_u	Shallow Flow K_u	Roughness Coefficient, n	Sheet Flow Travel Time, T_{ti} (min)	Shallow Velocity (ft/s)	Shallow Flow Travel Time (min)	Channelized Velocity, ft/s	Channelized Tc (min)	Total Tc (min)	Rainfall Intensity (in/hr)	10-yr Q (cfs)
A-1		8.06		0.20		400	400	36	6.24	3.75	0.933	3.28	0.24	16.13	1.35	4.93	6.97	0.09	21.15	4.59	7.40
A-2	0.15		0.95						6.24											6.24	0.87
B	0.15		0.95						6.24											6.24	0.87
C-1									6.24												
C-2	0.05		0.95						6.24											6.24	0.29
D	0.05		0.95						6.24											6.24	0.29
E	0.32		0.95						6.24											6.24	1.88
F-1		11.28		0.20		400	400	49	6.24	9.3	0.933	3.28	0.24	14.29	2.13	3.13	6.97	0.12	17.53	4.96	11.19
F-2	0.32		0.95						6.24											6.24	1.88
G-1		51.84							6.24												
G-2	0.02		0.95						6.24											6.24	0.12
H	0.02		0.95						6.24											6.24	0.12
I-1		17.15	0.95	0.20		400	400	250	6.24	9.3	0.933	3.28	0.24	14.29	2.13	3.13	6.97	0.60	18.01	4.91	16.84
I-2	0.42		0.95						6.24											6.24	2.46
J	0.69		0.95						6.24											6.24	4.10
K-1									6.24												
K-2	0.05		0.95						6.24											6.24	0.30
L	0.05		0.95						6.24											6.24	0.30
M-1		2.25		0.20		400	400	250	6.24	10	0.933	3.28	0.24	13.84	2.21	3.02	6.97	0.60	17.46	4.97	2.24
M-2	0.17		0.95						6.24											6.24	1.03
N	0.17		0.95						6.24											6.24	1.03
																					53.19

Existing 25 yr

DMA	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Pervious	Min Tc (min)	Sheet Flow Length(ft)	Shallow Flow Length(ft)	Channelized Flow Length (ft)	10 min. Rainfall Intensity, in/hr.	Shallow Surface Slope (%)	Sheet Flow K_u	Shallow Flow K_u	Roughness Coefficient, n	Sheet Flow Travel Time, T_{ti} (min)	Shallow Velocity (ft/s)	Shallow Flow Travel Time (min)	Channelized Velocity, ft/s	Channelized Tc (min)	Total Tc (min)	Rainfall Intensity (in/hr)	25-yr Q (cfs)
A-1	0	8.06		0.20		400	400	36	7.54	10	0.933	3.28	0.24	12.83	2.21	3.02	6.97	0.09	15.94	6.19	9.98
A-2	0.15		0.95						7.54											7.54	1.05
B	0.15		0.95						7.54											7.54	1.05
C-1	0								7.54												
C-2	0.05		0.95						7.54											7.54	0.35
D	0.05		0.95						7.54											7.54	0.35
E	0.32		0.95						7.54											7.54	2.27
F-1	0	11.28		0.20		400	400	49	7.54	9.3	0.933	3.28	0.24	13.24	2.13	3.13	6.97	0.12	16.49	6.12	13.80
F-2	0.32		0.95						7.54											7.54	2.27
G-1	0	51.84							7.54												
G-2	0.02		0.95						7.54											7.54	0.14
H	0.02		0.95						7.54											7.54	0.14
I-1	0	17.15	0.95	0.20		400	400	250	7.54	9.3	0.933	3.28	0.24	13.24	2.13	3.13	6.97	0.60	16.97	6.06	20.79
I-2	0.42		0.95						7.54											7.54	2.97
J	0.69		0.95						7.54											7.54	4.96
K-1	0								7.54												
K-2	0.05		0.95						7.54											7.54	0.36
L	0.05		0.95	0.20					7.54											7.54	0.36
M-1	0	2.25		0.20		400	400	250	7.54	10	0.933	3.28	0.24	12.83	2.21	3.02	6.97	0.60	16.45	6.00	2.70
M-2	0.17		0.95						7.54											7.54	1.24
N	0.17		0.95						7.54											7.54	1.24
																					66.03

Existing 50 yr																					
DMA	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Pervious	Min Tc (min)	Sheet Flow Length(ft)	Shallow Flow Length(ft)	Channelized Flow Length (ft)	Rainfall Intensity, in/hr.	Shallow Surface Slope (%)	Sheet Flow K_u	Shallow Flow K_u	Roughness Coefficient, n	Sheet Flow Travel Time,T_{ti} (min)	Shallow Velocity (ft/s)	Shallow Flow Travel Time (min)	Channelized Velocity, ft/s	Channelized Tc (min)	Total Tc (min)	Rainfall Intensity (in/hr)	50-yr Q (cfs)
A-1	0	8.06		0.20		400	400	36	8.54	10	0.933	3.28	0.24	12.21	2.21	3.02	6.97	0.09	15.31	7.11	11.46
A-2	0.15		0.95						8.54											8.54	1.19
B	0.15		0.95						8.54											8.54	1.19
C-1	0								8.54												
C-2	0.05		0.95						8.54											8.54	0.39
D	0.05		0.95						8.54											8.54	0.39
E	0.32		0.95						8.54											8.54	2.57
F-1	0	11.28		0.20		400	400	49	8.54	9.3	0.933	3.28	0.24	12.60	2.13	3.13	6.97	0.12	15.85	7.03	15.86
F-2	0.32		0.95						8.54											8.54	2.57
G-1	0	51.84							8.54												
G-2	0.02		0.95						8.54											8.54	0.16
H	0.02		0.95						8.54											8.54	0.16
I-1	0	17.15	0.95	0.20		400	400	250	8.54	9.3	0.933	3.28	0.24	12.60	2.13	3.13	6.97	0.60	16.33	6.96	23.88
I-2	0.42		0.95						8.54											8.54	3.37
J	0.69		0.95						8.54											8.54	5.61
K-1	0								8.54												
K-2	0.05		0.95						8.54											8.54	0.41
L	0.05		0.95	0.20					8.54											8.54	0.41
M-1	0	2.25		0.20		400	400	250	8.54	10	0.933	3.28	0.24	12.60	2.21	3.02	6.97	0.60	16.22	6.98	3.14
M-2	0.17		0.95						8.54											8.54	1.41
N	0.17		0.95						8.54											8.54	1.41
																					75.58

Existing 100 yr																					
DMA	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Pervious	Min Tc (min)	Sheet Flow Length(ft)	Shallow Flow Length(ft)	Channelized Flow Length (ft)	Rainfall Intensity, in/hr.	Shallow Surface Slope (%)	Sheet Flow K_u	Shallow Flow K_u	Roughness Coefficient, n	Sheet Flow Travel Time,T_{ti} (min)	Shallow Velocity (ft/s)	Shallow Flow Travel Time (min)	Channelized Velocity, ft/s	Channelized Tc (min)	Total Tc (min)	Rainfall Intensity (in/hr)	50-yr Q (cfs)
A-1	0	8.06		0.20		400	400	36	9.56	10	0.933	3.28	0.24	11.67	2.21	3.02	6.97	0.09	14.77	8.10	13.06
A-2	0.15		0.95						9.56											9.56	1.33
B	0.15		0.95						9.56											9.56	1.33
C-1	0								9.56												
C-2	0.05		0.95						9.56											9.56	0.44
D	0.05		0.95						9.56											9.56	0.44
E	0.32		0.95						9.56											9.56	2.88
F-1	0	11.28		0.20		400	400	49	9.56	9.3	0.933	3.28	0.24	12.04	2.13	3.13	6.97	0.12	15.29	7.95	17.93
F-2	0.32		0.95						9.56											9.56	2.88
G-1	0	51.84							9.56												
G-2	0.02		0.95						9.56											9.56	0.18
H	0.02		0.95						9.56											9.56	0.18
I-1	0	17.15	0.95	0.20		400	400	250	9.56	9.3	0.933	3.28	0.24	12.04	2.13	3.13	6.97	0.60	15.77	7.03	24.12
I-2	0.42		0.95						9.56											9.56	3.77
J	0.69		0.95						9.56											9.56	6.28
K-1	0								9.56												
K-2	0.05		0.95						9.56											9.56	0.45
L	0.05		0.95	0.20					9.56											9.56	0.45
M-1	0	2.25		0.20		400	400	250	9.56	10	0.933	3.28	0.24	12.04	2.21	3.02	6.97	0.60	15.66	7.90	3.56
M-2	0.17		0.95						9.56											9.56	1.57
N	0.17		0.95						9.56											9.56	1.57
																					82.44

Proposed -10yr																				
DMA	Total Area	Area, Impervious (ac)	Area, Pervious (ac)	C, Impervious	C, Pervious	Weighted C	Min Tc (min)	Sheet Flow Length(ft)	Channelized Flow Length (ft)	10 minute Tc Rainfall Intensity, in/hr.	Sheet Surface Slope (ft/ft)	Sheet Flow K_u	Roughness Coefficient, n	**Sheet Flow Travel Time,T_{ti} (min)**	Channelized Velocity, ft/s	**Channelized Tc (min)**	**Total Tc (min)**	**Design Tc (min)**	**Design Intensity (in/hr)**	**10-yr Q (cfs)**
1	0.82	0.66	0.16	0.95	0.20	0.80	10	44	700	6.24	0.02	0.933	0.013	1.04	2.20	5.30	6.34	10	6.24	4.14
2	2.37	1.91	0.46	0.95	0.20	0.80	10	44	700	6.24	0.02	0.933	0.013	1.04	3.20	3.65	4.68	10	6.24	11.89
3	1.01	0.72	0.29	0.95	0.20	0.73	10	44	700	6.24	0.02	0.933	0.013	1.04	2.18	5.35	6.39	10	6.24	4.61
																				20.64

Proposed -25yr																				
DMA	Total Area	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Impervious	Weighted C	Min Tc (min)	Sheet Flow Length(ft)	Channelized Flow Length (ft)	Rainfall Intensity, in/hr.	Sheet Surface Slope (ft/ft)	Sheet Flow K_u	Roughness Coefficient, n	**Sheet Flow Travel Time,T_{ti} (min)**	Channelized Velocity, ft/s	**Channelized Tc (min)**	**Total Tc (min)**	**Design Tc (min)**	**Design Intensity (in/hr)**	**25-yr Q (cfs)**
1	0.82	0.66	0.16	0.95	0.20	0.80	10	44	700	7.54	0.02	0.933	0.013	0.96	2.20	5.30	6.26	10	7.54	5.00
2	2.37	1.91	0.46	0.95	0.20	0.80	10	44	700	7.54	0.02	0.933	0.013	0.96	3.20	3.65	4.61	10	7.54	14.36
3	1.01	0.72	0.29	0.95	0.20	0.73	10	44	700	7.54	0.02	0.933	0.013	0.96	2.18	5.35	6.31	10	7.54	5.58
																				24.94

Proposed -50yr																				
DMA	Total Area	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Impervious	Weighted C	Min Tc (min)	Sheet Flow Length(ft)	Channelized Flow Length (ft)	Rainfall Intensity, in/hr.	Sheet Surface Slope (ft/ft)	Sheet Flow K_u	Roughness Coefficient, n	**Sheet Flow Travel Time,T_{ti} (min)**	Channelized Velocity, ft/s	**Channelized Tc (min)**	**Total Tc (min)**	**Design Tc (min)**	**Design Intensity (in/hr)**	**50-yr Q (cfs)**
1	0.82	0.66	0.16	0.95	0.20	0.80	10	44	700	8.54	0.02	0.933	0.013	0.92	2.20	5.30	6.22	10	8.54	5.66
2	2.37	1.91	0.46	0.95	0.20	0.80	10	44	700	8.54	0.02	0.933	0.013	0.92	3.20	3.65	4.56	10	8.54	16.27
3	1.01	0.72	0.29	0.95	0.20	0.73	10	44	700	8.54	0.02	0.933	0.013	0.92	2.18	5.35	6.27	10	8.54	6.32
																				28.25

Proposed -100yr																				
DMA	Total Area	AREA, Impervious (ac)	Area, Pervious (ac)	C	C, Impervious	Weighted C	Min Tc (min)	Sheet Flow Length(ft)	Channelized Flow Length (ft)	Rainfall Intensity, in/hr.	Sheet Surface Slope (ft/ft)	Sheet Flow K_u	Roughness Coefficient, n	**Sheet Flow Travel Time,T_{ti} (min)**	Channelized Velocity, ft/s	**Channelized Tc (min)**	**Total Tc (min)**	**Design Tc (min)**	**Design Intensity (in/hr)**	**100-yr Q (cfs)**
1	0.82	0.66	0.16	0.95	0.20	0.80	10	44	700	9.56	0.02	0.933	0.013	0.87	2.20	5.30	6.18	10	9.56	6.34
2	2.37	1.91	0.46	0.95	0.20	0.80	10	44	700	9.56	0.02	0.933	0.013	0.87	3.20	3.65	4.52	10	9.56	18.21
3	1.01	0.72	0.29	0.95	0.20	0.73	10	44	700	9.56	0.02	0.933	0.013	0.87	2.18	5.35	6.23	10	9.56	7.07
																				31.62

Offsite Drainage - 50 year

Offisite Drainage																						
DMA	Total Area (ac)	Pervious Area (ac)	C	Min Tc (min)	Sheet Flow Length(ft)	Shallow Flow Length(ft)	Channelized Flow Length (ft)	10 minute Rainfall Intensity, in/hr.	Shallow Surface Slope (%)	Sheet Flow K_u	Shallow Flow K_u	Sheet Flow Roughness Coefficient, n	**Sheet Flow Travel Time,T_{ti} (min)**	Shallow Velocity (ft/s)	**Shallow Flow Travel Time (min)**	Channelized Velocity, ft/s	**Channelized Tc (min)**	**Total Tc (min)**	**Design Tc (min)**	**Design Intensity (in/hr)**	**50-yr Q (cfs)**	**Normal Depth Ditch Berm**
DA-1-A	26	26.00	0.20	10	400	400	364	8.54	3.75	0.933	3.28	0.24	14.23	2.20	3.03	6.97	0.87	18.13	18.13	6.73	35.00	1.1
DA-2-B	3.9	3.90	0.20	10	400	200	18	8.54	9	0.933	3.28	0.24	6.67	2.20	1.52	7.97	0.04	8.22	10	8.54	6.66	0.6
																					41.66	

NOAA Atlas 14, Volume 4, Version 3
Location name: Haleiwa, Hawaii, USA*
Latitude: 21.6217°, Longitude: -158.0815°
Elevation: 17.42 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

S. Perica, D. Martin, B. Lin, T. Parzybok, D. Riley, M. Yekta, L. Hiner, L.-C. Chen, D. Brewer, F. Yan, K. Maitaria, C. Trypaluk, G. M. Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.10 (3.62-4.67)	5.47 (4.85-6.31)	7.13 (6.34-8.20)	8.41 (7.43-9.71)	10.2 (8.83-11.8)	11.5 (9.84-13.4)	12.9 (10.8-15.1)	14.3 (11.6-16.8)	16.2 (12.6-19.3)	17.6 (13.3-21.3)
10-min	3.05 (2.69-3.46)	4.06 (3.59-4.68)	5.29 (4.70-6.07)	6.24 (5.50-7.19)	7.54 (6.55-8.72)	8.54 (7.29-9.94)	9.56 (7.99-11.2)	10.6 (8.62-12.5)	12.0 (9.35-14.3)	13.1 (9.84-15.8)
15-min	2.55 (2.25-2.90)	3.40 (3.01-3.92)	4.42 (3.93-5.08)	5.22 (4.61-6.02)	6.31 (5.48-7.30)	7.15 (6.10-8.32)	8.00 (6.68-9.36)	8.87 (7.22-10.5)	10.0 (7.83-12.0)	11.0 (8.24-13.2)
30-min	1.80 (1.58-2.04)	2.39 (2.12-2.76)	3.11 (2.77-3.58)	3.68 (3.24-4.24)	4.44 (3.86-5.14)	5.03 (4.30-5.85)	5.63 (4.70-6.59)	6.24 (5.08-7.36)	7.06 (5.51-8.42)	7.71 (5.80-9.28)
60-min	1.18 (1.04-1.34)	1.57 (1.39-1.81)	2.05 (1.82-2.35)	2.42 (2.13-2.79)	2.92 (2.54-3.38)	3.31 (2.83-3.85)	3.71 (3.10-4.34)	4.11 (3.34-4.84)	4.65 (3.62-5.54)	5.07 (3.81-6.11)
2-hr	0.815 (0.714-0.932)	1.10 (0.972-1.27)	1.44 (1.27-1.65)	1.70 (1.50-1.96)	2.06 (1.78-2.38)	2.34 (1.99-2.72)	2.61 (2.18-3.07)	2.90 (2.36-3.43)	3.29 (2.57-3.94)	3.59 (2.70-4.35)
3-hr	0.614 (0.536-0.706)	0.847 (0.753-0.976)	1.11 (0.987-1.27)	1.31 (1.16-1.51)	1.59 (1.38-1.84)	1.80 (1.54-2.10)	2.02 (1.69-2.36)	2.24 (1.82-2.64)	2.53 (1.98-3.02)	2.76 (2.08-3.33)
6-hr	0.399 (0.347-0.459)	0.538 (0.477-0.621)	0.712 (0.631-0.818)	0.846 (0.743-0.970)	1.02 (0.887-1.18)	1.16 (0.989-1.34)	1.30 (1.08-1.51)	1.43 (1.17-1.69)	1.62 (1.26-1.93)	1.76 (1.32-2.12)
12-hr	0.240 (0.206-0.277)	0.328 (0.290-0.377)	0.443 (0.393-0.509)	0.534 (0.469-0.614)	0.656 (0.568-0.758)	0.750 (0.639-0.871)	0.845 (0.704-0.988)	0.942 (0.765-1.11)	1.07 (0.835-1.28)	1.17 (0.881-1.41)
24-hr	0.140 (0.121-0.161)	0.195 (0.169-0.224)	0.270 (0.234-0.312)	0.330 (0.284-0.382)	0.411 (0.352-0.479)	0.475 (0.404-0.556)	0.541 (0.457-0.637)	0.610 (0.511-0.722)	0.704 (0.582-0.841)	0.778 (0.636-0.937)
2-day	0.081 (0.070-0.093)	0.112 (0.097-0.128)	0.153 (0.132-0.176)	0.185 (0.160-0.213)	0.228 (0.196-0.264)	0.261 (0.223-0.304)	0.294 (0.250-0.344)	0.329 (0.277-0.387)	0.374 (0.312-0.444)	0.410 (0.337-0.490)
3-day	0.059 (0.052-0.068)	0.081 (0.071-0.093)	0.110 (0.096-0.127)	0.133 (0.115-0.153)	0.162 (0.140-0.187)	0.184 (0.158-0.214)	0.207 (0.176-0.241)	0.229 (0.194-0.269)	0.259 (0.216-0.306)	0.282 (0.233-0.336)
4-day	0.049 (0.042-0.055)	0.066 (0.058-0.075)	0.089 (0.078-0.102)	0.106 (0.093-0.122)	0.129 (0.112-0.149)	0.146 (0.126-0.169)	0.163 (0.139-0.189)	0.180 (0.152-0.210)	0.202 (0.169-0.237)	0.218 (0.181-0.259)
7-day	0.032 (0.028-0.036)	0.043 (0.038-0.049)	0.057 (0.050-0.065)	0.068 (0.059-0.078)	0.082 (0.071-0.094)	0.092 (0.079-0.106)	0.102 (0.087-0.118)	0.112 (0.095-0.130)	0.124 (0.104-0.146)	0.134 (0.111-0.158)
10-day	0.025 (0.022-0.028)	0.033 (0.029-0.038)	0.044 (0.039-0.051)	0.052 (0.045-0.060)	0.062 (0.054-0.072)	0.070 (0.060-0.081)	0.077 (0.066-0.090)	0.084 (0.072-0.098)	0.093 (0.078-0.110)	0.100 (0.083-0.118)
20-day	0.016 (0.014-0.018)	0.021 (0.019-0.024)	0.028 (0.024-0.032)	0.033 (0.028-0.037)	0.039 (0.033-0.044)	0.043 (0.037-0.050)	0.047 (0.040-0.055)	0.051 (0.043-0.060)	0.056 (0.047-0.066)	0.059 (0.049-0.070)
30-day	0.012 (0.011-0.014)	0.016 (0.014-0.019)	0.021 (0.019-0.024)	0.025 (0.022-0.029)	0.029 (0.026-0.034)	0.033 (0.028-0.038)	0.036 (0.031-0.042)	0.039 (0.033-0.046)	0.043 (0.036-0.051)	0.046 (0.038-0.054)
45-day	0.010 (0.009-0.011)	0.013 (0.011-0.015)	0.017 (0.015-0.019)	0.020 (0.017-0.023)	0.023 (0.020-0.027)	0.026 (0.022-0.030)	0.028 (0.024-0.033)	0.031 (0.026-0.036)	0.034 (0.028-0.040)	0.036 (0.030-0.042)
60-day	0.009 (0.008-0.010)	0.011 (0.010-0.013)	0.015 (0.013-0.017)	0.017 (0.015-0.019)	0.020 (0.017-0.023)	0.022 (0.019-0.025)	0.024 (0.021-0.028)	0.026 (0.022-0.030)	0.028 (0.024-0.033)	0.030 (0.025-0.036)

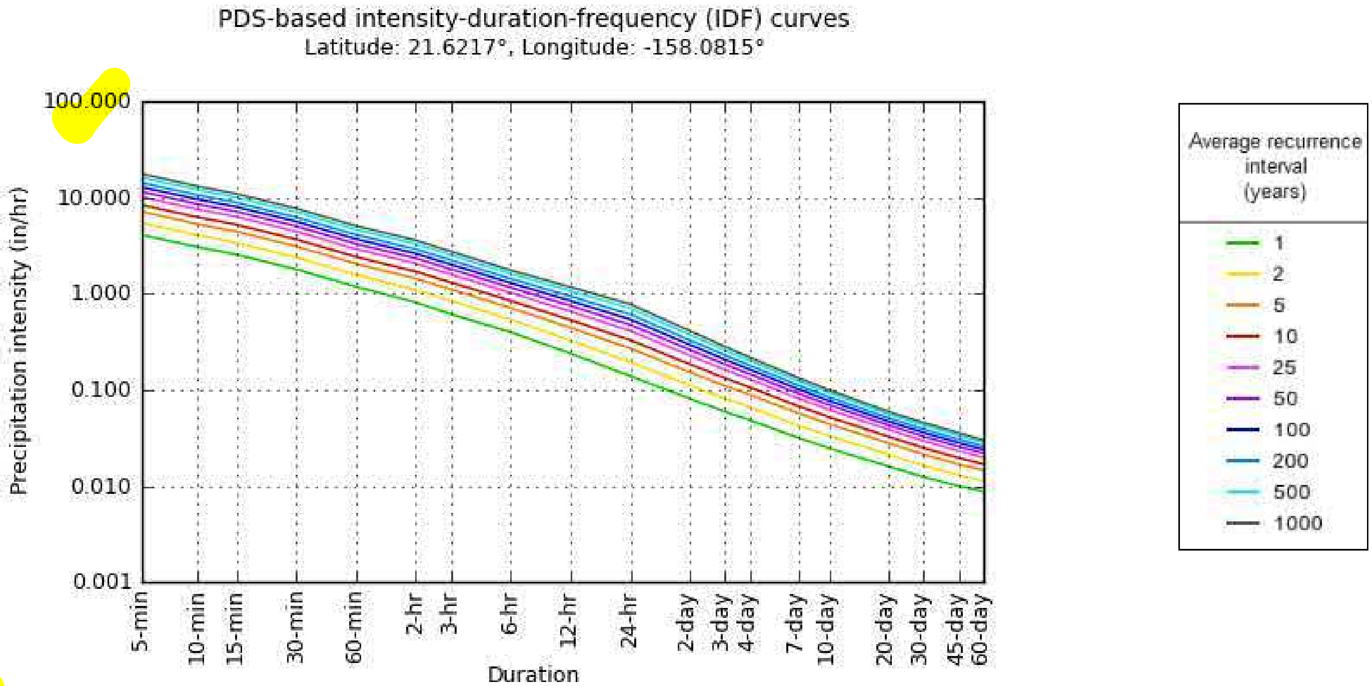
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

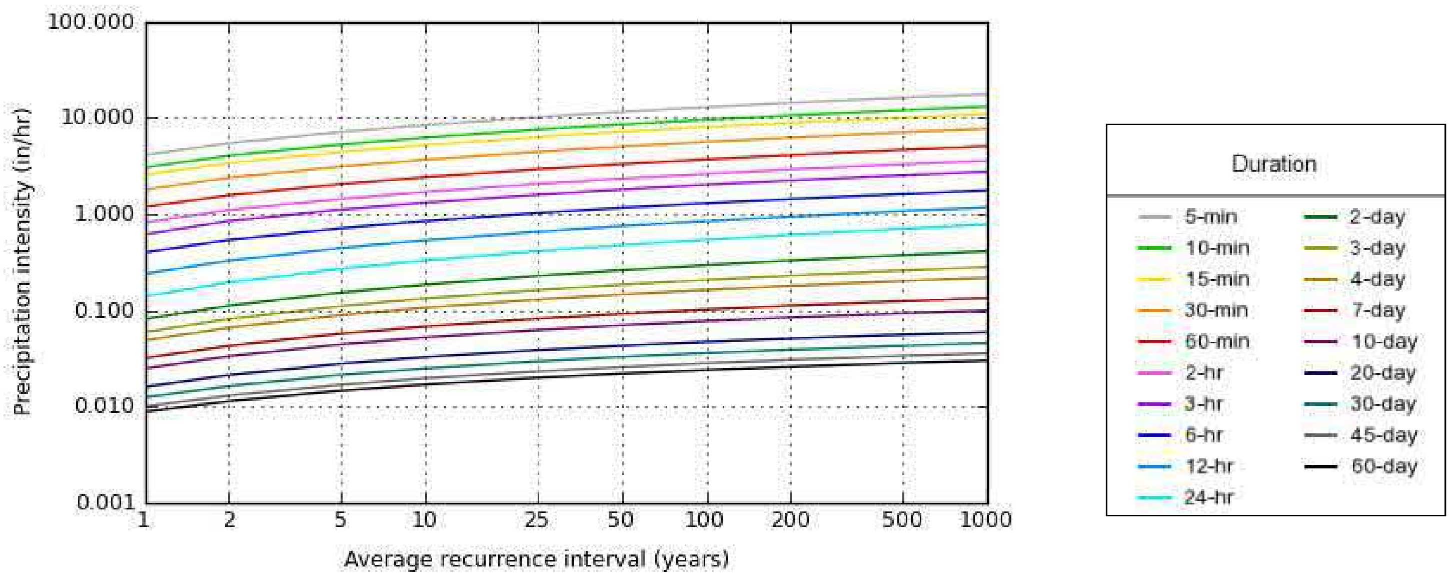
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



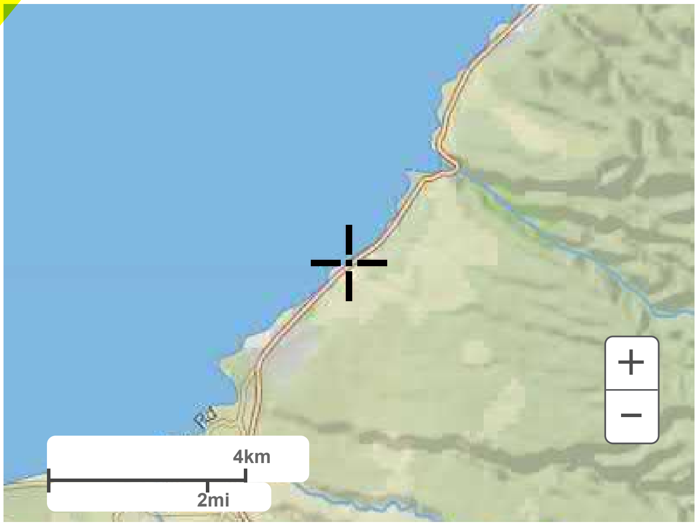


NOAA Atlas 14, Volume 4, Version 3 Created (GMT): Wed Feb 5 00:02:22 2020

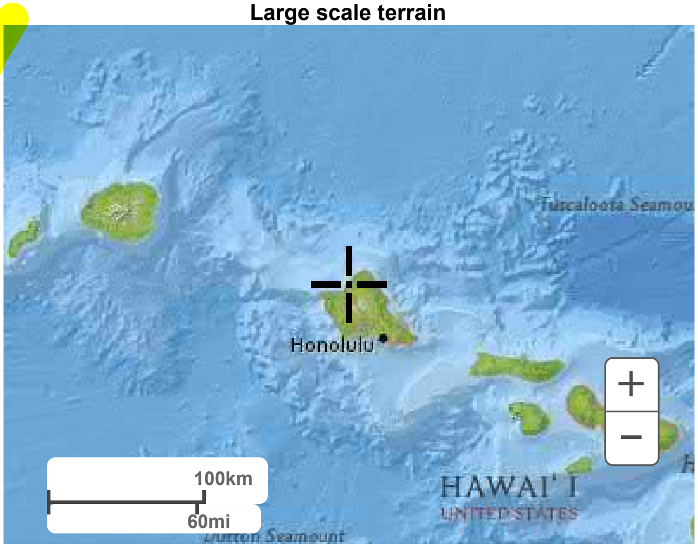
Back to Top

Maps & aerials

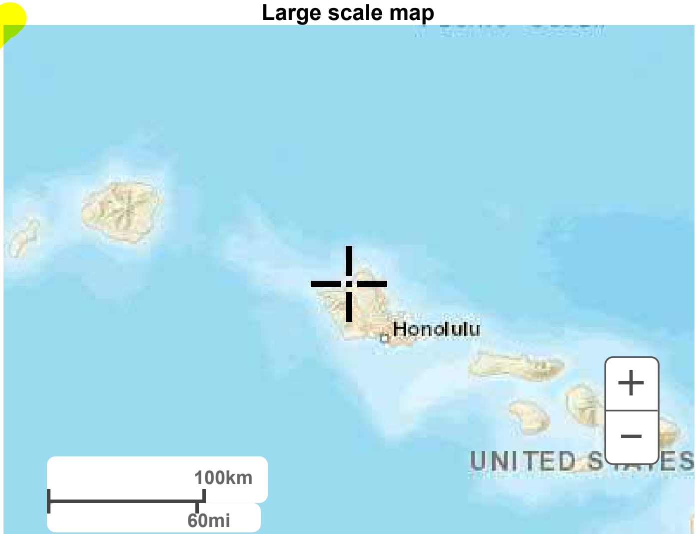
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

Back to Top

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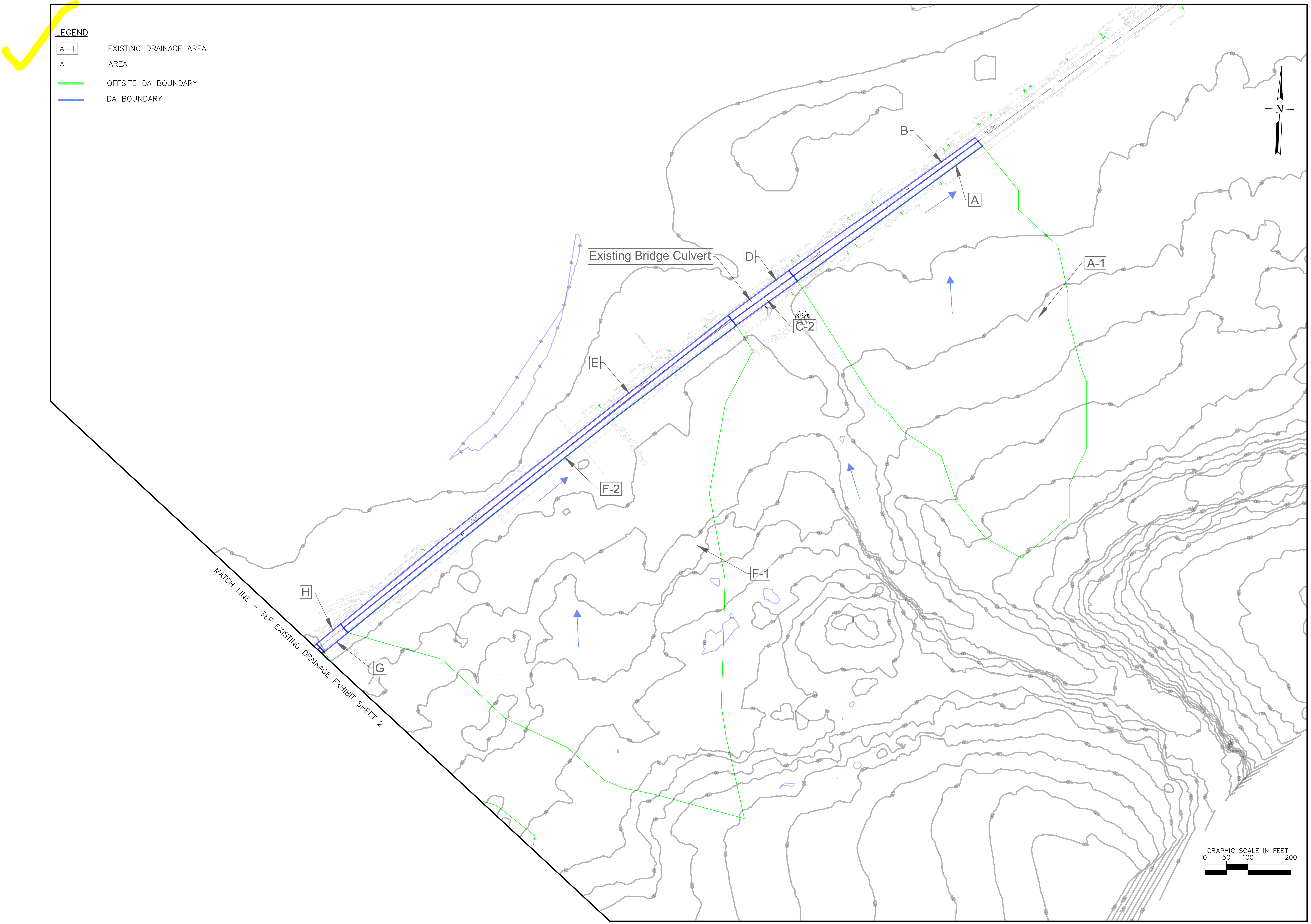
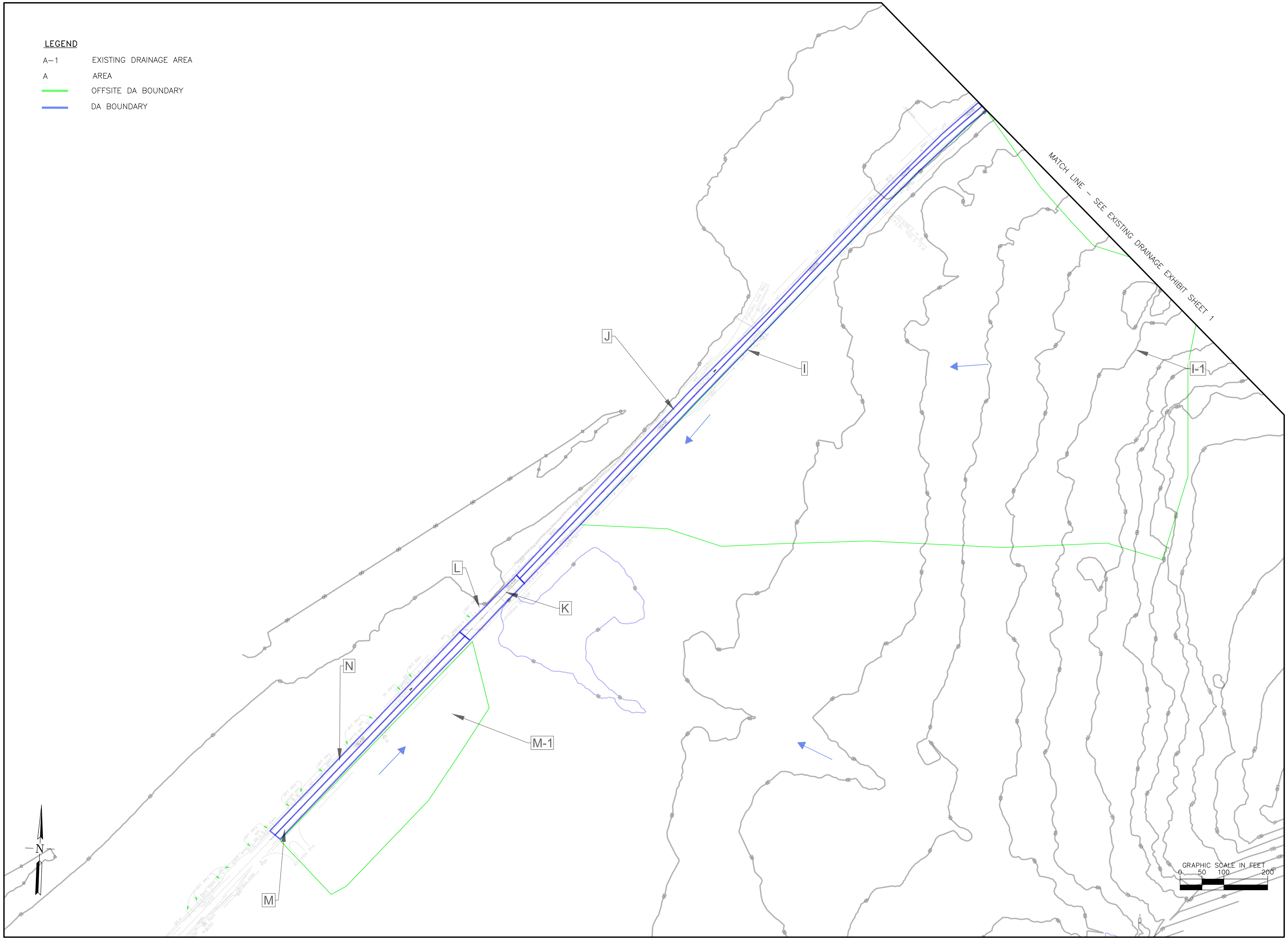
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

B EXISTING HYDROLOGY EXHIBIT

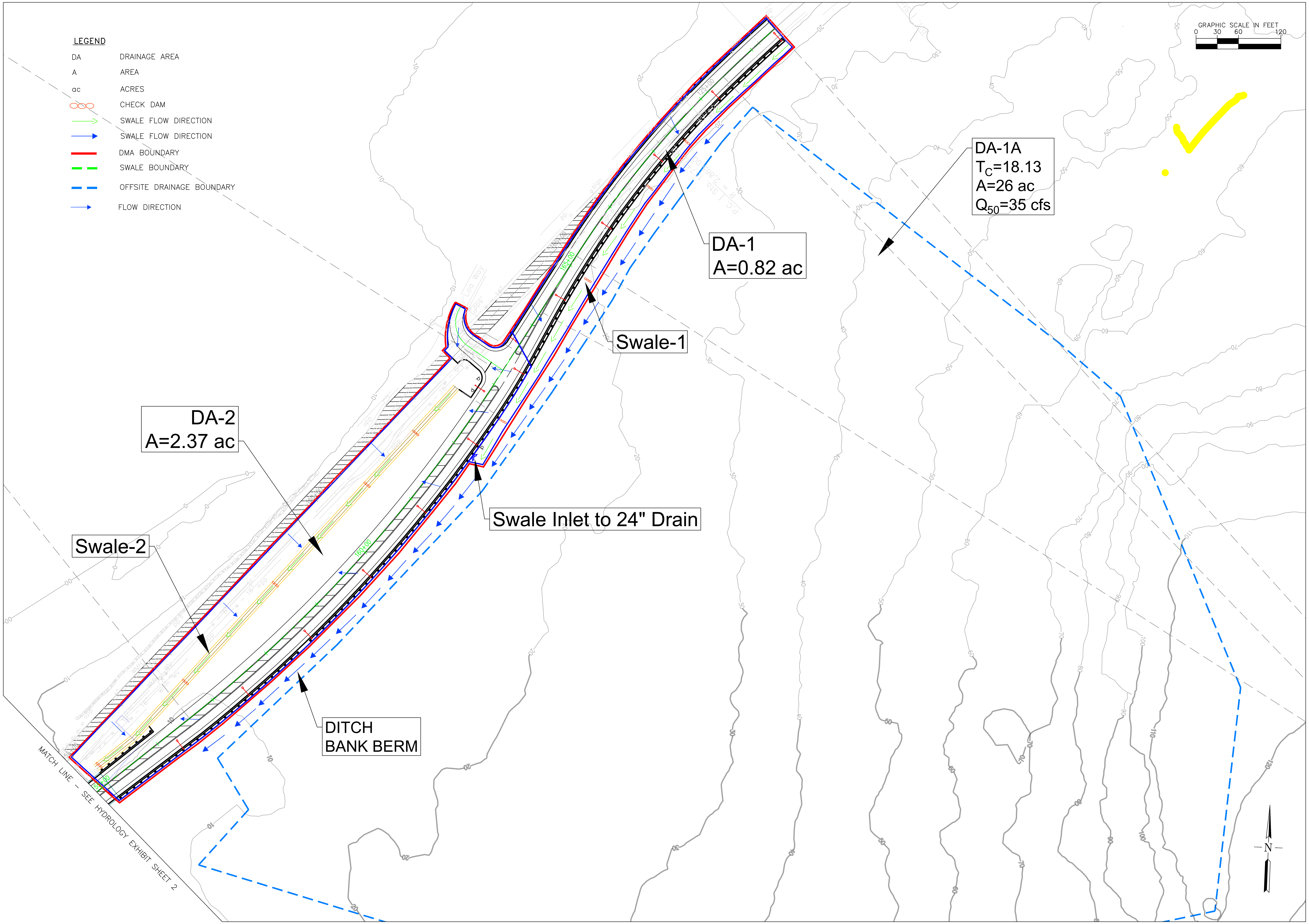


EXISTING DRAINAGE EXHIBIT SHEET 1

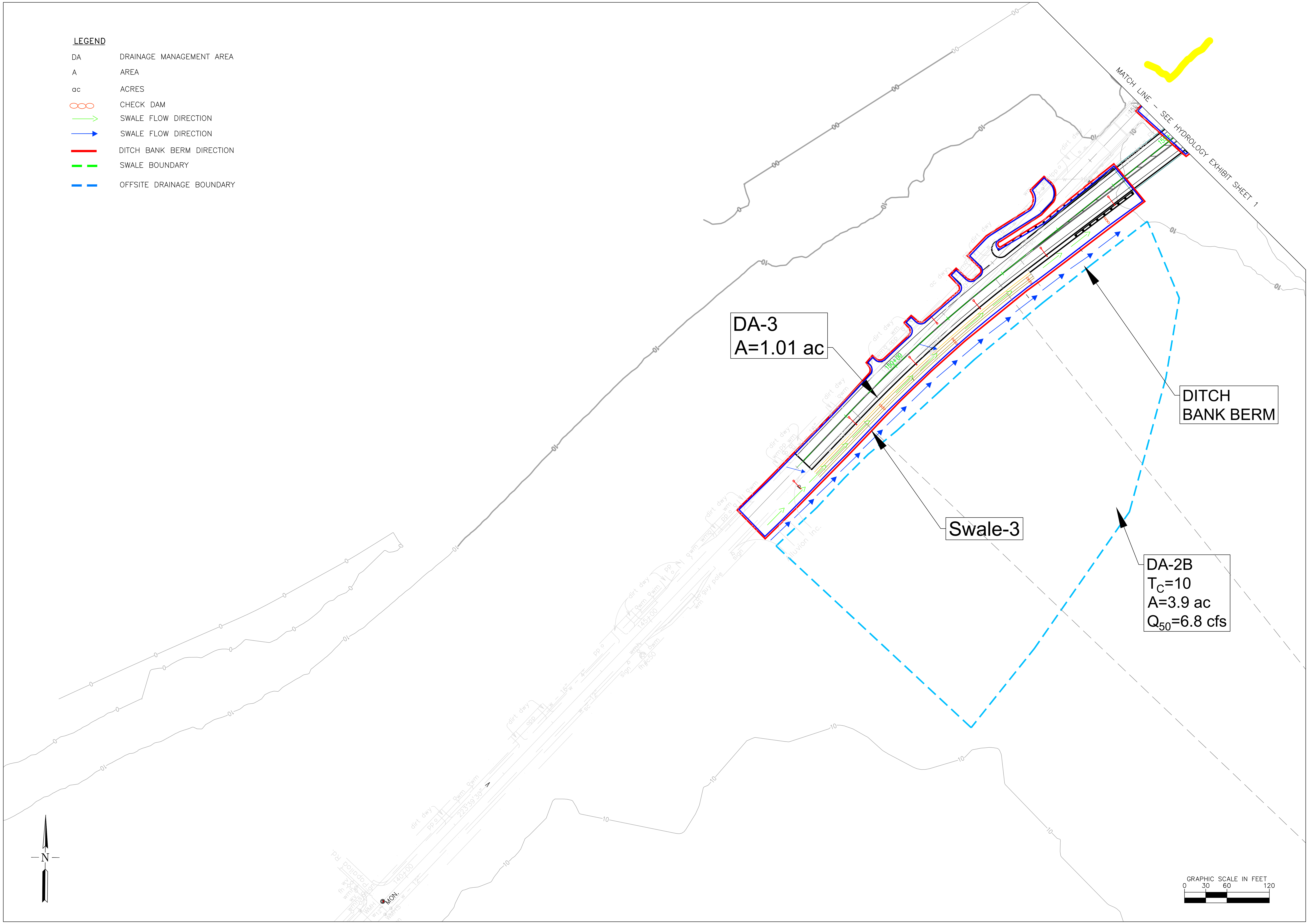


EXISTING DRAINAGE
EXHIBIT SHEET 2

C PROPOSED HYDROLOGY EXHIBITS



PEDESTRIAN SHIFT
HYDROLOGY
EXHIBIT 1



PEDESTRIAN SHIFT
HYDROLOGY
EXHIBIT 2

Appendix

H

Visual and Aesthetic Resources Technical Report

- TECHNICAL REPORT

Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach Visual and Aesthetic Resources

Haleiwa, Island of Oahu, Hawaii

April 2021

Prepared for:
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

TABLE OF CONTENTS

List of Figures

List of Tables

Acronyms, Abbreviations, and Translations

AVE	Area of Visual Effect
CZM	Coastal Zone Management
DLNR	Hawaii Department of Land and Natural Resources
EA	Environmental Assessment
FHWA	Federal Highway Administration
HDOT	Hawaii State Department of Transportation
Mauka	Mountain Side
Makai	Ocean Side
ROH	Revised Ordinances of Honolulu
Project	Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach
SMA	Shoreline Management Area
TSM	Transportation System Management

EXECUTIVE SUMMARY

This Visual and Aesthetic Resources Technical Report provides an assessment of changes in visual resources, visual character, and visual quality as a result of the proposed Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach. This assessment uses the U.S. Department of Transportation Federal Highway Administration's *Guidelines for the Visual Impact Assessment of Highway Projects* to evaluate changes to the natural, human, and project environments and how those changes would be perceived by viewers. (FHWA 2015)

The project and the viewers that may be impacted are discussed below; however, in general, proposed visual elements would be consistent and compatible with existing conditions. The project would have similar visual characteristics such as vegetation, materials, colors, form, height, and shape as the existing Kamehameha Highway. Thus, viewers would generally not experience adverse negative impacts and the project would blend visually with the existing natural, human, and project environments.

This technical report identifies the existing visual conditions of the natural, human, and project environments within the project study area. Information provided will inform the evaluation of options and will be used during the project's environmental review phase.

CHAPTER 1
INTRODUCTION

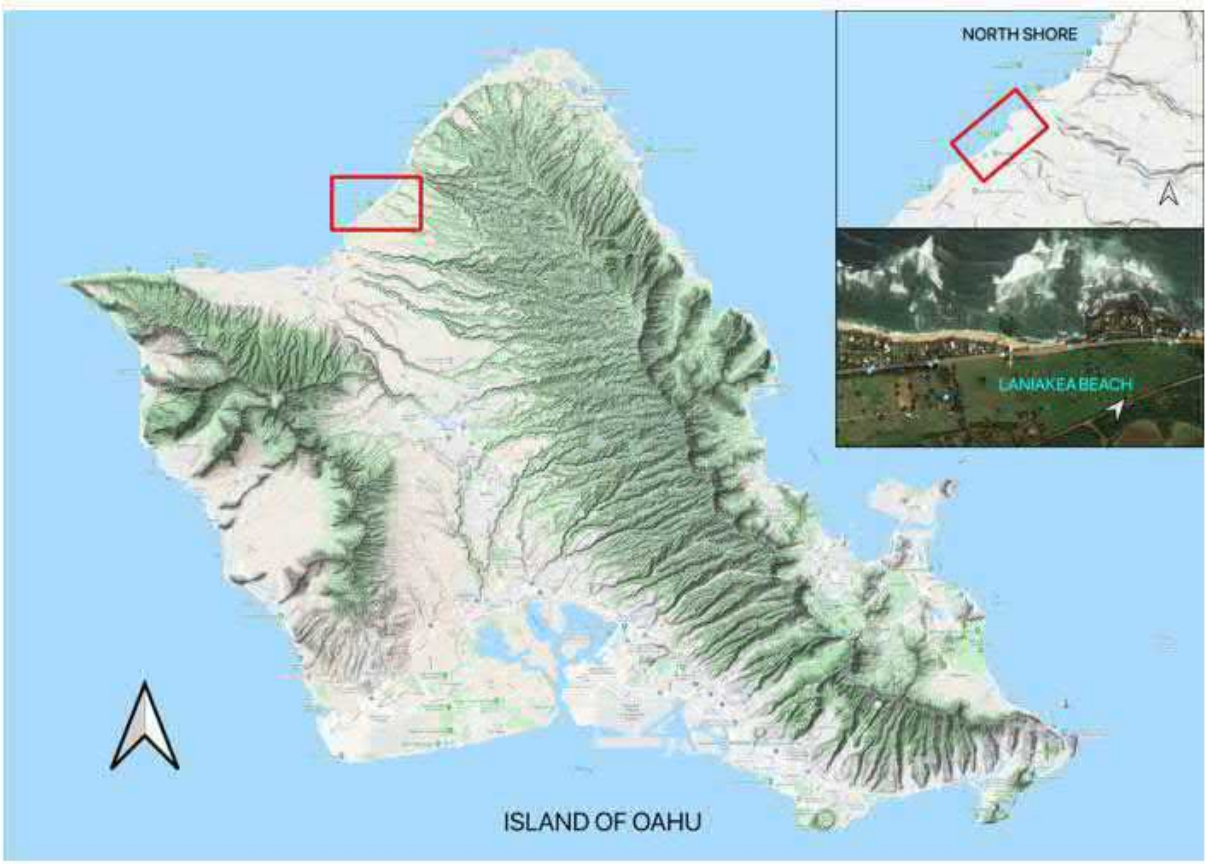
1.1 OVERVIEW

Coastal erosion is a perennial threat to various sections of Kamehameha Highway. The Hawaii Department of Transportation 2003 Statewide Highway Shoreline Protection Study identified the project area because of overtopping waves and stormwater run-off undercutting the boulder escarpment and beginning to undermine the highway within the right-of-way fronting Laniakea Beach (Figure 1-1).

In 2012, HDOT began various efforts to start evaluating alternatives and gathering input to an EA by multiple parties and stakeholders. The proposed project was to be paid for with federal and state funds designated to prevent erosion and keep the highway operational. However, during the discussions, the community emphasized their frustration with the congestion created by people parking on the mauka side of the highway and crossing to see the turtles that rest on the beach. Various meetings and conversations were had, but it was difficult to gain momentum considering any one alternative, and variations of the alternatives were provided by community members and groups. HDOT put public outreach efforts on hold while internally considering all the information that had been received throughout such efforts.

On August 1, 2019, a child was struck by a car on Kamehameha Highway and badly injured as he ran across the highway. HDOT prioritized the project, decided to use only State funds and changed the project's purpose and need to focus on pedestrian safety.

Figure 1-1. Project Location Map



1.2 PURPOSE OF TECHNICAL REPORT

This Visual and Aesthetic Resources Technical Report was developed to assess potential visual impacts resulting from the construction and operation of four roadway alternatives. It follows the abbreviated visual impact assessment approach within the U.S. Department of Transportation Federal Highway Administration's (FHWA) *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015).

This report identifies the viewer groups that would see the changes to the visual environment, documents how they would perceive those changes to the visual environment, and assesses whether it would result in changes to the existing visual quality of the area. This technical report also suggests how changes to the visual environment may be mitigated to reduce negative changes in visual quality and enhance the visual experience of travelers and neighbors. The project components would be seen by: motorists traveling along the Kamehameha Highway (Route 83) and local roads; pedestrians and bicyclists; and neighbors and community members.

CHAPTER 2
PROJECT DESCRIPTION

This section summarizes the regulatory context of the project, identifies the project's Area of Visual Effect (AVE), summarizes coordination and data sources, and describes the methodology used to assess impacts to visual quality and aesthetic resources.

2.1 REGULATIONS, CRITERIA, AND GUIDELINES

The following summarizes the federal, state, regional, and local regulatory context for this visual impact assessment.

2.1.1 Federal

The project will not use federal funding and will not be required to complete FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015). However, these guidelines, referred to as the "FHWA guidelines," are a broadly-accepted approach to analyzing visual impacts, particularly for transportation projects, and will be utilized to assess visual impacts for the project. The FHWA guidelines use changes in visual character and viewer group sensitivity to assess changes in visual quality. For this project, an abbreviated visual impact assessment generally following FHWA guidelines was conducted because:

- The project is not expected to result in a notable change in the physical characteristics of the existing environment.
- The project would be expected to be compatible with the existing visual character.
- Based on public engagement activities to date, there has been a low level of local concern regarding the project's visual components.
- Conventional mitigation such as landscaping and aesthetic treatments are expected to address visual changes.
- No adverse cumulative impacts are anticipated.

2.1.2 State

The following is the state regulatory context for this abbreviated visual impact assessment:

- **Hawaii Environmental Policy Act Chapter 343-5, Revised Statues**. A policy to that requires review of projects due to use of state or county lands and the use of state funds.

- **Hawaii Department of Health Administrative Rules Title 11, Chapter 200.1**. A the "Environmental Impact Statement Rules" for the State of Hawaii.
- **Hawaii Revised Statutes Chapter 205A, Coastal Zone Management (CZM)**. A policy to protect, preserve, and where desirable, restore, the quality of coastal scenic and open space resources. http://dlnr.hawaii.gov/occl/files/2013/07/205a.pdf
- **Special Management Area Regulations.** The authority established by the State's CZM program, but the City & County of Honolulu separately administer the Shoreline Management Area (SMA), which the project will trigger. HRS 205A-26 (1)(D) requires that the local authority review:

  "Alterations to existing land forms and vegetation, except cross, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities……"

2.1.3 Regional

The following is the regional regulatory context for this abbreviated visual impact assessment:

- **Revised Ordinances of Honolulu Chapter 25** sets the City's objectives and review procedures for the SMA permit (see link below). The permit review guidelines point back to the objectives and policies set in HRS 205A-26 (see quoted policy above). https://www.honolulu.gov/rep/site/ocs/roh/ROH_Chapter_25_article_1_12.pdf
- **North Shore Sustainable Community Plan**, dated May 2011. Section 3.1.2.7 contains guidelines and policies for "Scenic Resources and Scenic Views" on the North Shore. http://www.honoluludpp.org/Portals/0/pdfs/planning/NorthShore/NSSCP_May_2011.pdf

2.2 ESTABLISHMENT PHASE

Using FHWA guidelines, the visual impact assessment process is carried out in four phases: Establishment, Inventory, Analysis, and Mitigation. The primary purpose of the establishment phase is to define the AVE or the study area. The AVE is the area that can be seen from the project (limits of human sight), which is influenced by the physical constraints of landform, land cover, and atmospheric conditions (FHWA 2015). The establishment phase also sets an understanding of the character of the proposed project.

2.2.1 Area of Visual Effects

As described below, the AVE for the project considered visual distance zones and existing physical limitations. Additionally, a desktop analysis and field visit was conducted to understand the limits of visibility from the project limits.

Some views of the project are static and are what a neighbor would see from a single stationary location. Other views are dynamic and refer to a series of views available as a viewer travels through a landscape. Dynamic views are directional and can be quite different for viewers traveling in different directions. Dynamic views are also affected by whether a viewer is a driver whose primary focus is on driving or a passenger who has more discretion to look in other directions.

2.2.1.1 Visual Distance Zones

In general, there are three distance zones:

- Foreground: Comprises views from 0.0 mile to 0.25 mile. Changes to the visual environment are mostly discernible in this zone. Foreground views tend to be the most affected by changes in visual quality and views are generally not limited by atmospheric conditions. For the purposes of this technical report, impacts will primarily focus on viewers within the foreground distance zone.
- Middle ground: Comprises views from 0.25 mile to 5.0 miles. In this zone, most views are greatly reduced by landform (hills and mountains) and land cover (such as buildings, structures, signage, and other physical objects), as well as existing vegetation that limits the line-of-sight for viewers. In the middle ground, changes in visual details are generally not discernible. A small number of viewers on ridges above the elevation of the highway may have views of the project from the middle ground distance zone; however, viewer numbers will be small and visual details are generally not discernible in this zone. Atmospheric conditions typical of the island, including low clouds, fog, and precipitation, can further obscure visual elements.
- Background: Comprises views beyond 5.0 miles. Few, if any, viewers in the background distance zone would have unobstructed views of the project and project details and changes to visual quality would generally not be discernible from this distance. Land form, land cover, and existing vegetation are expected to completely obscure the site. Furthermore, atmospheric conditions would easily affect or obscure any available views from the background distance zone.

2.2.1.2 Physical Constraints

The highway corridor in the foreground is characterized by two lanes of asphalt pavement and shoulders of varying width, existing bridges over intermittent streams, signage, and at times, heavy vehicular traffic and congested parking on roadway shoulders. The coastal plain where the highway is located is generally 0.25 to 0.5 miles wide. Bluffs rising from the plain can be very steep and generally range from 100 to 250 feet in elevation. They are periodically cut by streams with steep side slopes. The bluffs block most views to the south and east of the highway corridor, including views of the scenic Koolau Mountains and the Ewa Forest Reserve.

The existing highway road grade along the coastal plain in the project area varies between approximately five and fifteen feet in elevation. The highway is lined with broadleaf trees, palm trees, and undergrowth typical of tropical Pacific Islands. The highway rises slightly north of Waimea Bay and offers more extended views; however, due to the rolling hills, bluffs, and existing vegetation, the project site is not visible from this location. Similarly, residential areas in the Pupukea community are located on the bluffs above the coastal plain and potentially have more extended views but views of the project are obscured by landform and vegetation.

Views of the project site are primarily limited to the foreground viewing zone.

2.2.2 Landscape Units and Visual Character

The AVE of a project is divided into distinct geographic units called Landscape units, or "outdoor rooms." (FHWA 2015) . Each landscape unit has a unique visual character, viewers, and visual quality that can be conceived of as a spatially defined landscape with a distinctive visual identity. Because the Kamehameha Highway project has a fairly consistent visual quality common throughout the project area, it would generally be considered as one Landscape Unit; however, a culturally sensitive area east of the project site may attract users who may be more sensitive to changes in visual quality; therefore, two landscape units will be considered:

- Kamehameha Highway
- Cultural Site

2.2.2.1 Kamehameha Highway

Areas of ranch land on the coastal plain on the mauka side of the highway, particularly in the vicinity of the proposed project, offer open views south and east of the highway toward the bluffs, and are characterized by pasture, fencing, and areas of common coastal vegetation (See Figure 2-1). Land cover, such as human-made structures, exist but is dispersed and generally not visible from the highway.

Figure 2-1. Typical Existing Mauka Side View from Kamehameha Highway in the Project Area

Periodic scenic beach and open ocean views are available on the makai side of the highway, including views at Laniakea Beach, which lies within the project limits. Generally, however, the makai side of the highway is characterized by human-made features and existing vegetation. Human-made features consist of one or two-story residential building structures with open and opaque fencing and gates of varying materials. These structures are typified by wood/vinyl siding, stucco, natural stone veneers, concrete, metal, glass, bright colors. (See Figure 2-2)

Indoor and outdoor electrical lighting is commonly visible from the highway corridor. Overhead utility lines are common within the highway corridor and can be on both the makai and the mauka sides of the highway.

Figure 2-2. Typical Existing Makai Side View from Kamehameha Highway in the Project Area

2.2.2.2 Cultural Site

A culturally sensitive site lies north and east of the project site along Kamehameha Highway. It is located on bluffs above the highway and overlooks Laniakea Beach. It has views extending both north and south into the middle and background distance zones; however, most views of the highway and human-made residential and commercial structures from the site are obscured by vegetation and the gently rolling terrain. (See Figure 2-3).

Figure 2-3. Typical Existing Cultural Site View

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CHAPTER 3
INVENTORY PHASE

The inventory phase examined the existing visual quality, or what people like or dislike seeing. It described the existing affected environment and visual character and the affected population or existing viewers, as presented in the following sections.

3.1 AFFECTED ENVIRONMENT

The affected environment is the existing visual character of the AVE. It can be assessed based on an inventory of visual resources divided into the natural, human, and project environments. (FHWA 2015)

- Natural: Land, water, vegetation, animals, and atmospheric conditions (devoid of build environment) determines the natural environments. Viewers evaluate if the environment is harmonious or inharmonious.
- Human: Buildings, infrastructure, structures, artifacts, and art determines human environments. Viewers evaluate if the environment is orderly or disorderly.
- Project: Constructed elements, grading, vegetation, and ancillary visual elements associated with the project development. Viewers evaluate if the environment is coherent or incoherent.

The natural, human, and project environments were assessed for each landscape unit and are presented below in Table 3-1.

Table 3-1. Affected Environment of the AVE

Landscape Unit	Description of Activity
Kamehameha Highway	
Natural	Land within the AVE of the highway ranges from 5 to 15 feet in elevation. Available views are primarily limited to the coastal plain with bluffs limiting views south and east; however, views in most locations are contained by trees, palms, coconut trees, and tropical vegetation lining the roadway. Natural elements such as native and ornamental landscaping are associated with human development on the makai side of the highway except where the road is located close to the beach and views of the ocean and beach are available. Laniakea and Kawailoa beaches offer scenic and natural visual elements. The mauka side is also characterized by natural and ornamental vegetation but vegetation visible from the highway is not typically in a natural condition. Open pastures exist in some locations that offer and longer views but are also limited by the bluffs.
Human	The Human AVE should be considered rural residential and ranchland. Residential structures on the makai side are typically one to two stories with both open and opaque fencing along the highway. Views from the highway are typically of garages and the back of buildings. Ranch buildings (residences, barns, sheds, etc.) on the mauka side of the highway are not typically visible from the road.

Project	The project component is the existing two-lane highway and paved and unpaved shoulders. Grades on both the mauka and makai side are generally with 12”-24” of the road grade and include shallow drainage swales in some locations. At Laniakea beach riprap retains the area under Kamehameha Highway for approximately 24”-36” below the road grade and then drops directly onto the beach. Overhead utility lines are on poles located on the mauka or makai sides or in some cases both sides. Road signs are generally limited to speed limit, no parking, or other small-scale signs.
Cultural Site	
Natural	The natural environment of this AVE includes gently rolling hills, bluffs, and views of the ocean. Natural visual elements include trees, palms, understory vegetation, and stone outcroppings. Views are also available of the mountains south of Haleiwa in the background distance zone.
Human	No modern human-made elements exist on the cultural site; however, portions of structures can be seen through vegetation in the foreground and middle distance zones and lights from residential structures can be seen during nighttime hours.
Project	Only very small patches of the existing roadway are visible from the Cultural Site through the existing vegetation. Overhead utility lines are visible in some locations. Street lights can also be seen in some locations during nighttime hours.

3.2 AFFECTED POPULATION

Viewers can generally be categorized into two distinct groups: neighbors and travelers. Both travelers and neighbors may be further subdivided to establish viewer preference and their sensitivity to changes in visual resources (FHWA 2015). Although each viewer will have individual preferences and sensitivities, FHWA guidelines recognize three basic responses to visual environments:

- When viewing the natural environment, viewers evaluate the natural harmony of the existing scene, determining if the composition is harmonious or inharmonious.
- When viewing the human environment, viewers evaluate the human order, determining if the composition is orderly or disorderly.
- When viewing the project environment, viewers evaluate the coherence of the project components, determining if the project’s composition is coherent or incoherent.

3.2.1 Types of Neighbors

Neighbors are viewers who typically view the project from a stationary location (see Table 3-2 below for details). Viewsheds are static and affected by landform and land cover. The AVEs for this project include the following types of neighbors (FHWA 2015):

- **Residential**: Residential neighbors include single-family residences located along the highway. Their visual preference tends toward maintaining existing landscape character and they are not generally interested in change. Depending on location, residential viewers prefer natural harmony and human order. The majority of viewers and human-made structures with views of project alternatives are residential.

- **Recreational**: Recreational neighbors participate in recreation and/or cultural activities and tend to be transitory. Their visual preference tends to be the status quo and they are leery of changes that may cause adverse impacts to their activity, although they may be willing to entertain improvements if they improve or enhance the recreational experience. Recreational viewers prefer natural harmony with some project coherence.
- **Commercial/Retail**: Commercial and Retail neighbors are merchants or shoppers that sell goods or services to the public. A small number of structures adjacent to the highway would be considered Commercial/Retail. Ranching, farming, or other non-residential neighbors south and east of the highway would also be considered commercial neighbors and would prefer some project coherence and order.

Table 3-2. Affected Neighbors

	Affected Population within the AVE	Visual Preference
Landscape Unit		
Kamehameha Highway	Commercial / Retail	Project Coherence, Human Order
	Residential	Human Order, Natural Harmony
Cultural Site	Purposeful Users	Natural Harmony, Project Coherence

3.2.2 Types of Travelers

Travelers are viewers who typically view as they move along a corridor, such as a road or a highway (see Table 3-3 below for details). Viewsheds are dynamic and change as a series of views reveals different views. Foreground, middle ground, and background views continuously change at different rates depending on the speed of the traveler. The AVEs for the landscape units include the following types of travelers (FHWA 2015):

- **Pedestrian**: Pedestrians use self-propelled means (walking, wheelchair, or other mobility aid) to move through a site on roadways, sidewalks, or trails. Pedestrians have a slight preference for human order over natural harmony and project coherence. A limited number of pedestrians use the highway shoulders and transit stops located within the project.
- **Bicycling**: Bicycles or other similar self-propelled devices travel through a site at a higher speed than pedestrians but much slower than vehicular travel. Bicyclists also have a slight preference for project coherence.
- **Motoring**: Motorists travel in vehicles propelled by engines such as cars, trucks, buses, or motorcycles. A variety of engine types, sizes, and fuel sources help propel travelers at higher speeds in comparison to other modes. Drivers primarily focus on activities associated with

driving and prefer project coherence. Passengers are typically less engaged with driving tasks and prefer natural harmony and human harmony.

Table 3-3. Affected Travelers

	Affected Population within the AVE	Visual Preference
Landscape Unit		
Kamehameha Highway	Motorist – Local	Project Coherence, Human Order
	Bicycling/Pedestrian	Project Coherence, Human Order
Cultural Site	Pedestrian	Project Coherence, Human Order

3.3 EXISTING VISUAL QUALITY

This section describes how professional judgment was applied to describe what viewers within each AVE for the project components would be expected to like and dislike about the existing environment and their perceptions of visual quality.

3.3.1 Kamehameha Highway

Figure 3-1 is a photograph of Kamehameha Highway looking northeast at Laniakea Beach. The terrain is relatively flat along the highway corridor. As shown, the natural environment is natural vegetation and landscaping associated with the roadway. Trees and vegetation on the makai side of the road line the beach or are located on residential properties (residential structures are not visible in the photograph). Vegetation lines most of the roadway on the mauka side; however, some ranch land pastures open up to the roadway where views extend south and east to the bluffs. The limited natural environment is harmonious, especially at Laniakea Beach where views of the beach and ocean are available from the highway.

The human environment is primarily residential properties along the makai side of the road and ranch lands on the mauka side. Viewer expectations are consistent along the highway. The project environment includes the two-lane highway and associated shoulders. Both the human and project environments become cluttered and non-coherent near Laniakea Beach as cars park along the shoulders. Traffic slows and congestion can be high at times.

Table 4-1, shown later in this document, describes the affected populations within Kamehameha Highway.

Figure 3-1. Kamehameha Highway – Existing Street View

3.3.2 Cultural Site

Figure 2-3 is a photograph from the Cultural Site looking south toward Haleiwa showing the existing conditions. The Cultural Site is located on a bluff overlooking the coastal plain and ocean. The natural environment is characterized by rolling hills, bluffs, trees, palms, tropical vegetation, and rock outcroppings. While ranchlands are common, taller vegetation obscures most open pastures. The vegetation and bluffs also entirely obscure most visual elements of the mostly flat highway corridor.

The Cultural Site is located on private property and gated. Limited access can be provided from Ashley Road approximately 200’ northeast of the site. Access is regulated and allowed at the landowner’s discretion, so the number of neighbors and travelers would be very small. Vegetation obscures most views of the human environment but some distant (middle ground) views of structures, overhead utility lines, and other human-made elements of the human environment are visible. Similarly, existing vegetation obscures most views of the project environment except screened views of the distant highway.

CHAPTER 4
VISUAL ANALYSIS

This section describes the visual changes anticipated to occur as a result of the project and specifically any changes to the overall visual quality of the AVE. Impacts to visual quality are discussed in terms of visual compatibility of proposed improvements, viewer sensitivity, direct impacts, activities during construction, and the resulting visual quality. The visual analysis will also include indirect and cumulative impacts in the next section.

4.1 PROJECT ALTERNATIVES

The project has identified four Alternatives for evaluation: 1) No Build Alternative, 2) Transportation System Management (TSM) which includes installing a guardrail or other type of barrier in accordance with all laws and regulations, 3) No Build Settlement Alternative which involves involves crosswalks and allowing cars to park on the mauka side of the highway, and 4) the Pedestrian Shift Alternative which moves to the road approximately 80 feet mauka. Each project alternative will have impacts on the natural, human and project visual environment.

4.2 NO BUILD ALTERNATIVE

The No Build Alternative would retain the existing road alignment in its existing condition and configuration. No improvements beyond routine operations and maintenance would be constructed / performed as part of the Kamehameha Highway corridor at this location.

Figure 4-1. Typical Section – Existing Conditions / No Build Alternative

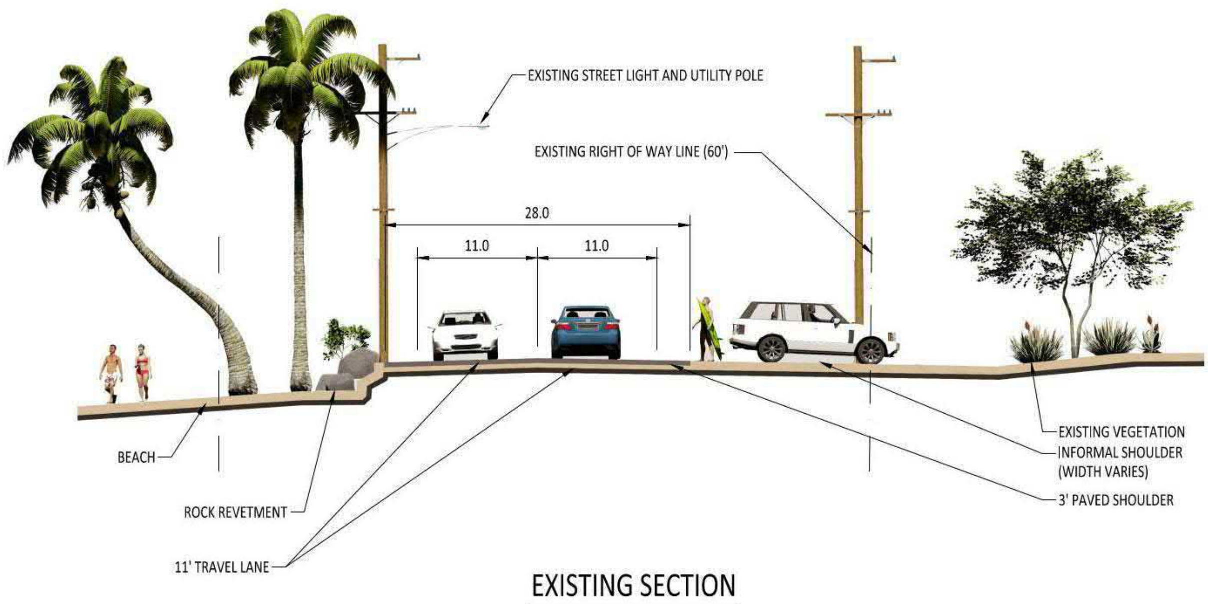
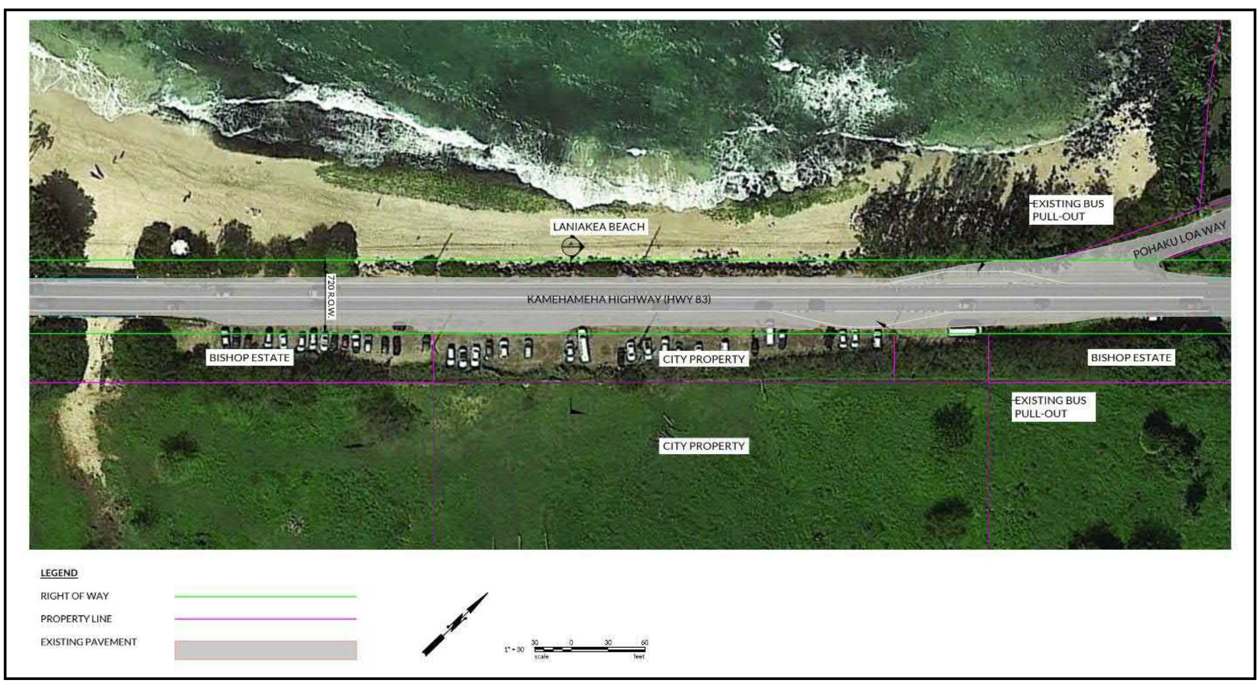


Figure 4-2. Plan View – Existing Conditions / No Build Alternative



4.2.1 Visual Compatability

There would be no change to the existing project scale, form, material, or visual character associated with the No Build Alternative.

Table 4-1. Viewer Sensitivity – No Build Alternative

Viewer Type	Exposure	Awareness	Distance	Overall Sensitivity
Kamehameha Highway				
Residential / Commercial	Low numbers of residential structures are located behind opaque fences, gates, and vegetation.	Attention and focus would not change in visual conditions. Views are of long duration and have become routine.	Due to the proximity of some residential viewers, as close as 20 feet from existing highway pavement, sensitivity would generally be high but most views are obscured by fences and vegetation.	Moderate
Motorist	High numbers of viewers utilize the highway corridor. The overall visual experience of motorists would not change.	Drivers and passengers would not experience a change in visual conditions. Views would be of short duration as motorists travel through the site.	Travelers would use roadways within the project limits. The posted speed is 35 miles per hour.	Low
Bicycle / Pedestrian	No formal bicycle or pedestrian facilities are provided along the existing highway corridor. The number of pedestrians traveling to Laniakea Beach can be high at times. They will not experience a change to the visual environment within the project AVE.	Bicyclists and pedestrians will not experience a change in visual conditions. Views would be of short duration.	Bicyclists and pedestrians would use the existing roadways within the project limits.	Low
Cultural Site				
Recreational	The Cultural Site is located on private property and gated with restricted access from Ashley Road. Existing trees, brush, and vegetation currently obscure all but distant views of the highway outside project limits. The number of recreational viewers at the Cultural Site would be very small.	Views are scenic but not protected. Views would be of short duration but would not change with this alternative. Attention and focus on scenic conditions would not change.	Recreational viewers would be within the foreground to middle ground proximity zones of project limits.	Low

4.2.2 Direct Impacts

There would be no change to the visual quality as the existing roadway would remain in place. Viewer exposure and awareness will not change and visual conditions for highway travelers, pedestrians, bicyclists, and neighbors would remain the same. The existing natural, human, and project environments will be compatible with the existing conditions; however, vehicle congestion, traffic conflicts, and unsafe pedestrian conditions would persist.

4.2.3 Construction Impacts

No construction would be associated with the No Build alternative.

4.2.4 Visual Quality

There would be no change to visual quality with the No Build alternative. The overall impact on visual quality would be neutral for both Highway and Cultural site neighbors and travelers.

4.3 NO BUILD SETTLEMENT ALTERNATIVE

The No Build Settlement Alternative was designed in response to a lawsuit that was brought against HDOT by a group of North Shore residents, activists, and surfers over the placement of barriers along the mauka side of Kamehameha Highway in 2014. A settlement was reached between the City and County of Honolulu (City), HDOT, and the litigants.

The settlement involves allowing cars to park on the mauka side of the highway to access Laniakea Beach, and will install guardrails and crosswalks along Kamehameha Highway. Cars will enter the parking area on the Haleiwa side and will exit on the Waimea side. In addition, the City will move a cattle fence on its property mauka of the highway so that cars have room to maneuver and park. The agreement prohibits the large tour buses and vans that often shuttle tourists to Laniakea Beach from stopping there. The settlement agreement calls for a one-year trial period, but there is no deadline for the changes to take place. During the trial period, the performance of the No Build Settlement will be evaluated for its impacts on, safety, traffic, and accessibility. HDOT is not responsible for implementing this alternative and no schedule has been provided to the community.

This alternative would result in an uninproved area that would provide space for roughly 50-60 passenger cars on the mauka side of Kamehameha Highway.

Figure 4-3. Typical Section – No Build Settlement Alternative

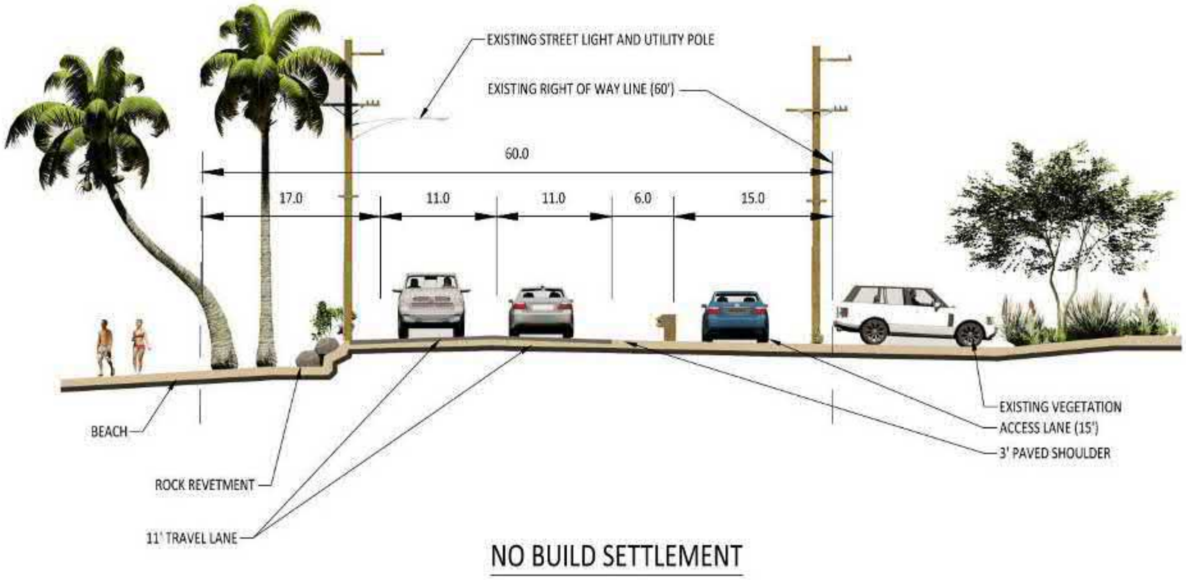
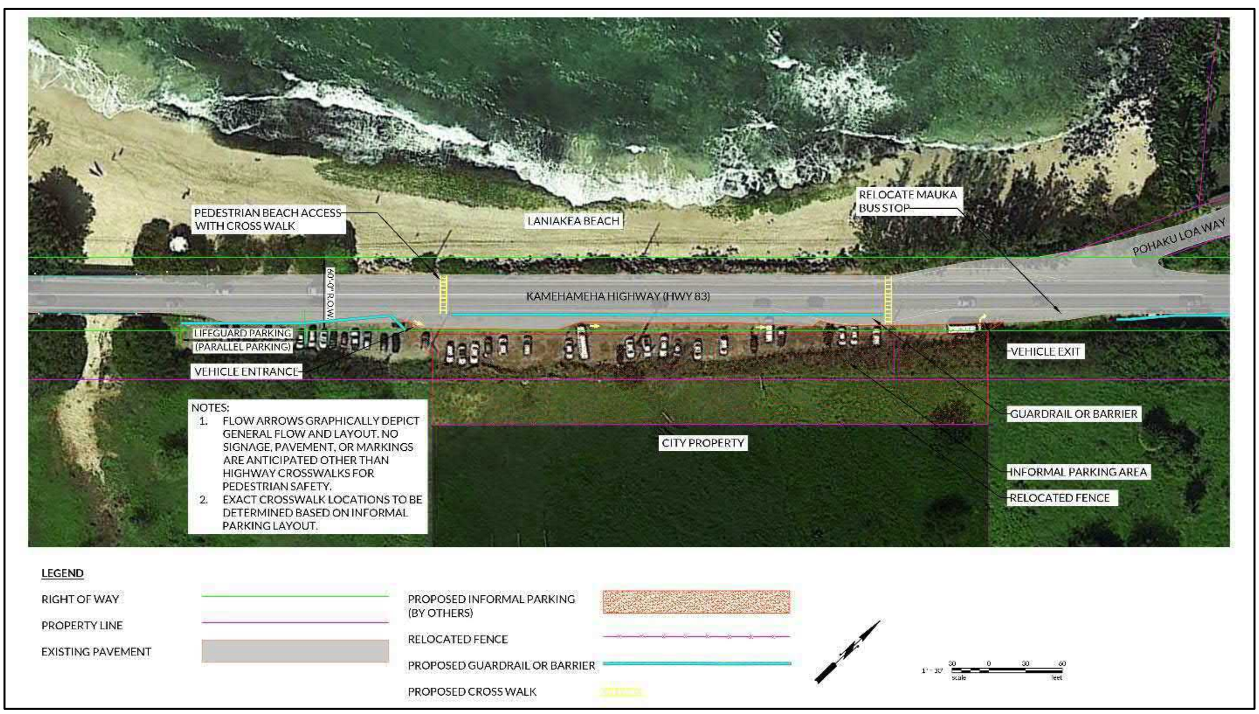


Figure 4-4. Plan View – No Build Settlement Alternative



4.3.1 Visual Compatability

No change is proposed to the form or material of the roadway but this alternative would construct approximately 700 feet of guardrails, expand the informal parking area on the mauka side of the highway on City-owned property, and add crosswalks within the immediate vicinity of Laniakea Beach. Additionally, existing transit stops will be moved to accommodate the guardrail and informal parking. All new roadway and auxiliary features are common visual elements within the existing Kamehameha Highway corridor and would be compatible with the scale, form, materials, and character of the existing visual environment. Existing elements of parked cars and pedestrians would remain but the guardrails and crosswalks would reduce vehicular conflicts and improve pedestrian safety.

While adding guardrails, crosswalks, and expanding the informal parking near Laniakea Beach would change the size and scale of the existing visual elements, they are all common materials within the Kamehameha Highway corridor. The proposed No Build Settlement Alternative and associated guardrail would be compatible with existing visual conditions.

Table 4-2. Viewer Sensitivity – No Build Settlement Alternative

	Exposure	Awareness	Distance	Overall Sensitivity
Kamehameha Highway				
Neighbor: Residential / Commercial	A low number of residences would have direct views; however, fencing and vegetation would obscure most views of the guardrail. Views of congested parking would be partially obscured by the guardrail.	Attention and focus would not change in visual conditions. Static views would be of long duration and would become routine.	Due to the proximity of some residential viewers, as close as 50 feet from the proposed guardrail, sensitivity would generally be high but most views are obscured by fences and vegetation.	Moderate
Traveler: Motorist	High numbers of viewers utilize the highway corridor. The overall visual experience of motorists would be similar to existing conditions. The project's visual environment would be consistent with their expectations.	Motorists would primarily be focused on driving and would have short-duration dynamic views. Passengers may be more aware but would also have short-duration views.	Travelers would use roadways within the project limits. The posted speed is 35 miles per hour.	Low
Traveler: Bicycle / Pedestrian	No formal bicycle or pedestrian facilities are provided along the existing highway corridor. The visual environment would benefit from crosswalks, off-road access, and reduced vehicular conflicts.	Bicyclists and pedestrians would be less sensitive to visual changes to the highway corridor due to short-duration dynamic views and focus would primarily be on traveling to and from the beach.	Bicyclists and pedestrians would use the roadways within the project limits.	Low

Cultural Site				
Neighbor: Recreational	Existing trees, brush, and vegetation currently obscure all but distant views of the highway outside project limits. The number of recreational viewers at the Cultural site would be very small.	Views are scenic but not protected. Views would be of short duration but would not change with this alternative. Attention and focus would not change.	Recreational viewers are within foreground and middle ground proximity zones.	Low

4.3.2 Direct Impacts

The existing natural, human, and project environments will be compatible with the existing conditions as the form, material and visual character of the existing roadway would remain. Although guardrail is common along the existing Kamehameha Highway corridor, the scale and extent of the proposed guardrail would slightly increase exposure for highway travelers, pedestrians, and bicyclists. Adding guardrail along the mauka side of Kamehameha Highway would separate highway motorists from the informal paring area and would reduce vehicular conflicts. The addition of crosswalks would also increase pedestrian safety by congregating pedestrians at the designated and marked crosswalks. The overall impacts on the existing visual environment will be beneficial to highway users.

Residential and commercial viewers in close proximity to roadway improvements would typically have a high degree of sensitivity to change in the visual environment; however, existing fences, gates, vegetation, and structures will obscure views of the guardrail for most viewers and may benefit from a more orderly parking condition. Any potential views of the No Build Settlement Alternative would become routine as these views would be of long duration. Neighbors will likely have a moderate sensitivity to visual changes associated with the No Build Settlement Alternative.

Existing vegetation is expected to obscure all views of the proposed No Build Settlement Alternative from the Cultural Site for recreational and pedestrian viewers. Neighbors and travelers would have a low sensitivity to change.

4.3.3 Construction Impacts

Construction equipment and activities may be noticeable throughout the active construction period. Although HDOT is not involved in the implementation of this project, construction is estimated to last approximately 1 month.

Construction equipment is likely to include heavy trucks, augers, and/or a small truck mounted crane. This equipment is often brightly colored to promote visibility and safety. Other sources of visual changes during construction would include staging areas, material storage, trailers, fencing, vehicular and pedestrian detours, construction signing, flashing safety lights, and work lighting. Visual detractions from construction activities would be removed upon completion of the project. Construction activities and equipment are not expected to be visible from the Cultural Site.

4.3.4 Visual Quality

The No Build Settlement Alternative would utilize the existing roadway, pavements, shoulders, and alignment. The guardrail would be constructed within the existing disturbed right-of-way and on City-owned property. The overall landform of the area would not change as the existing roadway would not change and views of the beach and open ranchlands would not be adversely affected. The installation of guardrail along the project area would add visual elements but would not degrade any sensitive natural visual resources in the AVE, including beach vegetation and may help to protect some disturbed roadside vegetation. The informal parking area would expand to allow room for parking and maneuvering. Some vegetation would likely be affected but most existing vegetation is small shrubs and grasses that are not in a native condition and would quickly naturalize. The project would be neutral to natural harmony.

The human environment would remain orderly as the project proposes no change to existing structures, fencing, or other human-made elements. The project environment would be consistent with the type, shape, and form of the existing roadway. Conflicts associated with parked cars, which can be heavy at times and visual clutter would be reduced as the guard rails separate parked cars from the travel lanes. Proposed crosswalks would lessened vehicle conflicts and create a safer environment for pedestrians. Visual coherence in the project environment would be improved and the overall impact on visual quality would be neutral to beneficial for both the Kamehameha Highway and Cultural Site neighbors and travelers.

4.4 TSM ALTERNATIVE

The Transportation System Management (TSM) alternative would utilize the existing highway alignment but would construct a guardrail on the mauka side within the Kamehameha Highway right-of-way fronting Laniakea Beach (Figure 4-5). The guardrail would be an estimated 1,000 linear feet long and would improve pedestrian safety, protect coastal resources, and enhance beach safety by enforcing the the no parking condition along the State Highway facility. All applicable rules and regulations would be adhered to as appropriate. As this alternative would be fully state-funded, all state rules and regulations would apply.

Figure 4-5. Typical Section – TSM Project Alternative

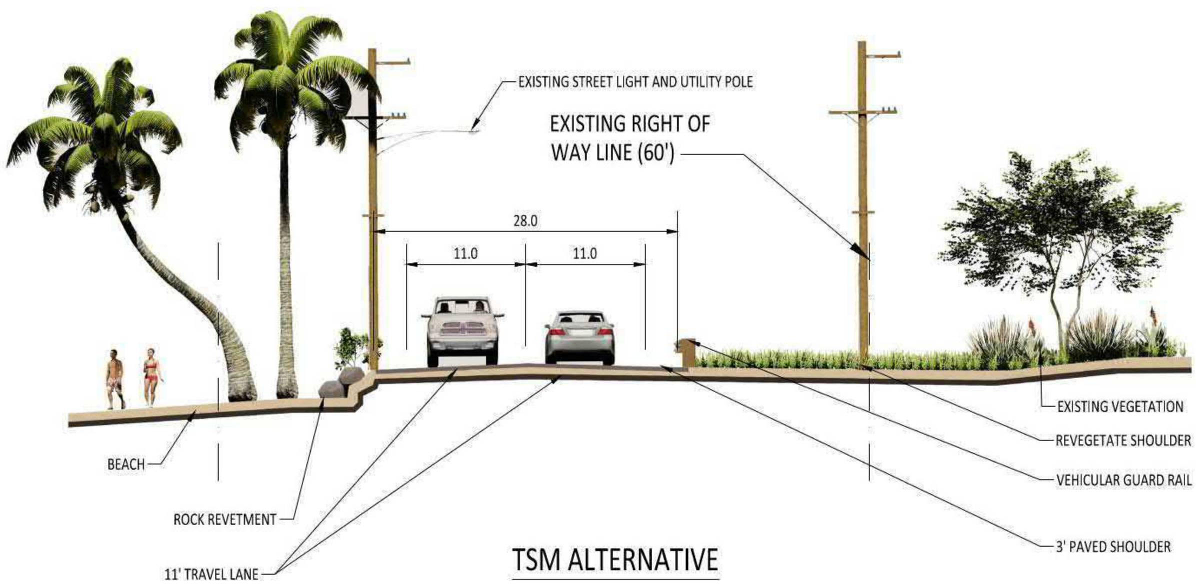


Figure 4-6. Plan View – TSM Project Alternative

4.4.1 Visual Compatability

No change is proposed to the form or material of the roadway but this alternative would construct approximately 1,000 linear feet of guardrail on the mauka side of the highway within the immediate vicinity of Laniakea Beach.

While adding guardrail in the immediate vicinity of Laniakea Beach would change the size and scale of this visual element, guardrail is a common material within the Kamehameha Highway corridor. Additionally, currently disturbed areas behind the proposed guardrail would be revegetated, which could add new natural visual elements to the area. The proposed TSM Alternative and associated guardrail would be compatible with existing visual conditions.

Table 4-2. Viewer Sensitivity – TSM Alternative

	Exposure	Awareness	Distance	Overall Sensitivity
Kamehameha Highway				
Neighbor: Residential / Commercial	A low number of residences would have direct views; however, fencing and vegetation would obscure most views of the guardrail. Views of congested parking would be eliminated.	Attention and focus would not change in visual conditions. Static views would be of long duration and would become routine.	Due to the proximity of some residential viewers, as close as 50 feet from the proposed guardrail, sensitivity would generally be high but most views are obscured by fences and vegetation.	Moderate
Traveler: Motorist	High numbers of viewers utilize the highway corridor. The overall visual experience of motorists would be similar to existing conditions. The project's visual environment would be consistent with their expectations.	Motorists would primarily be focused on driving and would have short duration dynamic views. Passengers may be more aware but would also have short duration views.	Travelers would use roadways within the project limits. The posted speed is 35 miles per hour.	Low
Traveler: Bicycle / Pedestrian	No formal bicycle or pedestrian facilities are provided along the existing highway corridor. The visual environment would benefit with reduced vehicular conflicts.	Bicyclists and pedestrians would be less sensitive to visual changes to the highway corridor due to short duration dynamic views and focus would primarily be on traveling to and from the beach.	Most bicyclists and pedestrians would use the roadways within the project limits.	Low
Cultural Site				

Neighbor: Recreational	Existing trees, brush, and vegetation currently obscure all but distant views of the highway outside project limits. The number of recreational viewers at the Cultural site would be very small.	Views are scenic but not protected. Views would be of short duration but would not change with this alternative. Attention and focus would not change.	Recreational viewers are within foreground and middle ground proximity zones.	Low

4.4.2 Direct Impacts

The existing natural, human, and project environments will be compatible with the existing conditions as the form, material and visual character of the existing roadway would remain. Although guardrail is common along the existing Kamehameha Highway corridor, the scale and extent of proposed guardrail would slightly increase exposure for highway travelers, pedestrians, and bicyclists. It should be noted, however, that adding guardrail along the highway in this location would reduce vehicular congestion in the area. The addition of guardrail along the mauka side of Kamehameha Highway would reduce the likelihood of pedestrian / vehicular conflicts.

Residential and commercial viewers in close proximity to roadway improvements would typically have a high degree of sensitivity to change in the visual environment; however, fences, gates, vegetation, and structures will obscure views of the guardrail for most viewers. Any potential views of the TSM Alternative would become routine as these views would be of long duration. Neighbors will likely have a moderate sensitivity to visual changes associated with the TSM alternative.

Vegetation is expected to obscure all views of the proposed TSM Alternative from the Cultural Site for recreational and pedestrian viewers. Neighbors and travelers would have a low sensitivity to change.

4.4.3 Construction Impacts

Construction equipment and activities may be noticeable throughout the active construction period. Construction of this project alternative would be expected to last approximately 1 month.

Construction equipment is likely to include heavy trucks, augers, and/or a small truck-mounted crane. This equipment is often brightly colored to promote visibility and safety. Other sources of visual changes during construction would include staging areas, material storage, trailers, fencing, vehicular and pedestrian detours, construction signing, flashing safety lights, and work lighting. Visual detractions from construction activities would be removed upon completion of the project. Construction activities and equipment are not expected to be visible from the Cultural Site.

4.4.4 Visual Quality

The TSM Alternative would utilize the existing roadway, pavements, shoulders, and alignment. The guardrail would be constructed within the existing disturbed right-of-way of the existing highway. The installation of this length of guardrail along the project area would not degrade any sensitive natural visual resources in the AVE, including beach vegetation and mature trees. The overall landform of the area would not change as the existing roadway would not change and views of the beach and open ranchlands would not change. The remaining disturbed area behind the guardrail would be seeded and would naturalize over time. The project would be neutral to beneficial to natural harmony.

The human environment would remain orderly as the project proposes no change to structures, fencing, or other human-made elements. The project environment would be consistent with the type, shape, and form of the existing roadway. The proposed guardrail would reduce vehicle congestion and pedestrian conflicts, creating a safer environment due to lessened vehicle / pedestrian conflicts in the area. Visual clutter associated with the parked cars, which can be heavy at times, would be eliminated. Visual coherence in the project environment would be improved and the overall impact to visual quality would be neutral to beneficial for both the Kamehameha Highway and Cultural Site neighbors and travelers.

4.5 PEDESTRIAN SHIFT ALTERNATIVE

The Pedestrian Shift Alternative would realign approximately 1,100 linear feet of the Kamehameha Highway mauka (inland) and away from the most intense coastal hazard zone, and would include a new bridge over Lauhulu Stream (also referred to as Laniakea Stream or Kūkaeʻōhiki Gulch). The proposed Pedestrian Shift Alternative would diverge from the existing Kamehameha Highway beginning approximately 310 feet southwest of Lauhulu Stream and a new bridge would span the stream for approximately 100 feet. The new alignment would then merge back to the existing Kamehameha Highway approximately 450 feet northeast of Pohaku Loa Way. A connector road north of Laniakea Beach and a vehicle control gate would provide residential access to Pohaku Loa Way.

Because this alternative would result in a shift to the existing Kamehameha Highway, there would conservatively be spaces for roughly 90 passenger cars on the mauka side of the roadway.

Sections of the existing Kamehameha Highway adjacent to Laniakea Beach and the existing bridge over Lauhulu Stream would remain as pedestrian access and provide emergency access to Laniakea Beach.

Vehicular control measures (e.g., concrete piles, guardrails) would be placed between the existing roadway and the new roadway for vehicle control and fencing and guardrails would provide additional pedestrian safety adjacent to the proposed bridge and stream bed. Residential and commercial driveways would be extended where necessary to maintain access to the shifted Kamehameha Highway.

Facilities included with this alternative would consist of:

- A two-lane highway, with one lane of traffic in each direction and a 10’ refuge median for left-turning movements.
- One new bridge at Lauhulu Stream (on the Haleiwa side of Laniakea Beach).
- The existing bridge and a portion of the existing road would be utilized for cycling and walking (makai side would be demolished and replanted/renaturalized).

Figure 4-7. Typical Section – Pedestrian Shift Alternative

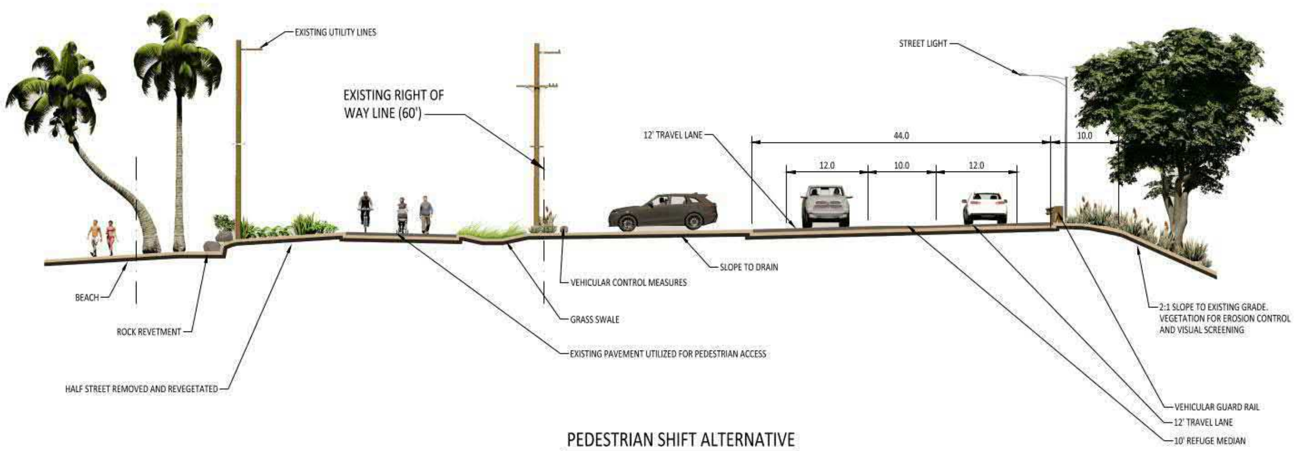


Figure 4-8. Plan View – Pedestrian Shift Alternative

4.5.1 Visual Compatability

All new roadway and auxiliary features are common visual elements within the existing Kamehameha Highway corridor and would be compatible with the scale, form, materials, and character of the existing visual environment.

Table 4-3. Viewer Sensitivity – Pedestrian Shift Alternative

	Exposure	Awareness	Distance	Overall Sensitivity
Kamehameha Highway				
Neighbor: Residential / Commercial	This alternative would be visible from the closest residential viewers; however, the highway would move away from adjacent residential lots. A small number of commercial views on the mauka side would be visually impacted.	Static views would be of long duration and residential viewers are sensitive to change; however, attention and focus would continue to be directed toward scenic visual resources. The change due to the proposed shift would become routine.	Due to the proximity of some residential viewers, sensitivity would be high but the roadway would move away from these viewers and most views would be obscured by fences and vegetation	Low

Traveler: Motorist	High numbers of viewers utilize the existing Kamehameha Highway corridor. The project's visual environment would be consistent with their expectations but would have the beneficial effects of reduced pedestrian conflicts and the construction of a refuge median.	Motorists would primarily be focused on driving. Passengers may be more aware but would have short duration dynamic views.	Travelers would use roadways within the project limits. The posted speed would likely be 35 miles per hour.	Low
Traveler: Bicycle / Pedestrian	Bicycle and pedestrian facilities would be provided along the existing highway corridor. The visual environment would benefit from reduced pedestrian / vehicular conflicts.	Focus and awareness will shift away from pedestrian / vehicular conflicts for bicyclists and pedestrians with dynamic views.	Most bicyclists and pedestrians would use the roadways within the project limits.	Low
Cultural Site				
Neighbor: Recreational	Existing trees, brush, and vegetation currently obscure all but distant views of the highway outside project limits. The number of recreational viewers at the Cultural site would be small.	Views are scenic but not protected. Viewers may experience minor changes in visual conditions but would be of short duration and attention and focus would remain on scenic resources.	Recreational viewers are within foreground and middle ground proximity zones.	Low

4.5.2 Direct Impacts

Moving the highway 80 feet to the mauka side of the highway will displace some of the vegetation at the edge of the existing ranchland; however, this vegetation is not in a natural condition. The makai half of the existing roadway would be demolished and rock, vegetation, and slope stabilization measures would be placed to prevent soil and beach erosion and would add natural visual elements between the beach and proposed roadway. Revegetation and replanting efforts on both sides of the proposed roadway will provide erosion control and visual screening for neighbors, including viewers from the Cultural site.

No residential or commercial structures, fencing, or other human-made elements will be impacted. Vehicular access to the existing residences on the Haleiwa side of the stream would be extended to the proposed highway pavement and the existing Kamehameha Highway pavement would be demolished and replanted which will provide visual screening and buffering for the residential viewers. The resulting changes will provide beneficial effects to the natural environment for most neighbors and travelers.

The mauka side of the existing road and the existing bridge will remain as separate pedestrian and bicycle facilities. This will allow these travelers to shift focus and attention from roadways and vehicular conflicts to the scenic natural features. While most visual elements associated with the realigned road are existing in the highway corridor, the size and scale of widened road, refuge median, guardrails, and other ancillary elements may impose slight adverse effects to motorists and a small number of commercial neighbors; however, the human and project environments will be orderly and coherent for neighbors and travelers.

Most views of the project from the Cultural Site will be obscured by existing vegetation. Landforms and existing vegetation would likely obscure all views of the project site for pedestrian travelers to the Cultural Site. Relocated utility poles and streetlights may be visible above the tops of existing trees and shrubs. Light spill from street lights may be visible from the Cultural Site in nighttime conditions; however, these are existing visual elements and new lights could be shielded to reduce glare during nighttime hours. Figure 4-9 shows the existing view from the Cultural Site during daytime and Figure 4-10 shows the exsting view from the Cultural Site during nighttime.

Figure 4-9. Photographic Simulation – Pedestrian Shift, Cultural Site at Daytime

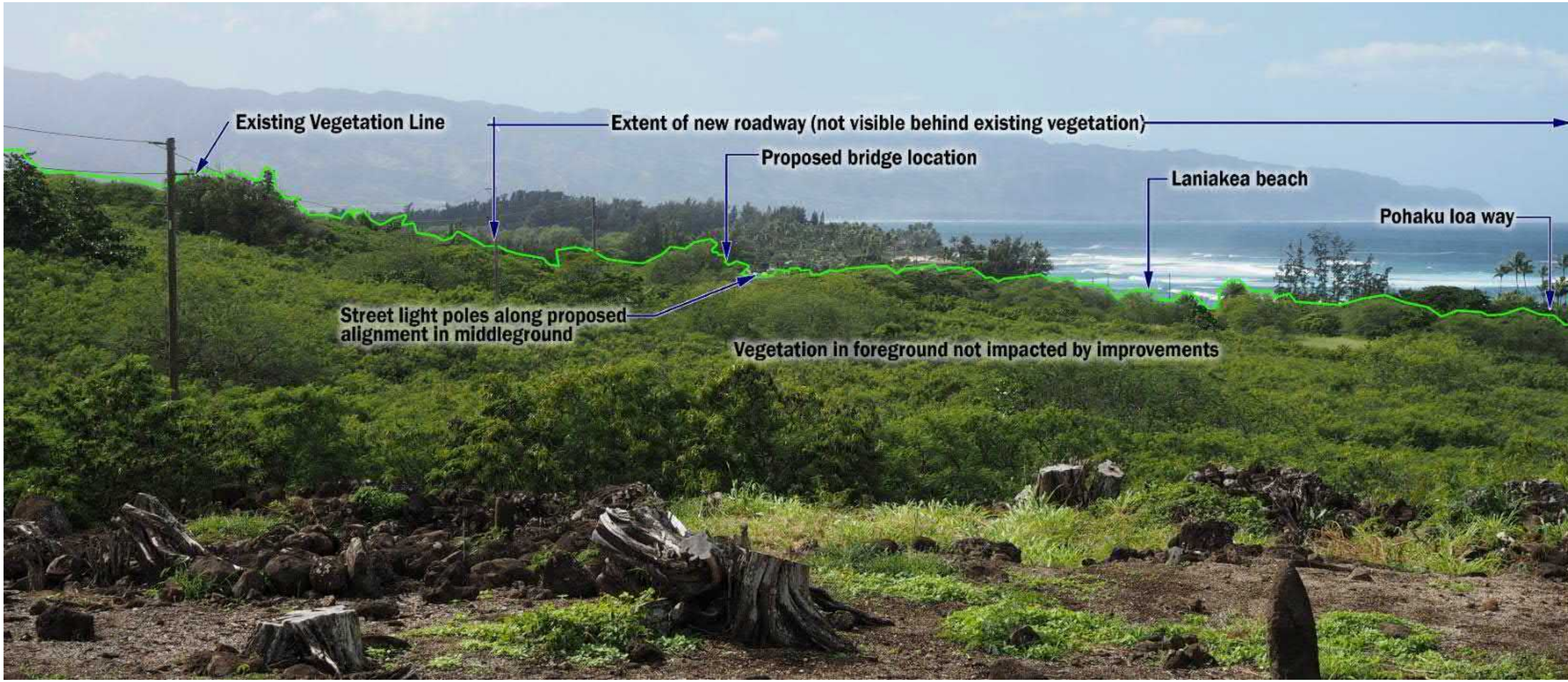


Figure 4-10. Photographic Simulation – Pedestrian Shift, Cultural Site at Nighttime

4.5.3 Construction Impacts

Construction equipment and activities may be noticeable throughout the active construction period. The design and construction of this project alternative would be expected to last approximately 18 months.

Construction would occur primarily within the immediate vicinity of Laniakea Beach. Construction equipment and activities may be noticeable throughout the active construction period. For this project, construction equipment is likely to include excavators, loaders, backhoes, bulldozers, compactors, trucks, mixers, and cranes. This equipment is often brightly colored to promote visibility and safety. Other sources of visual changes during construction would include staging areas, material storage, trailers, fencing, vehicular and pedestrian detours, and construction signing. Flagging crews, construction access, barricades, erosion control measures, and flashing safety lights would be common. Lights may be used to safely illuminate the workspaces during low light hours, which could cause spillover light onto adjacent properties; lights will be shielded appropriately and will be used only as necessary. Therefore, during the construction of this alternative, both neighbors and travelers could perceive that the visual quality of this AVE would be temporarily degraded. Visual detractions from construction activities would be removed upon completion of construction of the project.

Existing trees, brush, and vegetation currently obscure all but distant views of the highway that are outside of the construction limits. This vegetation will remain and visual conditions for both neighbors and travelers at the Cultural Site are not likely to change. Viewer preference for project coherence will be met; therefore, construction would be expected to have a neutral effect on visual quality during construction from the Cultural Site.

4.5.4 Visual Quality

Realigning the highway will move visual elements associated with the roadway and displace natural elements; however, the scale, size, type, and character of the roadway will be similar to that of the existing highway and most of the land and vegetation along the highway shoulders and existing ranchland is not in a natural condition. Landforms would not change as the proposed roadway would be placed at approximately the same elevation. The Pedestrian Shift Alternative would increase the size and scale of the roadway causing adverse visual impacts; however, revegetation and new planting areas would have a beneficial visual impact for neighbors and travelers. The overall visual impact will be neutral to the experience of natural harmony in the AVE.

The human environment would remain orderly as the project would not propose changes to structures, fencing, or other human-made elements; however, the highway would move away from the closest residential structures, and revegetation measures will likely improve visual conditions for those viewers. Improvements to the roadway would also reduce vehicle congestion and pedestrian conflicts. Visual coherence in the project environment would be improved and the overall impact on visual quality would be neutral to beneficial for both Highway and Cultural site neighbors and travelers durig daytime conditions.

Additional streetlights proposed with the Pedestrian Shift Alternative would improve safety and visibility for highway motorists and pedestrians during nighttime conditions but would increase the number of light sources and overall ambient light levels. Changes to nighttime conditions would be neutral to beneficial for most viewers; however, the Cultural Site is used at night for wayfinding and star navigation. These viewers would be sensitive to adverse impacts to the existing nighttime light conditions and would likely experience negative impacts to visual coherence; however, existing landforms, trees, and vegetation would primarily block or obscure most proposed light sources for viewers form the Cutural Site (see Figure 4-10. Photographic Simulation – Pedestrian Shift, Cultural Site at Nighttime). Additionally, light sources are prevalent in the existing nighttime environment, the number of viewers at the Cultural Site would be small, and the frequency of nighttime viewers would be limited. Mitigation measures to help reduce the effects of light and glare sources will help to reduce negative impacts for these viewers during nighttime conditions.

4.6 INDIRECT AND CUMULATIVE IMPACTS

Potential indirect impacts would occur when the project would result in additional changes later in time or farther in distance. Cumulative impacts on visual quality would occur when the project component's impact on visual quality is combined with other past, present, and foreseeable future actions. Indirect or cumulative impacts could be to the natural, human, or project environments.

4.6.1 No Build Alternative Indirect Impacts

Rising sea levels and coastal hazards, such as chronic erosion, seasonal wave overtopping, flooding, and storm surges will likely eventually degrade the existing roadway base and beach slopes. Additional efforts to stabilize the beach and roadway could cause visual and environmental degradation and could include visual impacts. Viewer exposure and awareness would likely change with any proposed relocation of the existing roadway.

4.6.2 No Build Settlement Alternative

Indirect impacts would be the same as the No Build Alternative.

4.6.3 TSM Alternative Indirect Impacts

Indirect impacts would be the same as the No Build Alternative.

4.6.4 Pedestrian Shift Alternative Indirect Impacts

The Pedestrian Shift Alternative is expected to stabilize the highway for a minimum of 15 to 20 years

CHAPTER 5
MITIGATION

This report includes the consideration of mitigation to help lessen the visual impacts of the project. Mitigation may be proposed to address direct impacts to maintain or enhance the existing visual quality. Mitigation measures are categorized into the following five areas, listed in order of preference:

1. Avoidance: Altogether avoiding adverse impacts by not taking a certain action or parts of an action. Avoidance may mean selecting alternatives that do not incur the impact or degree of adverse impact.
2. Minimization: Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectification: Repairing, rehabilitating, or restoring the affected environment.
4. Reduction: Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensation: Compensating for the impact by replacing or providing substitute resource or environments (FHWA 2015).

5.1 MITIGATION MEASURES FOR VISUAL IMPACTS

5.1.1 No Build Alternative

No mitigation measures would be proposed for the No Build Alternative.

5.1.2 No Build Settlement Alternative

Rectification measures:

- Disturbed land behind the proposed barrier would be seeded with native grasses. Mitigation measures could be revegetated native trees and shrubs to provide a more natural visual setting.

5.1.3 TSM Alternative

Rectification measures:

- Disturbed land behind the proposed guardrail would be seeded with native grasses. Mitigation measures could be revegetated native trees and shrubs to provide a more natural visual setting.

5.1.4 Pedestrian Shift Alternative

Avoidance measures:

- Proposed Roadway alignment may be adjusted to avoid large trees, native plantings, or visually pleasing features; particularly adjacent to the Lauhulu Stream riparian corridor.

Minimization measures:

- Shielding street lights to direct light to roadway surfaces, minimize light spill to surrounding areas, and minimize light and glare impacts, particularly where visible from the cultural site.

Rectification measures:

- Planting and revegetation are proposed for disturbed areas; however, additional plantings, particularly between residential viewers and the proposed roadway would provide additional screening.
- Opaque fencing and visual screening could be provided or expanded for adjacent residential and commercial viewers.
- Revegetation and plantings associated with the Laniakea Beach and Stream could be increased in size and density to provide a more natural setting.

5.1.5 Project Construction Considerations Regarding Visual Quality and Aesthetics

During the construction phase, the following actions would minimize temporary impacts on visual quality and aesthetics:

- Preserve existing vegetation and minimize clearing for storage and laydown areas. Utilizing existing hard /paved areas for project staging where practical.
- Limit construction to daylight hours whenever possible. Include directional work and safety lighting and direct lights away from residential areas where nighttime construction is necessary.
- Reduce temporary construction light and glare impacts by shielding and aiming light sources downward and toward work areas to avoid light spillover
- Screen views of construction equipment and materials from pedestrians and residential areas, as practical
- Restore landscaping disturbed by construction-related activities after completion of work.

CHAPTER 6
REFERENCES

FHWA. 2015. "Guidelines for the Visual Impact Assessment of Highway Projects." U.S. Department of Transportation Federal Highways Administration.

Appendix

I

FEMA's Firm Method Tsunami Runup Modeling

Laniakea Highway Relocation Inundation Analysis and Coastal Assessment – Task 1

FEMA's FIRM Method Tsunami Runup Modeling

North Shore, Oahu, Hawaii

March 2021

Prepared for:
WSP
1001 Bishop St., American Savings Bank
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Job No. 25743

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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1. INTRODUCTION

The Hawaii Department of Transportation (HDOT) is pursuing a proposal to realign a segment of Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the North Shore of Oahu, potentially relocating the roadway to a position further inland, in an effort to alleviate frequently congested traffic and mitigate hazardous pedestrian crossings along this stretch of road. As a part of that effort, Sea Engineering, Inc. (SEI) has been contracted to provide assistance for a number of coastal engineering related tasks, including tsunami (seismic or tidal wave) runup inundation analyses, storm wave runup and inundation analyses, as well as a general coastal assessment of the project site. Results from this work are prepared for inclusion in the eventual draft environmental assessment (EA) for the project.

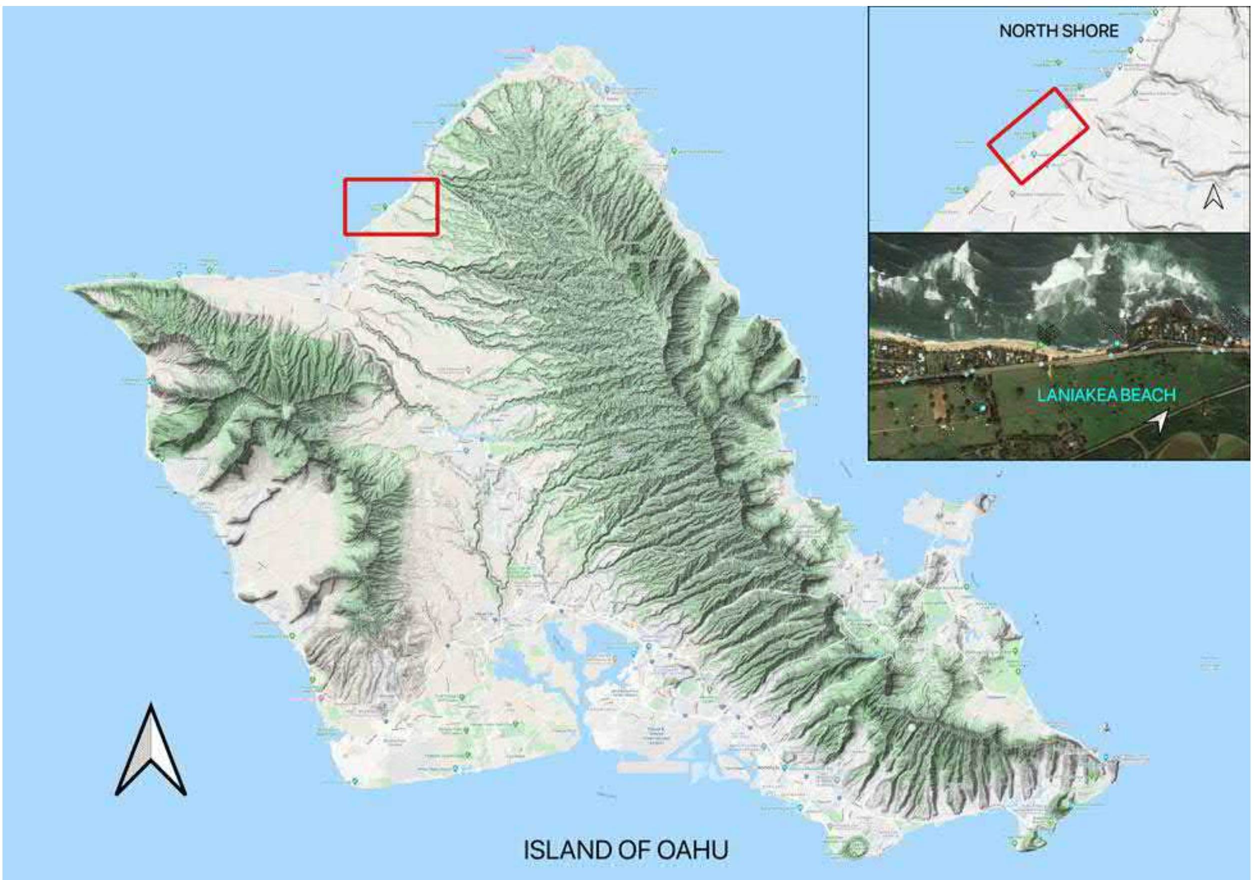

Figure 1-1. Project location map

This document summarizes the methodology, results and conclusions from a 1-dimensional model of tsunami runup along a series of shoreline transects in the project area, and what implications, if any, may result to the current runup profiles as a result of the proposed roadway realignments that have been provided. The project site is the section of road along Laniakea Beach, and surrounding vicinity, as shown in the project location map presented in Figure 1-1.

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2. METHODOLOGY & PROCEDURES

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), maintains flood hazard maps for use in determining a reference height used by property insurance companies to assess flood risk, known as the Base Flood Elevation (BFE). On the North Shore of Oahu, Hawaii, the 1% annual flood risk is considered by FEMA to be a result of tsunami wave inundation, and not from rainfall accumulation. The North Shore flood zones were determined in a 1979 study utilizing the method presented in the "Manual for Determining Tsunami Run-up Profiles on Coastal Areas in Hawaii", a U.S. Army Corps of Engineers (USACE) manual prepared by M&E Pacific, Inc.

SEI has applied this FEMA-recognized and accepted methodology here to calculate tsunami runup elevations along the Laniakea project site for existing ground conditions, along with two proposed highway relocation alternatives provided by WSP, where runup is defined by the United States Geological Survey (USGS) as, "…a measurement of the height of the water onshore observed above a reference sea level "—in this case, mean sea level (MSL). Existing calculations completed by FEMA are based on the same one-dimensional method, however, cross shore transects were spaced far apart (hundreds of meters) along the shoreline. The Flood Insurance Rate Maps (FIRMs) represent the inundation contours interpolated between these far-spaced calculated transects, as determined by floodplain engineers. By comparison, for this project, SEI has used tightly-spaced transects (40 m) along the shoreline to provide significantly higher resolution for the inundation results.

Aerial laser-based LiDAR (Light Detection And Ranging) elevation data were supplemented as necessary by beach and backshore profiles measured by SEI engineers. Run-up elevations for the proposed alternatives are compared to existing conditions to evaluate any changes. The process work flow is illustrated in Figure 2 1, and includes: acquisition of existing topographic and bathymetric LiDAR data sets; development of digital terrain models (DTMs) from the LiDAR data for existing ground conditions and for the proposed roadway modifications; slicing of the DTMs along cross shore transects, spaced at a 130 ft (40 m) interval to generate ground elevation profiles for the calculations; completion of the tsunami runup calculations along each of the profiles, for all of the ground conditions (existing, 2 alternatives); mapping of the runup results; and, comparison of the results.

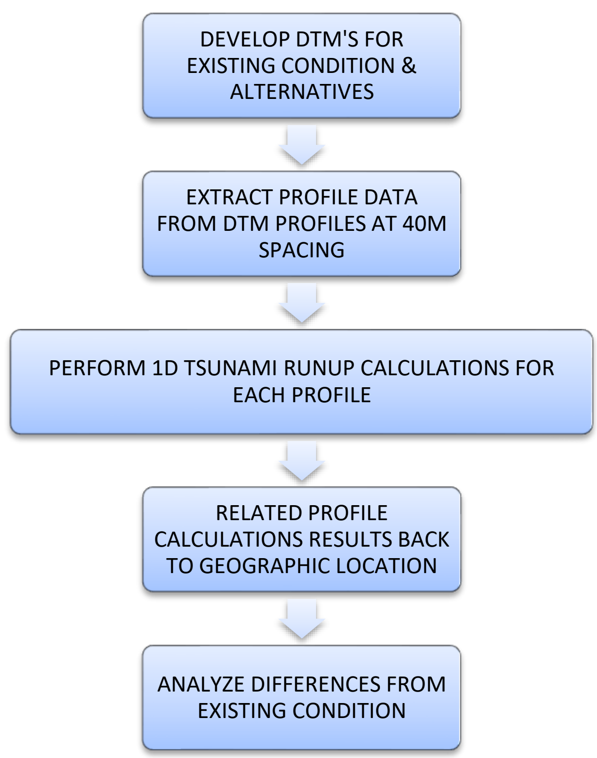

Figure 2-1. Modeling and analysis work-flow

A key input for the modeling analysis were the provided design data for the proposed ground elevation changes for each realignment alternative. The designs, provided to SEI as CAD-based surface data, clearly govern the runup ground elevation profiles upon which the calculations are based. It should also be noted that because the calculations are one-dimensional in nature, two-dimensional flow (e.g., flow components parallel to the shoreline) and impacts to the surrounding area were not directly evaluated. Additionally, tsunami runup incorporating sea level rise considerations were not addressed at this time.

The project site (Figure 1-1) is the section of Kamehameha Highway along the North Shore in the vicinity of Laniakea Beach; a map of the topographic and bathymetric contours for the project area overlaid on a hybrid satellite image, and additionally overlaid with a semi-transparent sun-shaded DTM relief image, is presented in Figure 2-2[1]. Prominent physical features in the vicinity of the project site are the shoreline, which transitions from a relatively wide sandy beach in the southwest of the project area, fronting the surf spot known as Laniakea's, then running northeast to a rugged basaltic rocky headland which fronts the surf spots known as Hultin's and Jocko's. The intersection between the sandy beach and the rocky point forms a relatively sheltered cove, where sea turtles are known to congregate in large numbers, drawing large crowds of tourists and visitors who come to see the protected marine animals. A small intermittent stream cuts a modest natural drainage channel from mauka to makai, running under the small bridge or culvert at the southwest end of Laniakea. The terrain slopes generally upward to the Koolau mountains from the highway until it reaches a steep-sided escarpment, the base of which is approximately 800 ft from the highway, beginning at roughly 60 ft above MSL. The makai area is heavily developed with private homes along the shoreline and highway and scattered with structures and farmland mauka of the highway. A sun-shaded relief map of the combined bathymetry (underwater terrain) and topography (bathy-topo) DTM is presented in Figure 2-3, more clearly illustrating the terrain of the project site. In this figure, ground elevation above MSL is indicated in feet by color using the provided color scale, where sea level is approximately yellow in color. The inundation calculations are based on a method that begins with an initial tsunami wave height for a location 200 ft inland from the shoreline; Figure 2-4 illustrates the location of a 200 ft shoreline buffer—calculations start at that location.

Figure 2-2. Project site with topographic contours labeled at 10 ft interval, with MSL in bold

[1] Full-sized prints of all significant figures are provided in Appendix A at the end of this document

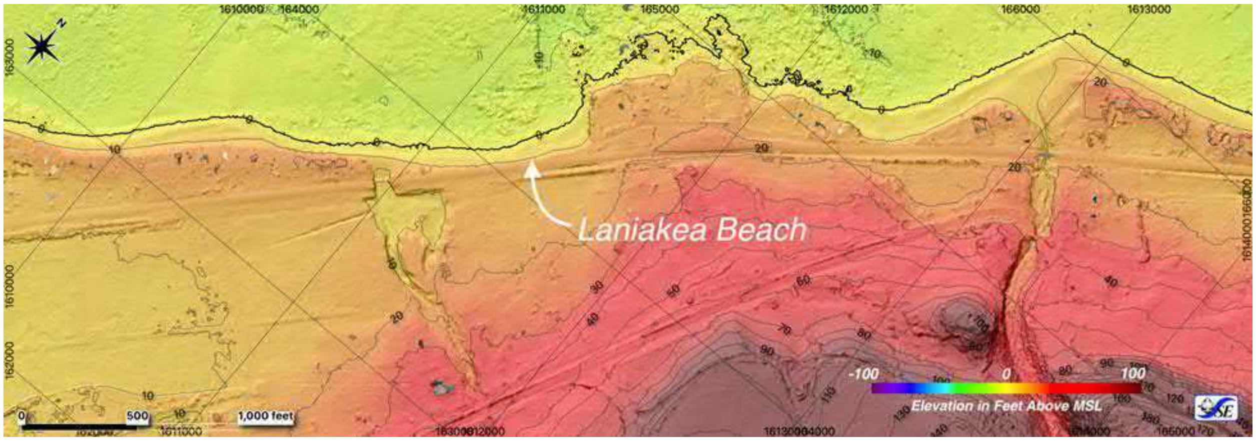

Figure 2-3. Color shaded DTM of project site, with topographic contours at 10ft interval

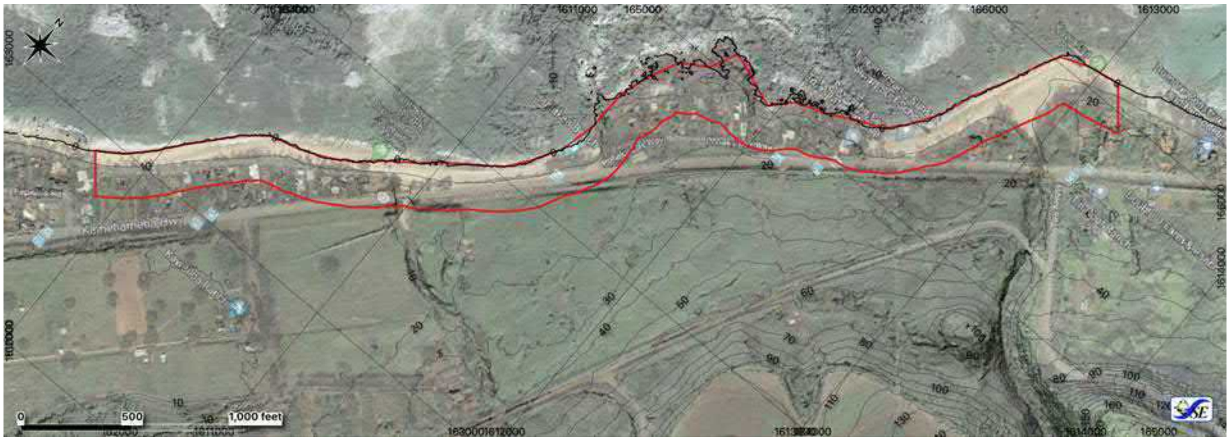

Figure 2-4. Laniakea shoreline buffer distance of 200 ft (red line)

Profile transects were developed at a 130 ft (40 m) spacing, to provide a reasonably high-resolution result, as illustrated in Figure 2-5, with a total of 35 individual profiles for the entire project area.

Figure 2-5. Runup transect locations at Laniakea

2.1 Tsunami Crest Height

The one-dimensional method for tsunami inundation utilized in this study is taken from the *Manual for Determining Tsunami Runup Profiles on Coastal Areas of Hawaii* (M & E Pacific, Inc., 1978). The empirical method begins with calculation of maximum tsunami crest height, in feet above MSL, at a location 200 ft inland from the shoreline, which was developed based on the ten largest recorded tsunamis occurring in Hawaii from 1837 through 1976. Predicted tsunami crest elevation is calculated using Equation 1 below:

$$H = -B - A \cdot log_{10}F$$ **Equation 1**. (*M&E Pacific, 1978*)

where, **H** = maximum elevation of tsunami crest above MSL, 200 ft inland of shoreline

F = frequency of occurrence; the FEMA FIRM analysis uses 100-year event, or 0.01

A, B = coefficients determined in the manual for locations along the shoreline of Oahu.

Referring to Plate 3 of the manual, which indicates numbered reporting stations for the site coefficients, it is seen that Laniakea is approximately 1/3rd of the way between points 10 and 11, as shown in Figure 2-6, which has rubber-sheeted Plate 3 over a conventional map of Oahu to accurately find the correct position of the project area.

Figure 2-6. Laniakea Beach (red pin) in relation to Plate 3 reporting stations *(M&E Pacific, 1978)*

Coefficients A and B for Laniakea are determined from Plates 21 and 24 in the manual (Figure 2-7 and Figure 2-8, respectively) by reading the charts and interpolating between the corresponding station numbers of 10 and 11. For coefficient A, approximately one-third of the way from 10 to 11, we find a value of 18 from Plate 21. Similarly, for coefficient B, we find a value of 13.5 from Plate 24.

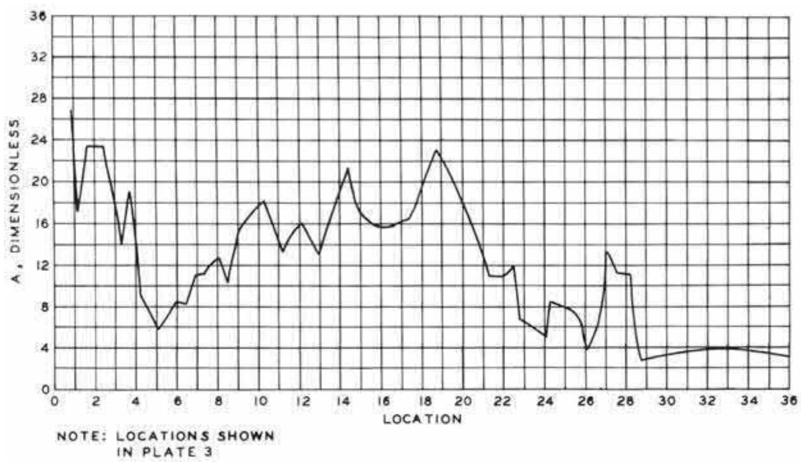

Figure 2-7. Plate 21, "Coefficient A vs Location" ***(M&E Pacific, 1978)***

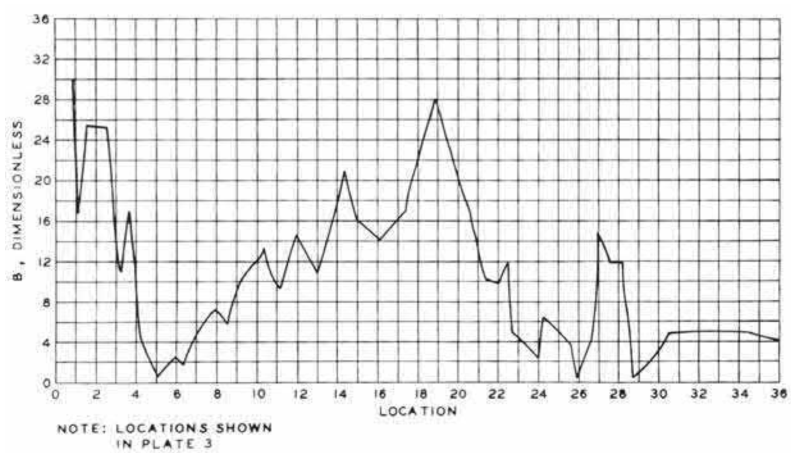

Figure 2-8. Plate 24, "Coefficient B vs Location" ***(M&E Pacific, 1978)***

Taking the values found for the coefficients A and B, and substituting them into Equation 1 using a 100-year event (F = 0.01), we find a maximum tsunami crest elevation above MSL at a location 200 ft inland of the shoreline at Laniakea:

$$H_{100} = -B - A \cdot log_{10}F = -13.5 - 18 \cdot log_{10}(0.01) = \underline{\text{22.5 ft above MSL.}}$$

This H_{100} value of 22.5 ft MSL is then used to initialize the tsunami calculation for every transect (e.g., the elevation of the inundation water surface above MSL for every transect shown in Figure 2-5 starts with a value of 22.5 ft at a location 200 ft inland along the transect). For the region between the shoreline and 200 ft inland (red polygon shown in Figure 2-4), the FIRM maps suggest that the H100 value is held constant through this area, and will be assumed as part of this method.

2.2 Tsunami Inundation Profile

The equation for tsunami elevation profile along the ground elevation profile is calculated by the differential equation for runup provided in Equation 2 of the manual:

$$\frac{dh}{dx} = -\left[\tan\theta + \frac{n^2 g F^2 h^{-\frac{1}{3}}}{1.486^2}\right]\left[\frac{F^2}{2} + 1\right]^{-1}$$

Equation 2. (*M&E Pacific, 1978*)

where, **h** = tsunami wave depth in feet

x = horizontal distance along profile in feet

tan θ = ratio of vertical rise in ground elevation over horizontal distance

n = Manning's friction factor, 0.035

g = gravitational acceleration (32.17 ft/s^2)

F = Froude Number (specified value of 1 for non-bore tsunami propagation mode)

The calculation commences by solving for the initial value of h, performed at the 200-foot x-coordinate of the transect by subtracting ground elevation from the H100 value. Note that, by definition, H100 is equivalent to the water surface elevation (WSE) at this specific coordinate of every transect. Using the existing condition tsunami WSE results for transect 3 (shown in Figure 2-9) as an example, we calculate:

$$h_{initial} = H_{100} - \text{elevation}_{(200ft)} = 22.5 - 18.2 = 4.3 \text{ ft}$$

Equation 2 is then directly solved for the quantity dh based on the initial tsunami wave depth, and then solved incrementally as a function of distance along each ground elevation profile as dx, in our case, completed in spreadsheet columns. This is done by re-writing Equation 2 in the form:

$$h_2 = -[x_2 - x_1]\left[\tan\theta + \frac{n^2 g F^2 h^{-\frac{1}{3}}}{1.486^2}\right]\left[\frac{F^2}{2} + 1\right]^{-1} + h_1 \quad \text{where, } \frac{\Delta h}{\Delta x} = \frac{h_2 - h_1}{x_2 - x_1}$$

The quantity dx can essentially be thought of as the resolution of the DTM (grid size), which in this case was approximately 3.9 ft. The maximum horizontal inundation distance is found when the wave height quantity reduces to zero ($h \rightarrow 0$), with some exceptions made for small localized obstructions. For example, the plot in Figure 2-9 illustrates the ground elevation profile in red and computed tsunami crest water surface elevation in blue, starting from 200 ft inland, where ground elevation directly beneath the tsunami WSE is highlighted by thick red, while the entire profile from the shoreline to 1,500 feet inland is light red for reference. The maximum inundation distance for this example is approximately 840 ft, however, it can also be seen that the WSE appears to first zero at a small obstruction near 780 ft, then continues to terminate at 840 ft. This is because, although the computations are one-dimensional in nature, reality is a three-dimensional environment, and if the ground elevation on either side of this profile is lower at this location, flowing water will be capable of filling the low area behind the small obstruction. For this reason, it is assumed in this study that if the slope of the WSE curve, such as illustrated by the dashed blue line in Figure 2 10, has not yet converged with the general slope of the ground profile such as that illustrated by the red dashed line, then water will be capable of filling the breach.

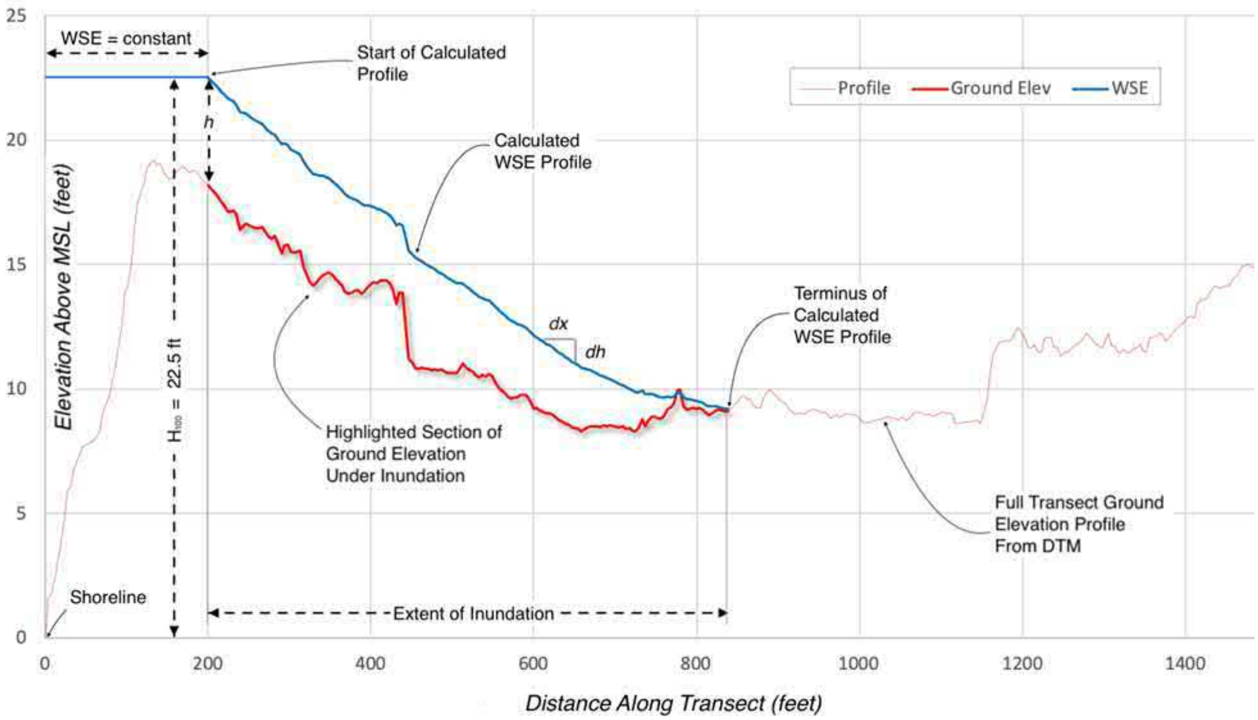

Figure 2-9. Annotated plot of tsunami inundation as a function of distance for transect 3

Figure 2-10. Convergence of tsunami WSE with ground profile along transect 3

2.3 Realignment Alternatives Configurations

The calculation method described above was followed for each transect shown in Figure 2 5, for the existing ground condition (Figure 2-2), and for the two provided realignment alternatives.

Alternative 1, referred to as the 'Pedestrian Shift Alternative,' is the least modified realignment alternative; it involves a limited shift of the road centerline mauka (landward) by approximately 80 ft for a length of nearly 1,700 ft centered on Laniakea Beach, as shown in Figure 2-11. The existing length of Kamehameha Highway remains in place, along with driveways for beach access and local resident traffic. Position of the proposed new roadway for Alternative 1, in relation to the established calculation transects, is shown in Figure 2-12.

Alternative 2, referred to as the 'Most Alignment Alternative,' is the more complex of the two modification options, with a proposed sweeping centerline shift of up to nearly 700 ft mauka, over a length of approximately 3,600 ft, starting southwest of the existing bridge at Laniakea and terminating just northeast of Chun's Reef (see Figure 2-13). The existing length of Kamehameha Highway also remains in place, along with new lanes for beach access and local resident traffic. Position of the proposed new roadway for Alternative 2, in relation to the established calculation transects, is presented in Figure 2-14.

Figure 2-11. Conceptual illustration of Kamehameha Hwy realignment Alternative 1 *(WSP, 2020)*

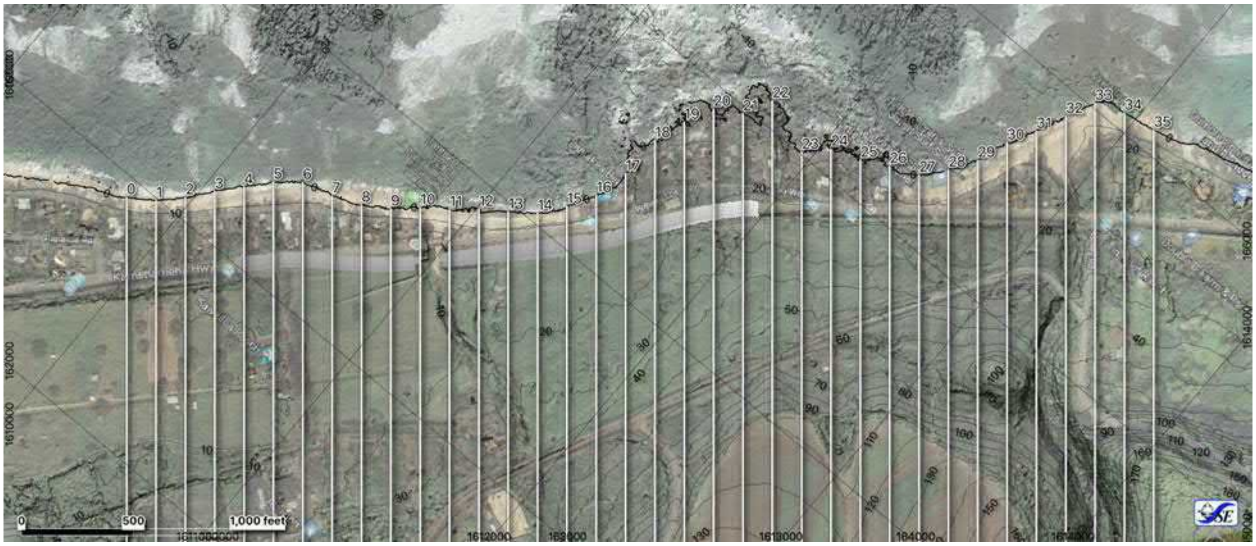

Figure 2-12. Realignment Alternative 1 incorporation into base DTM, shown with tsunami transects

Figure 2-13. Conceptual Illustration of Kamehameha Hwy realignment Alternative 2 *(WSP, 2020)*

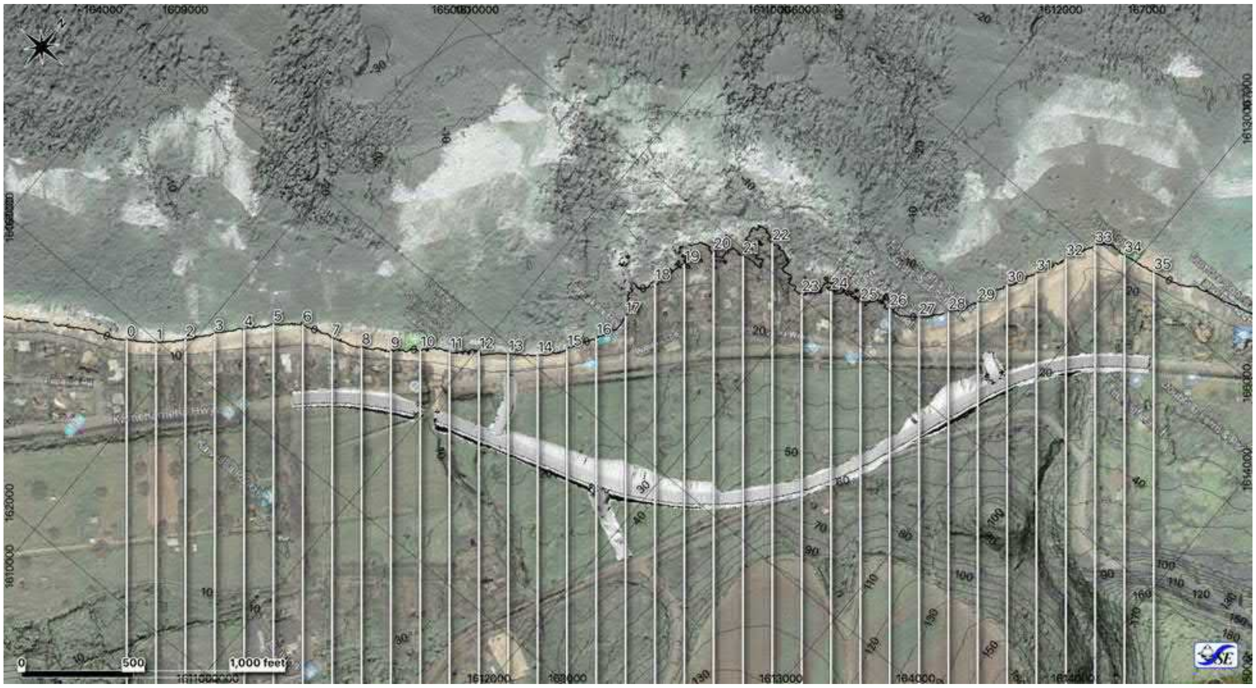

Figure 2-14. Realignment Alternative 2 incorporation into base DTM, shown with tsunami transects

3. RESULTS & DISCUSSION

Results of the calculations are presented in a series of plots showing ground elevation profile along with calculated tsunami crest water surface elevation, as illustrated by the example in Figure 2-9. There are 36 of these plots—one for each transect—for the existing condition. The entire collection of existing condition plots is provided in Appendix B. For the alternatives, only affected cross sections as shown in Figure 2-12 and Figure 2-14 are provided; there are 18 affected calculated transects for Alternative 1, and 29 affected transects for Alternative 2. All plots for both alternatives are also provided in the appendix.

3.1 Existing Condition

For the existing condition, data from the one-dimensional section plots were used to construct a geographic representation of the results by plotting the tsunami WSE curves as data points along their appropriate transects at their actual coordinate locations, and then gridding the entire data set of x-y-z values using a regularized spline tension (RST) algorithm to generate a surface that represents WSE for the entire area covered by the transects. The result is a surface that passes through (honoring) each data point while interpolating with a tension parameter in between transects. Contours of WSE at a one-foot interval are provided for visual reference, along with a continuous color ramp scale of elevation.

The maximum tsunami crest water surface elevation—the maximum height of the wave above mean sea level (a fixed vertical tidal datum)—is shown in Figure 3-1, where the region between the 200 ft inshore boundary and the shoreline is populated with values equivalent to the tsunami wave height at the inshore boundary. In other words, from the shoreline (0 MSL elevation contour) to 200 ft inland, the tsunami WSE is equivalent to H100 (22.5 ft). Contours of WSE at a one-foot interval are provided for reference, along with a continuous color ramp scale of WSE at lower right of the image.

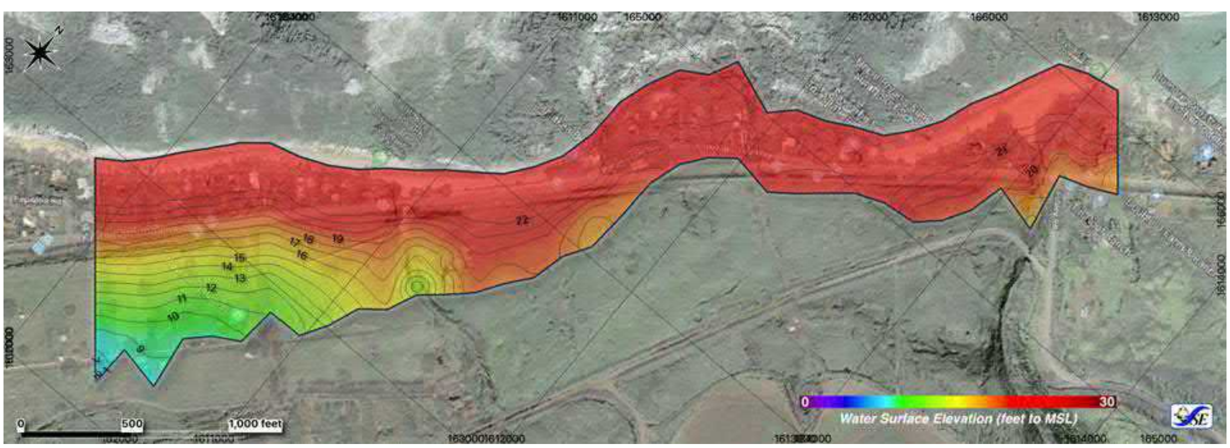

Figure 3-1. Gridded surface of tsunami crest WSE data for existing condition (WSE contours in feet)

Digitized layers representing FEMA's base flood elevation contours were obtained from the Hawaii Statewide GIS Program website (Flood Hazard Areas, 2020) as shapefile polygon data, and overlaid on the project base map, as presented in Figure 3 2. It is presumed that since the FIRMs used essentially the same method for the hazard zones VE (coastal high hazard areas subject to high waves and defined by the 100-year flood) and AE (combined zones also in the 100-

year flood limits), that the BFE contour values should be comparable to the calculated tsunami WSE values from this analysis.

The existing tsunami WSE data from Figure 3-1 were then overlaid on the FIRM data shown in Figure 3-2 to produce the comparison map displayed in Figure 3-3, where the thin black contours with dark black labels are for the existing WSE gridded surface, while the thick lines and black-with-white-outline labels represent FEMA's FIRM BFE data. The comparison suggests good general agreement over much of the area where there is overlap, with differences in elevation typically on the order of (± 2) feet. The only discrepancy of significance in the entire area of comparison appears to be a limited region of elevation deviation at the mauka end of transect 11, where the calculated tsunami elevation profile drops relatively quickly compared to the base flood elevation data or adjacent calculated profiles on either side. Examining the WSE contours at this location, as well as the transect plot in Figure 3-4, it appears that tsunami elevation drops down to approximately 12 ft. Neighboring transects (10 and 12) indicate a calculated WSE of approximately 16 ft, while the BFE is labeled as 18 ft for the same location, resulting in a maximum local deviation of 4 to 6 ft of water surface elevation here. However, a closer inspection of the terrain at this site (refer to Figure 2-5) reveals that the transect 11 alignment passes over an intermittent stream gulch at precisely this location, resulting in the relatively lower calculated WSE. The difference here is due to the higher resolution of the present study, which is able to resolve the gulch elevation, while the BFE interpolates across it. Aside from the above noted discrepancy, the calculated data and BFE values compare well.

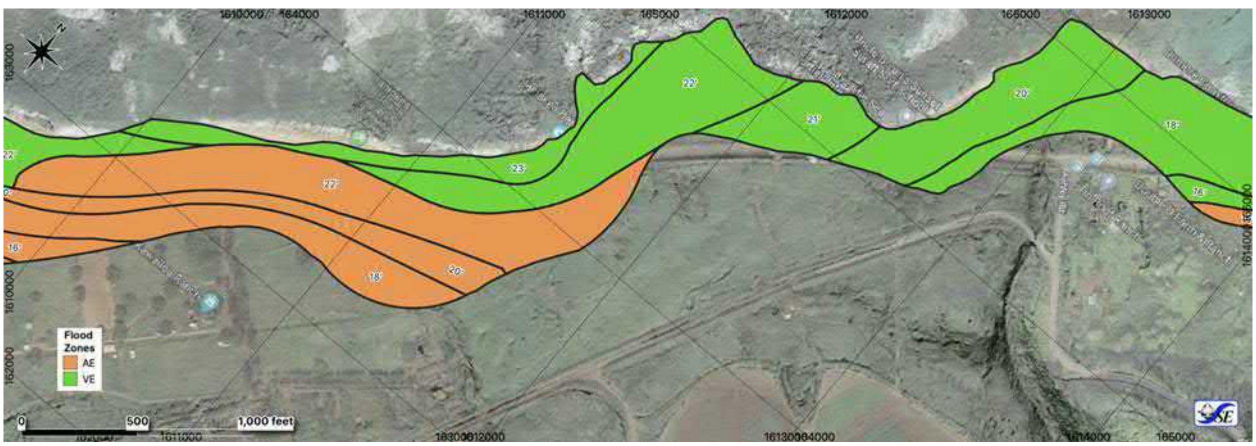

Figure 3-2. FEMA BFE contours extracted from statewide DFIRM website

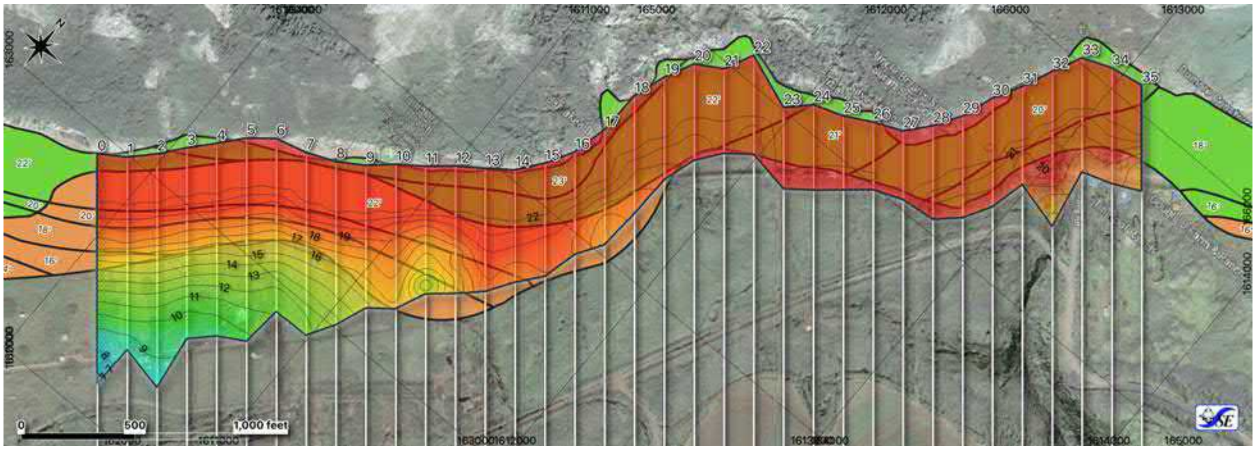

Figure 3-3. Comparison of calculated tsunami WSE with FIRM BFE contours

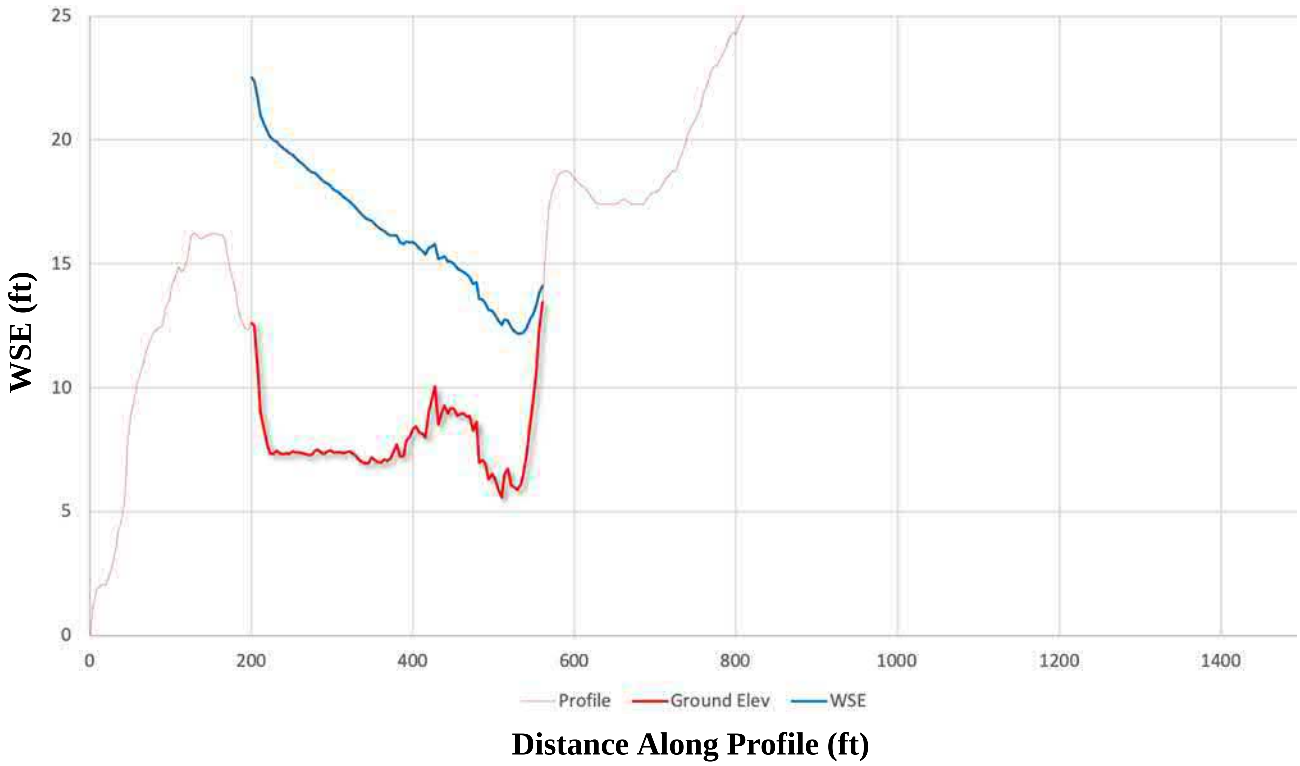

Figure 3-4. Plot of calculated tsunami WSE with associated DTM ground elevation profile

3.2 Alternative 1

In the same manner as that performed for the existing condition in the preceding section, a gridded surface of WSE was produced for Alternative 1, as shown in Figure 3-5. The results for Alternative 1 appear quite similar to those for the existing case, except for a limited region of marginal difference, primarily in the vicinity of the aforementioned stream gulch crossing, as well as the adjacent realigned roadway. The WSE plot of Alternative 1 for transect 11 (shown in Figure 3-6) is illustrative of the magnitude of difference generally experienced by this area, where the solid blue curve represents the tsunami runup elevation for Alternative 1, while the dashed blue curve is that for the existing condition, provided for reference. The plot indicates a slight increase of runup elevation on the order of a foot directly over the road deck (200’ < x < 250’), and a larger area of lower runup elevation—on the order of less than a foot—mauka of the road deck (250’ < x < 550’).

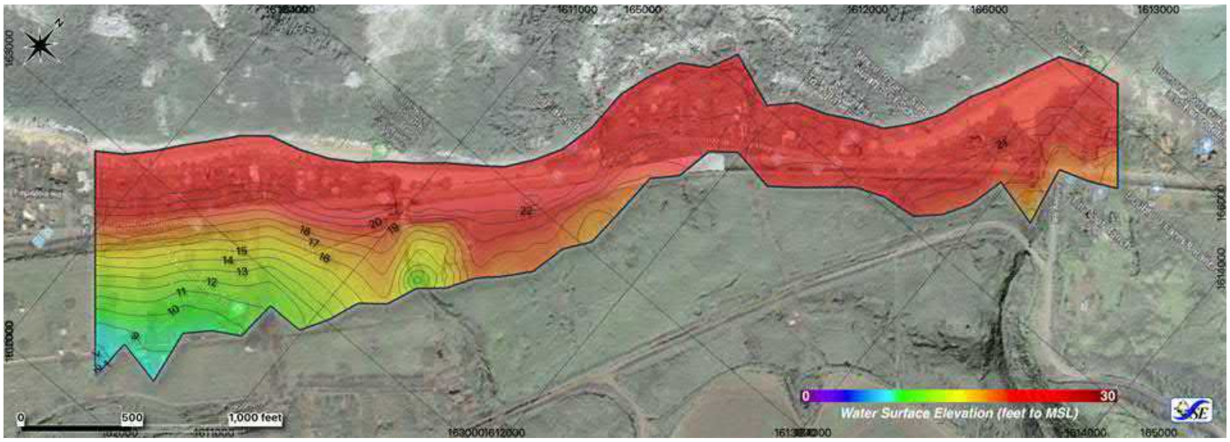

Figure 3-5. Gridded surface of tsunami crest WSE data for Alternative 1 (WSE contours in feet)

To reveal changes in tsunami runup due to modifications of the ground profile associated with Alternative 1 versus the existing case, a surface subtraction operation was utilized to subtract the existing condition results from Alternative 1, resulting in the difference map illustrated in Figure 3-7. In the this figure, for this particular order of subtraction [Alternative 1 – existing], negative values (darker blue color) indicate a relative drop in tsunami WSE or lowering of water depth compared to the existing condition, as shown in Figure 3-6; while increasing shades of red color, representing positive values, indicate a net increase in WSE compared to the existing condition. It can be seen in the figure that a visible area of WSE increase—by approximately 1 ft—appears over the new road deck on the northeast side of the bridge, along with an even shallower area of increase (less than 1 ft) located approximately 500 ft further down the new road alignment in the northbound direction. The maximum value for increase in WSE is approximately 1.4 feet, which is located at the center of the area that was identified adjacent to the bridge. Both of the identified areas of WSE increase (reddish hue) appear in general to be limited in depth and breadth, and to not appear to be located adjacent to any inhabitable structures. A comparatively wider area of relative decrease in WSE (bluish hue) is found along the mauka side of the new alignment, stretching from the stream gulch in the south and spanning northeastward for a length of approximately 600 to 700 ft, with an inland reach of approximately 400 ft. The bulk of this change is found along transect 12, as illustrated by the associated profile plot in
Figure 3-8.

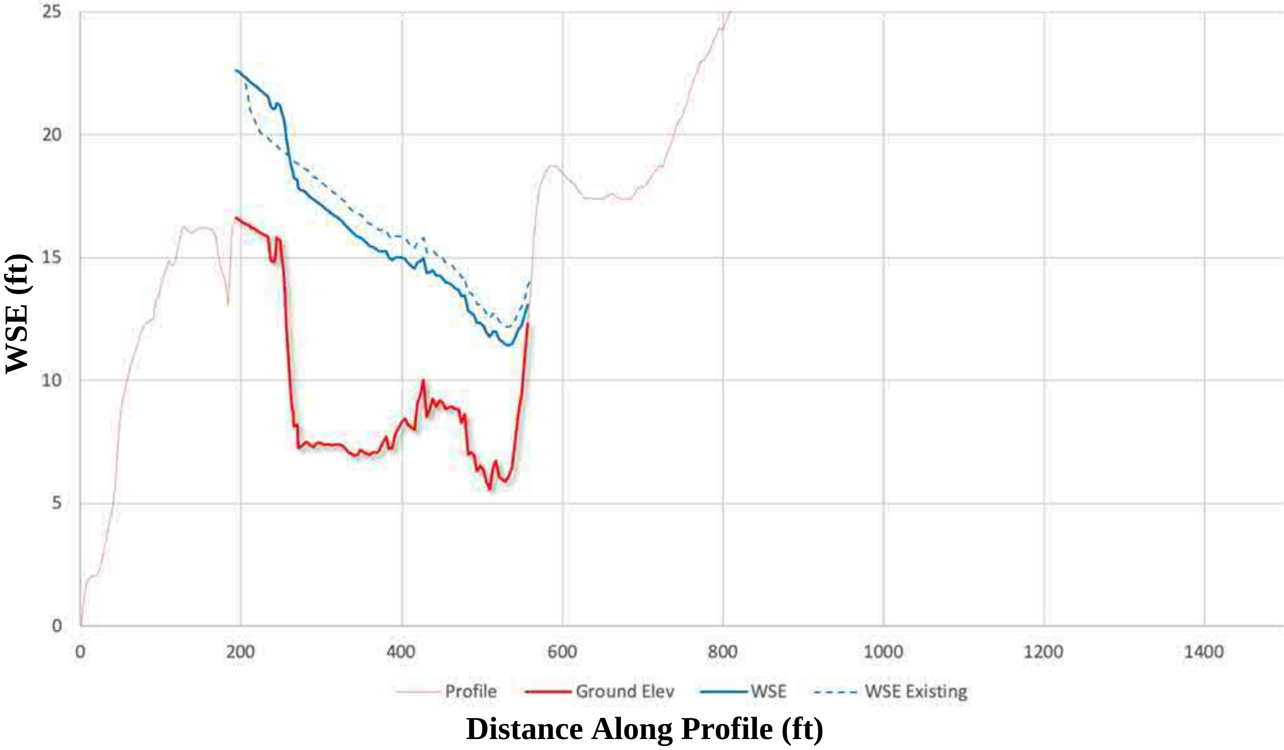

Figure 3-6. Transect 11, showing WSE profile for Alternative 1 (solid blue) with existing WSE (dashed)

The maximum inland extent of inundation was found to increase significantly at only one location, transect 20, which runs through the rocky headland bounding Laniakea Beach to the northeast. At this location, the northern end of Alternative 1's roadway alignment rejoins the original highway, and the calculated horizontal inundation distance increases by approximately 82 feet inland. The associated WSE plot for transect 20, shown in Figure 3-9, reveals the source of this increase—a high spot in the existing ground elevation profile (400' < x < 500') has been graded over, reducing its elevation by approximately one foot to accommodate the roadway, and subsequently allowing an increase in tsunami inundation distance based on the new lower profile. It is noted that for Figure 3-9, the WSE curves for the existing condition and Alternative 1 are coincident for the range (200' < x < 420').

Figure 3-7. Difference map of tsunami WSE [Alternative 1 - Existing] (WSE contours in feet)

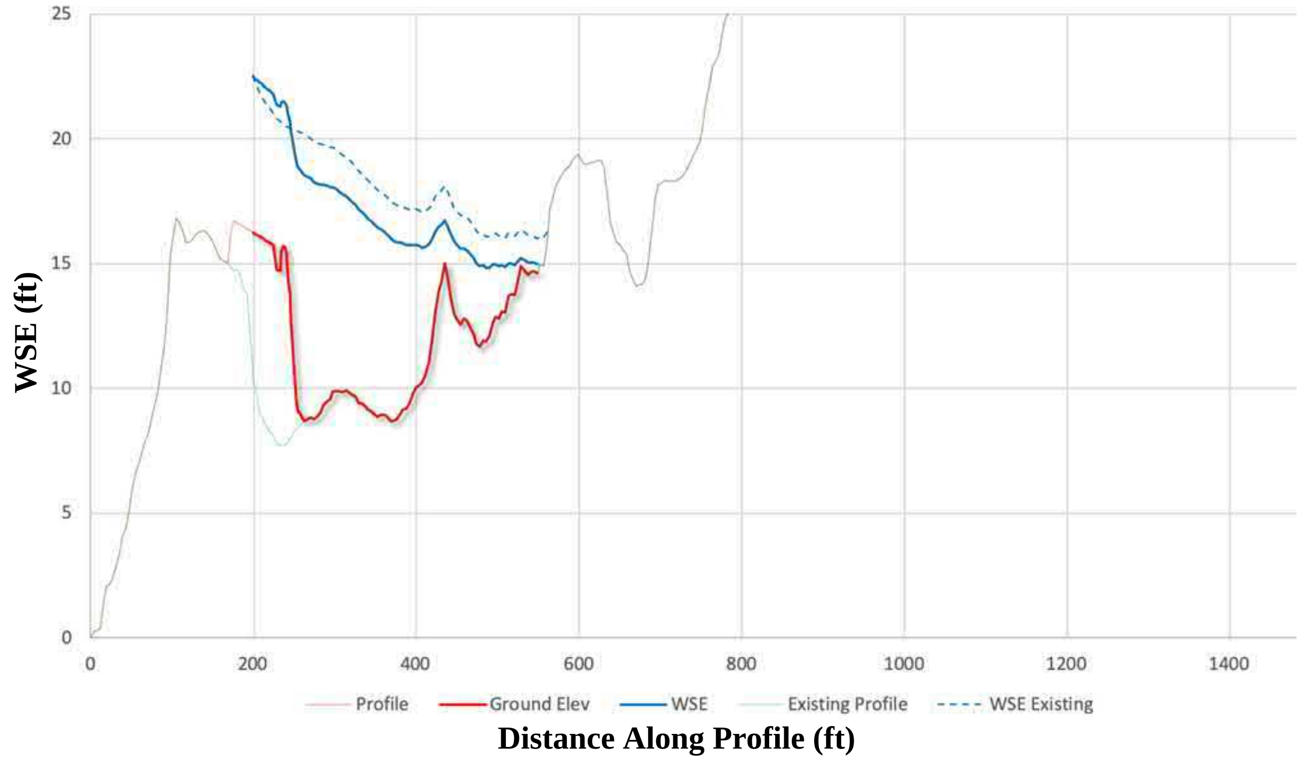

Figure 3-8. Transect 12, showing WSE profile for Alternative 1 (solid blue) with existing WSE (dashed)

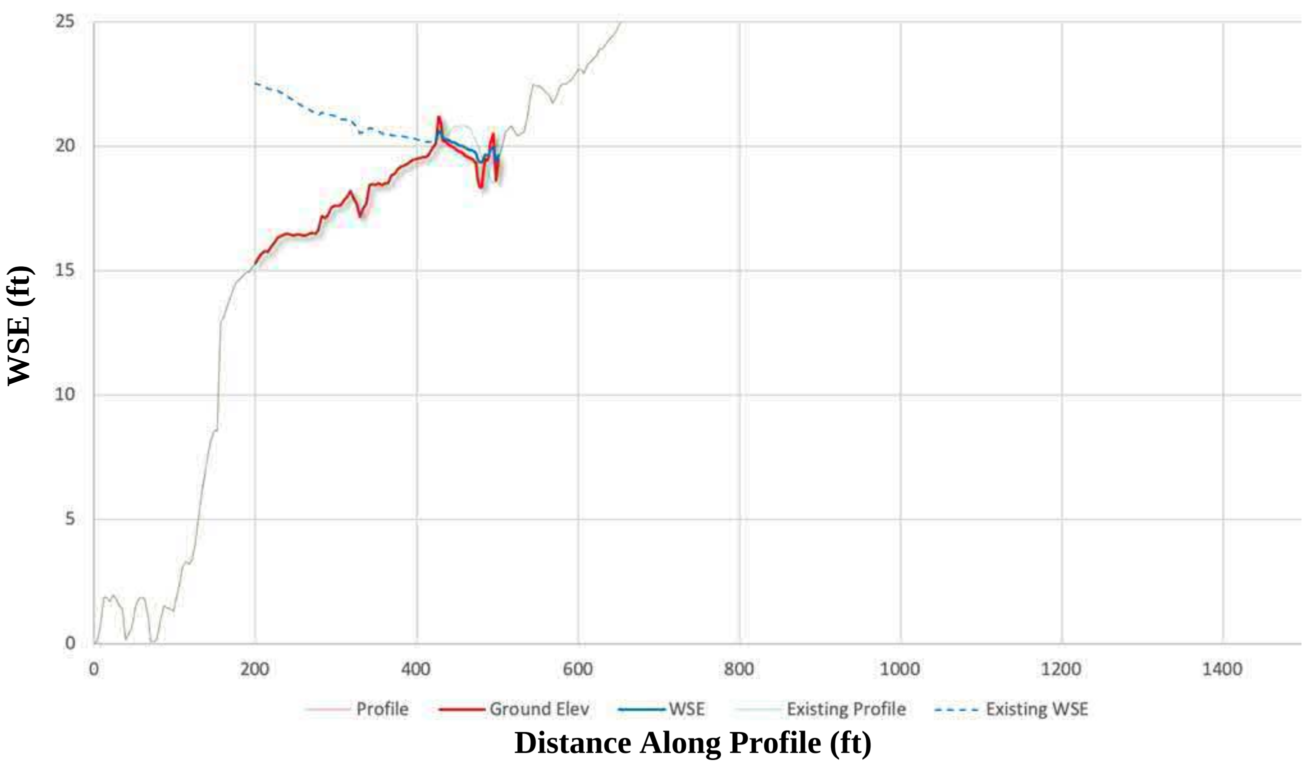

Figure 3-9. Transect 20, showing WSE profile for Alternative 1 (solid blue) with existing WSE (dashed)

3.3 Alternative 2

Replicating the method of the previous two sections, for the existing case and Alternative 2, a gridded surface of WSE was likewise produced for Alternative 2 and presented in Figure 3-10. Similar to Alternative 1, results for Alternative 2 are also generally quite comparable to the existing condition, with some limited areas of discrepancy.

Using the surface subtraction method presented in the previous section, a difference map [Alternative 2 – existing] for Alternative 2 reveals four notable areas of change, as shown in Figure 3-11. The most significant area of change is located near the southwest end of Laniakea Beach, where the proposed road realignment begins to split off from the existing alignment. The profile plot of transect 11, presented in Figure 3-12 reveals an increase in magnitude of calculated WSE of nearly 5 feet over the new road deck (200' < x < 400'). From Figure 3-11, it can be seen that this zone of significantly increased WSE appears to span approximately from transect 9 to 13, centered on the proposed new road alignment, and reaching approximately 200 ft to 300 ft inland; although mauka of the roadway, the level of increase is much smaller and is on the order of one foot. A small area of WSE relative reduction appears mauka of the roadway, at the southern end of the new alignment, lowering WSE values by approximately half a foot. Two additional, however less notable, areas of WSE increase are found elsewhere; one on the makai side of the northern alignment merge in the vicinity of transects 28 and 29, and another spanning the roadway makai-to-mauka as it crosses the stream gulch near Chun's Reef, at the northern end of the proposed realignment in the vicinity of transect 32—both regions exhibiting a relative maximum increase of approximately one-to-two feet (Figure 3-12). None of the significant areas of change identified above appear to be directly over or adjacent to inhabitable structures, except for the northernmost area, identified near transect 32, which appears to be approximately 100 ft mauka of a private residence near Chun's Reef.

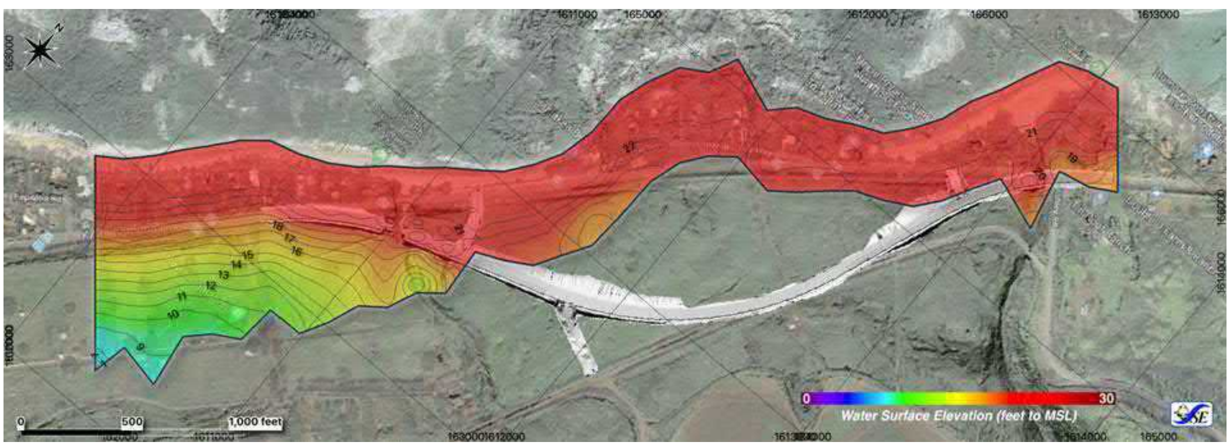

Figure 3-10. Gridded surface of tsunami crest WSE data for Alternative 2 (WSE contours in feet)

Figure 3-11. Difference map of tsunami WSE [Alternative 2 - Existing] (WSE contours in feet)

The calculated results for Alternative 2 revealed some noteworthy decreases in horizontal inundation distance, particularly at transects 13 through 15, and also at transects 28 through 31, located at the south and north ends of the proposed realignment, respectively. For example, the WSE plot for transect 13 shown in Figure 3-14 illustrates the substantial increase in grade—greater than 5 ft in height from the existing condition—for the new roadway and supportive embankment (350 < x < 450 ft inland), which together appear to block further landward propagation of the tsunami wave. According to the calculations, maximum horizontal inundation extent is reduced by approximately 173 ft at this location. Neighboring adjacent transects show reductions ranging from 46 to 95 ft.

Likewise, the WSE plot for transect 30 at the northern end of the proposed realignment, presented in Figure 3-15, also indicates a sizeable rise in grade due to the proposed roadway and associated earthworks (400 < x < 500 ft inland), suggesting that the structures act to block further propagation of the tsunami beyond its seaward-facing flank, located at approximately 400 ft inland. Compared to the existing condition, horizontal inundation extent is reduced by approximately 85 ft at this location. Nearby adjacent transects similarly show declines in inundation extent, ranging from 31 to 79 ft of reduction.

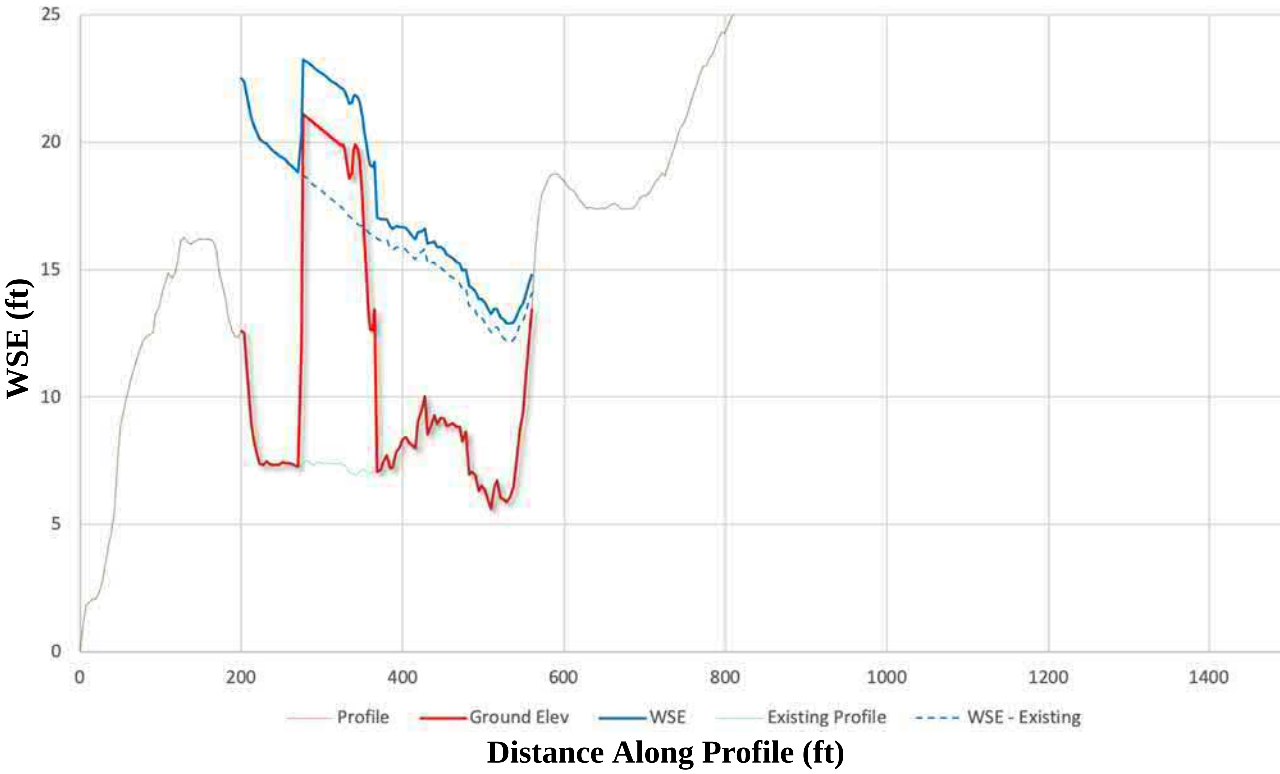

Figure 3-12. Transect 11, showing WSE profile for Alternative 2 (solid blue) with existing WSE (dashed)

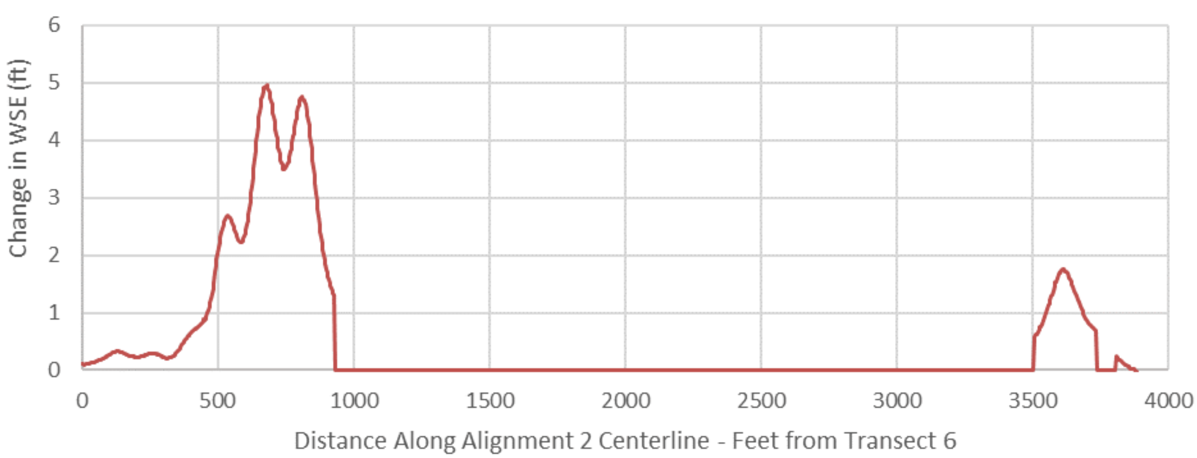

Figure 3-13. Profile of WSE change over Alt. 2 centerline, from transect 6 to 34

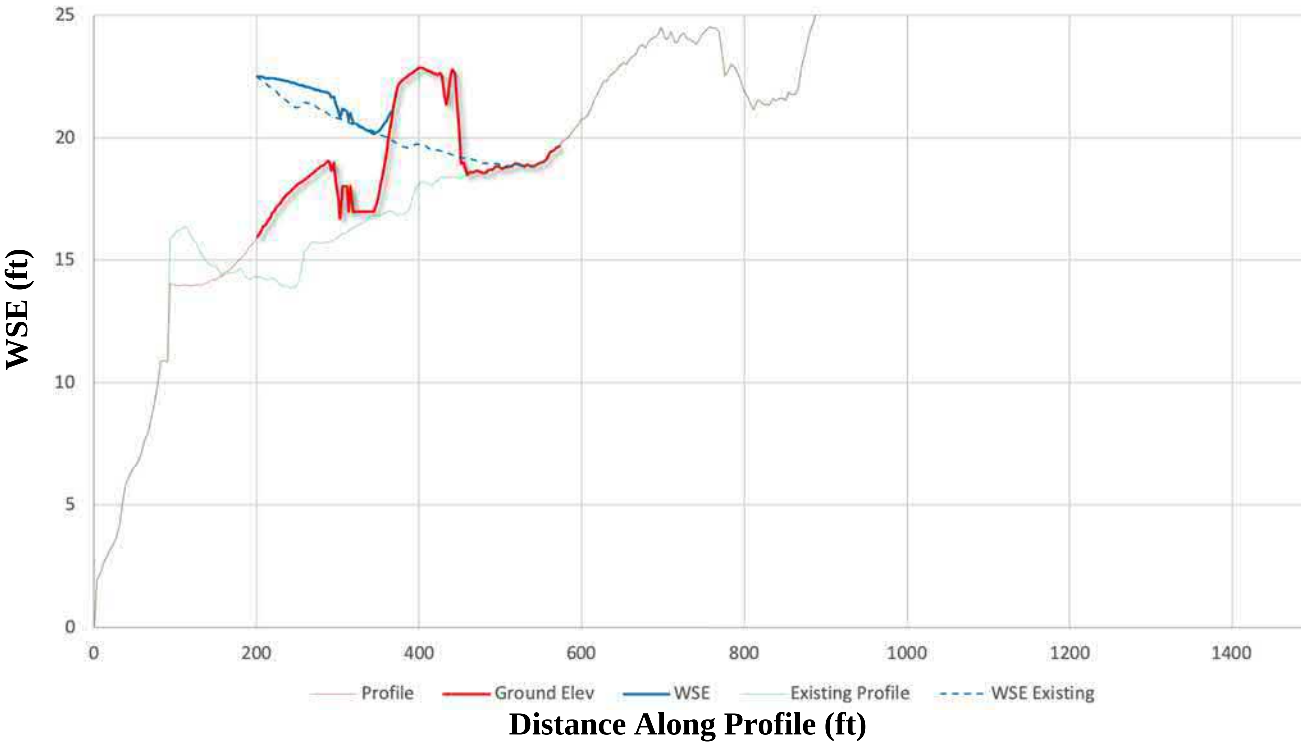

Figure 3-14. Transect 13, showing WSE profile for Alternative 2 (solid blue) with existing WSE (dashed)

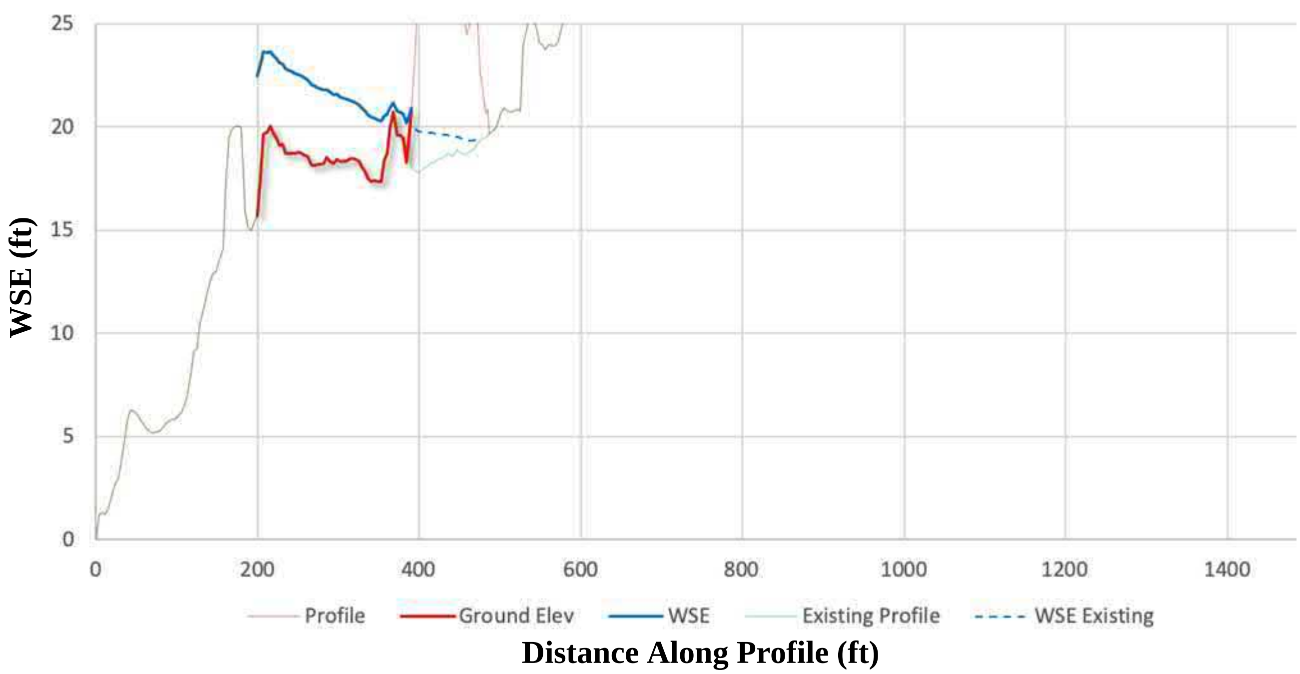

Figure 3-15. Transect 30, showing WSE profile for Alternative 2 (solid blue) with existing WSE (dashed)

3.4 Summary

The maximum horizontal inundation distances for each transect, including for the existing condition and each alternative, is provided in Table 3-1. Calculated Tsunami Horizontal Inundation Distances (all units in feet). Based on the results in the table, change in maximum inland inundation from the existing condition is illustrated graphically by the bar plot in Figure 3-16, where a positive quantity indicates an increase in inland inundation distance along the transect while a negative quantity signals a reduction in inundation distance from existing conditions. The results in Figure 3-16 indicate that tsunami inundation distances are increased significantly at only one location (transect 20), by approximately 80 ft, and for only one of the alternatives (Alternative 1).

The increase in inundation distance at this location can be linked directly to the removal or grading over of an existing high spot the ground elevation profile necessary to construct the proposed road realignment. Calculations show that removal of this high spot allows the tsunami to propagate approximately an additional 80 feet. Otherwise, it appears that Alternative 2 may actually mitigate—to a limited degree—existing horizontal inundation limits at a handful of locations, including the aforementioned transects 13 through 15 and transects 28 through 31. The trade-off however, for Alternative 2's reduction of horizontal inundation distances, is the higher tsunami crest water level elevation (or WSE) levels revealed at the north and south ends of the proposed roadway, as discussed in Section 3.3.

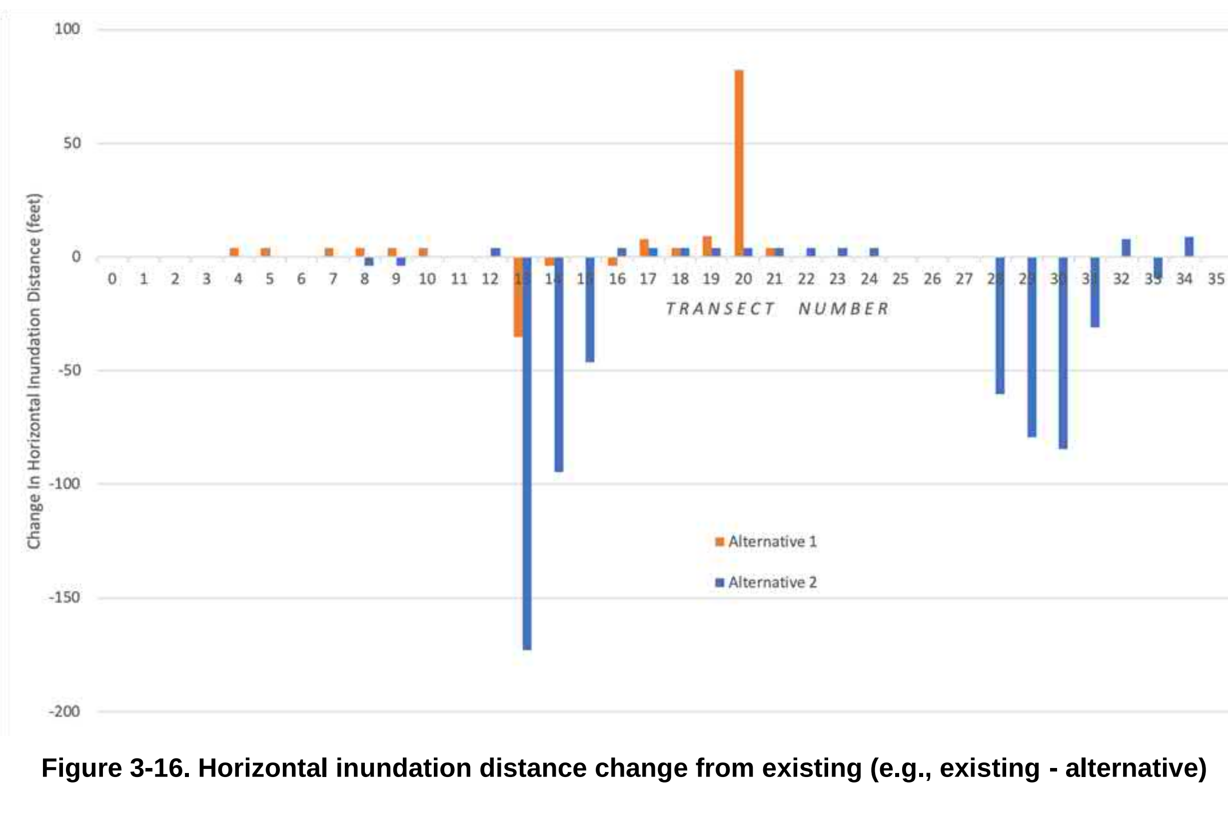

Figure 3-16. Horizontal inundation distance change from existing (e.g., existing - alternative)

Table 3-1. Calculated Tsunami Horizontal Inundation Distances (all units in feet)

Transect Number	Existing Condition	Realignment Alternative 1	Realignment Alternative 2	Δ Existing - Alternative 1	Δ Existing - Alternative 2
0	964.26	964.26	964.26	0.00	0.00
1	846.67	846.67	846.67	0.00	0.00
2	1,026.97	1,026.97	1,026.97	0.00	0.00
3	838.83	838.83	838.83	0.00	0.00
4	846.67	850.59	846.67	3.92	0.00
5	893.70	897.62	893.70	3.92	0.00
6	760.43	760.43	760.43	0.00	0.00
7	803.55	807.47	803.55	3.92	0.00
8	717.31	721.23	713.39	3.92	-3.92
9	627.16	631.08	623.24	3.92	-3.92
10	635.00	638.92	635.00	3.92	0.00
11	560.52	560.52	560.52	0.00	0.00
12	560.52	560.52	564.44	0.00	3.92
13	540.93	505.65	368.02	-35.28	-172.91
14	493.89	489.97	399.34	-3.92	-94.55
15	497.81	497.81	451.54	0.00	-46.27
16	450.77	446.85	454.69	-3.92	3.92
17	505.65	513.49	509.57	7.84	3.92
18	517.41	521.33	521.33	3.92	3.92
19	450.77	459.75	454.69	8.98	3.92
20	423.33	505.65	427.25	82.31	3.92
21	372.38	376.30	376.30	3.92	3.92
22	435.09	435.09	439.01	0.00	3.92
23	356.70	356.70	360.62	0.00	3.92
24	376.30	376.30	380.22	0.00	3.92
25	325.34	325.34	325.34	0.00	0.00
26	297.90	297.90	297.90	0.00	0.00
27	301.82	301.82	301.82	0.00	0.00
28	411.57	411.57	351.05	0.00	-60.52
29	446.85	446.85	367.45	0.00	-79.40
30	478.21	478.21	393.70	0.00	-84.51
31	431.17	431.17	400.26	0.00	-30.91
32	682.04	682.04	689.88	0.00	7.84
33	501.73	501.73	492.12	0.00	-9.60
34	509.57	509.57	518.37	0.00	8.80
35	466.45	466.45	466.45	0.00	0.00

In summary, results from the one-dimensional modeling for the existing condition compare well with FEMA's FIRM maps and BFE contours. Results also suggest that both realignment alternatives may have the capacity for trapping the tsunami in limited areas due to the barrier effect of the elevated road decks, potentially causing a localized increase (compared to existing) of tsunami water surface elevation levels on the order of 2 to 5 ft adjacent to or over the proposed new roadways. However, it also appears that the proposed realignment options—alternative 2 in particular—may have the ability to reduce the extent of maximum inland inundation, in some locations reduced on the order of 100 to 200 feet.

In conclusion, results of the 1-D tsunami modeling show that predicted inland inundation distances are affected significantly only by Alternative 1, and only at one of the 35 total calculation transects (Transect 18). Inundation distance at this location is increased by approximately 80 ft compared to the existing condition. There are no apparent habitable structures mauka of Kamehameha Highway along this transect, nor along the transects on either side of it, that could be affected by this predicted increase in inundation (based on current aerial images used in this study). Alternative 2 shows no significant increases in inundation distances, and actually appears to shorten existing inundation distances along several transects, likely due to the built-up ground elevation from berms and a raised highway corridor of this alternative. The FEMA method (See Section 2.1) of tsunami crest elevation calculation utilized by this study starts, by definition, at a location 200 ft inland from the shoreline, as illustrated in Figure 2-4 and Figure 2-9. For the region between the shoreline and 200 ft inland, the FIRM maps suggest the tsunami elevation is held constant. As shown in Figure 2-4, the vast majority of homes included in the study area lie within (i.e., seaward of) this offset, and are therefore within the area assumed not to change in this method and not included in inundation equation. In order to investigate the effects on tsunami crest elevation throughout the regional area incorporating the details of the topography, a more sophisticated modeling approach would be required. Advanced modeling methods, such as the use of computational fluid dynamics (CFD), which are capable of capturing the complex flow field and hydrodynamic processes, would be needed to quantify changing water surface elevations due to complicated environments.

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APPENDIX A

FULL-SIZED FIGURES

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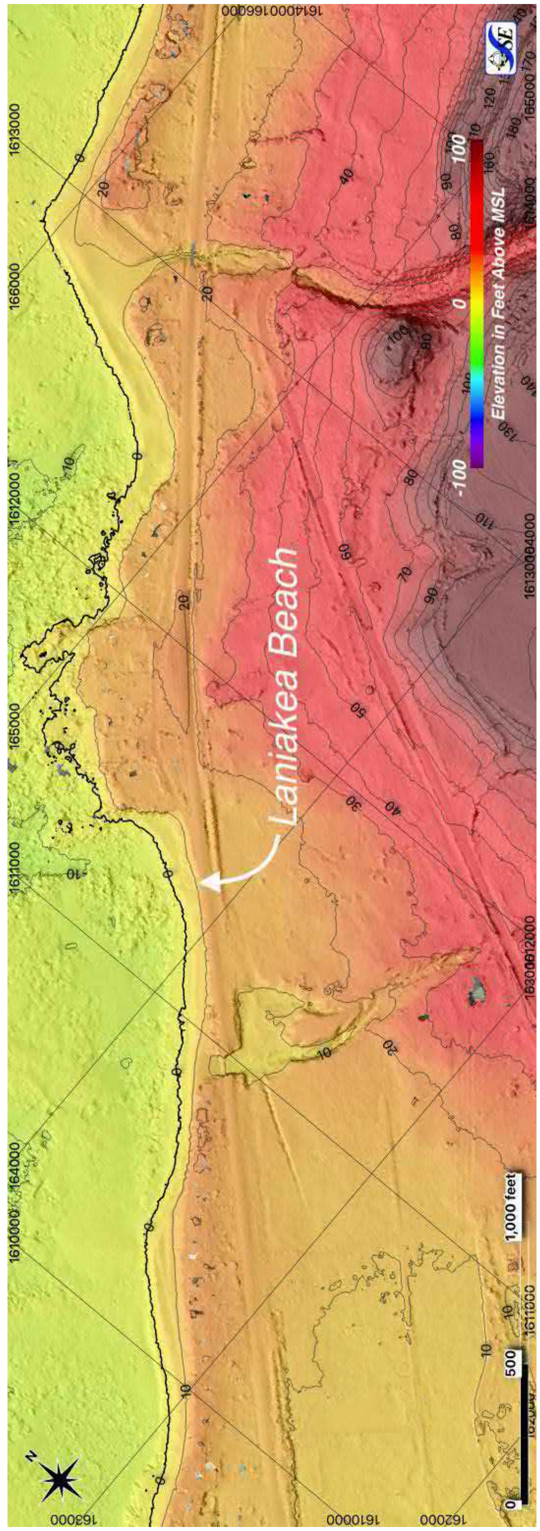
Figure 2-2



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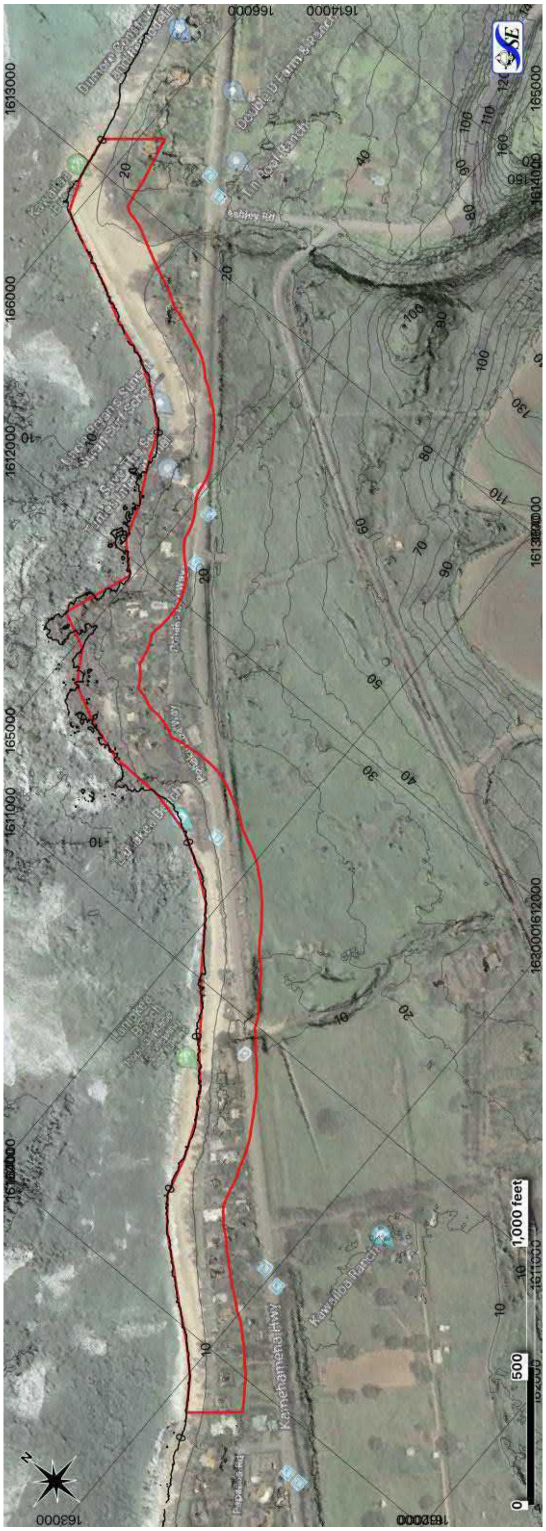

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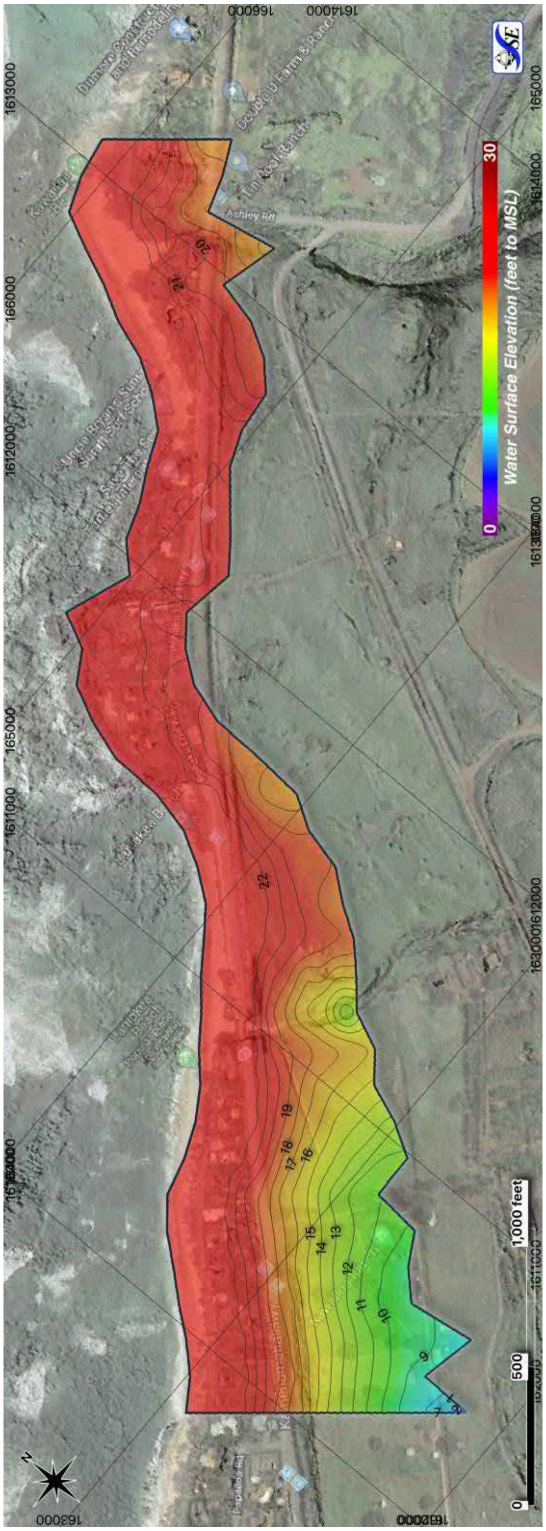
Figure 2-5



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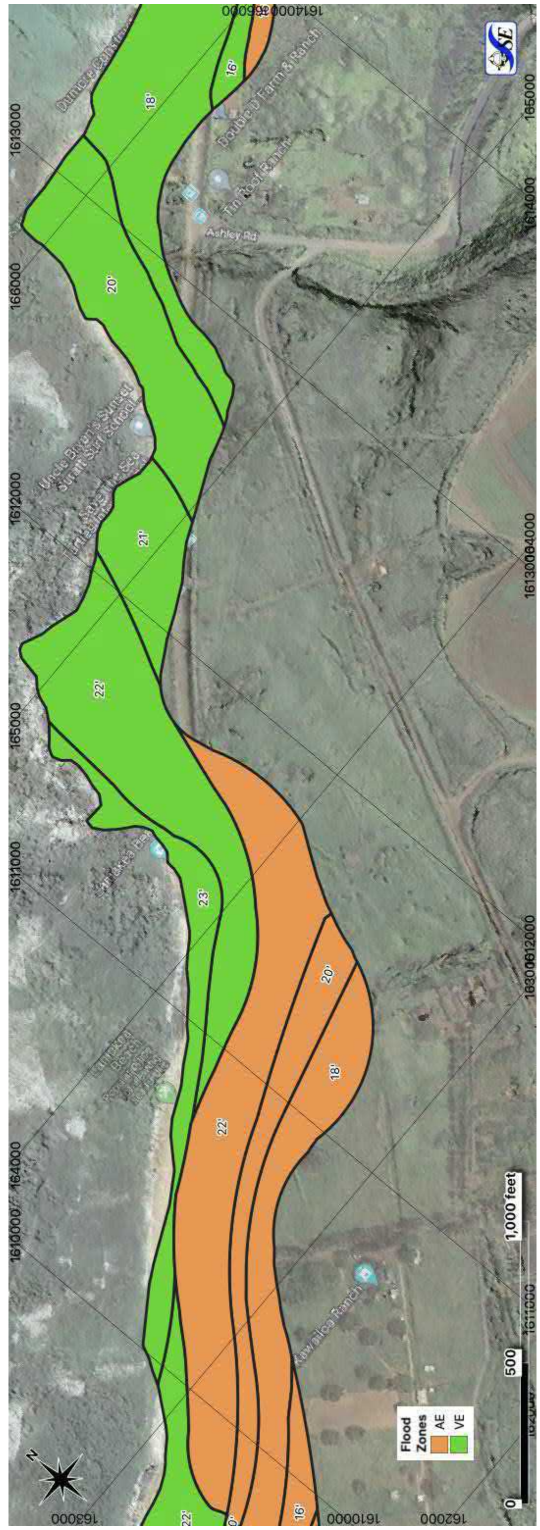

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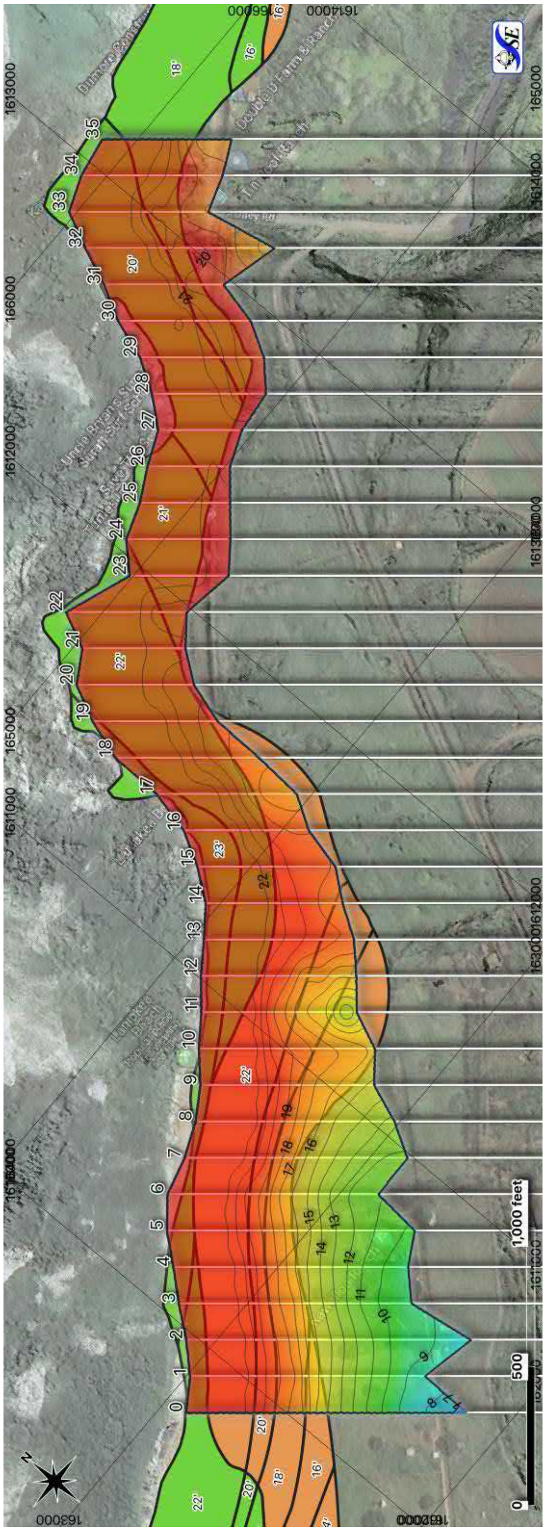

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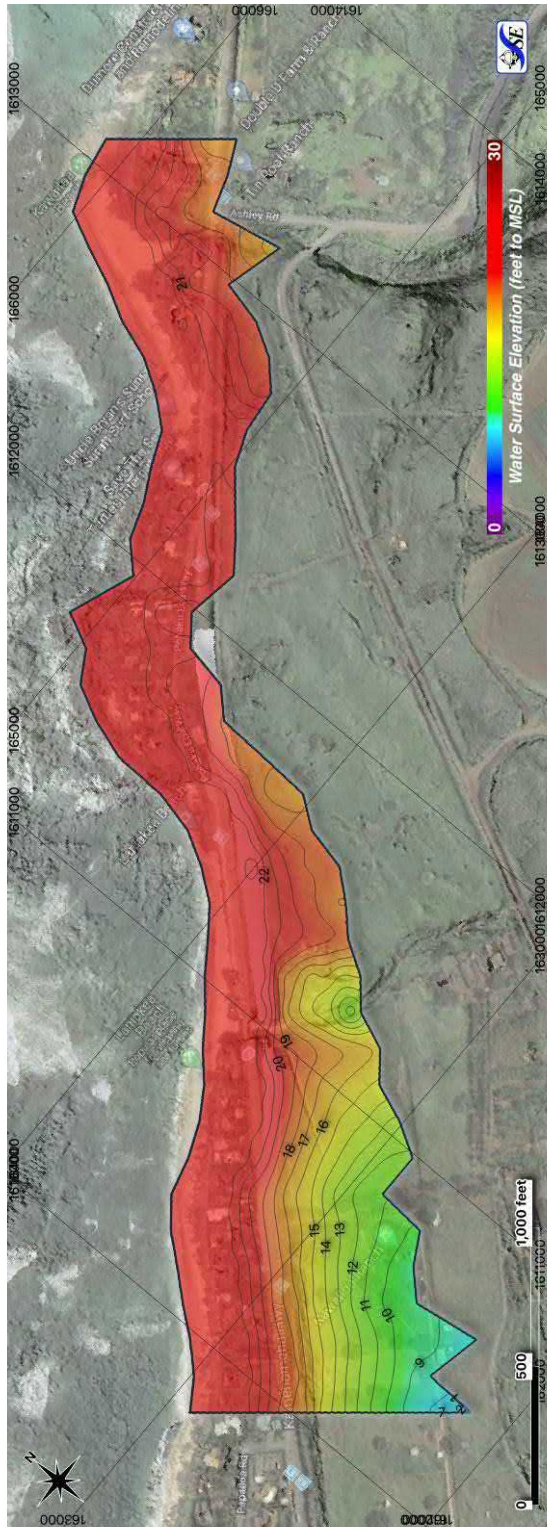

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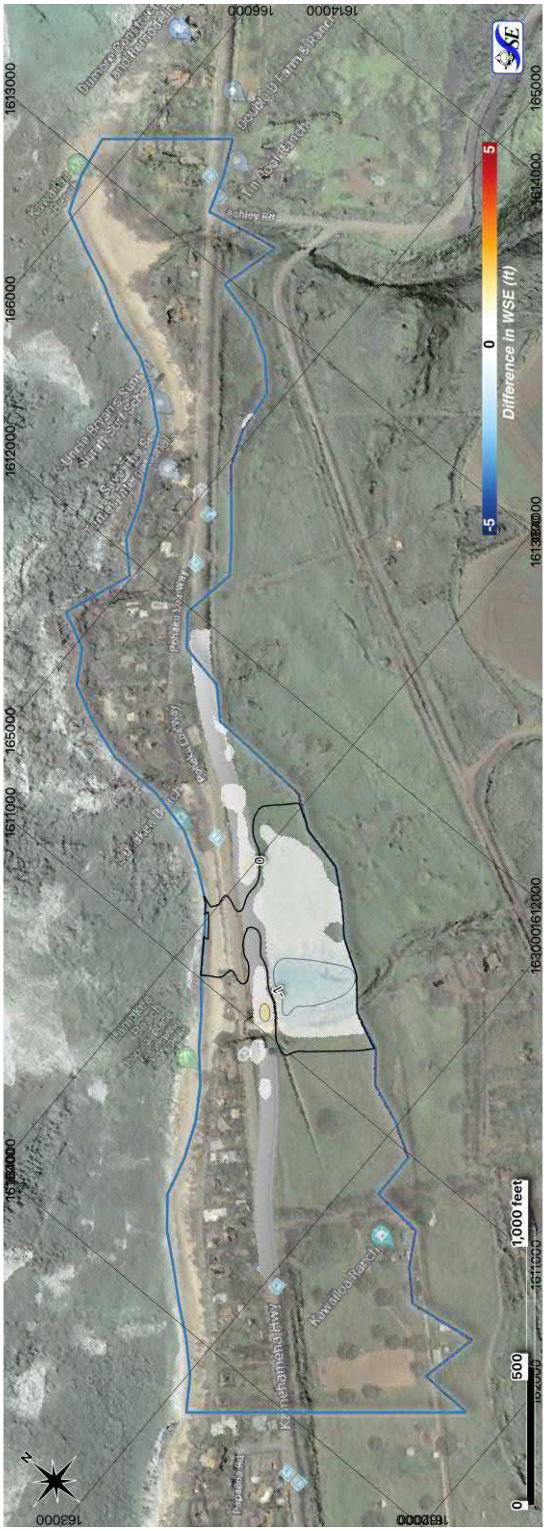

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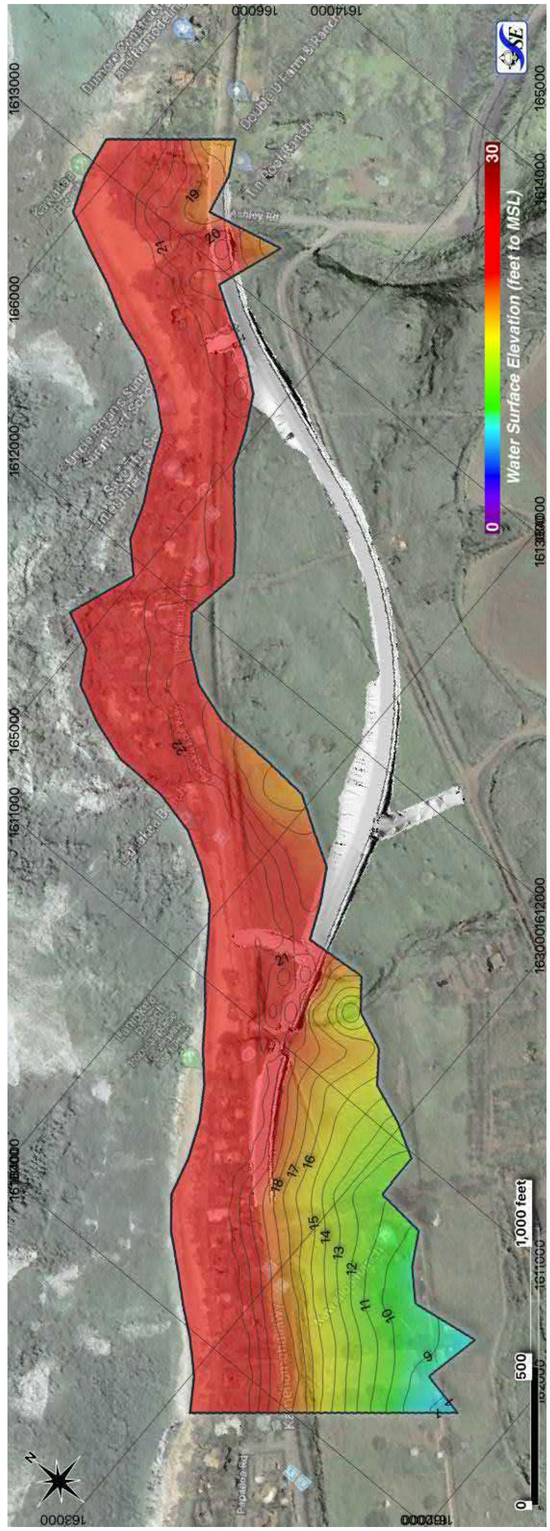

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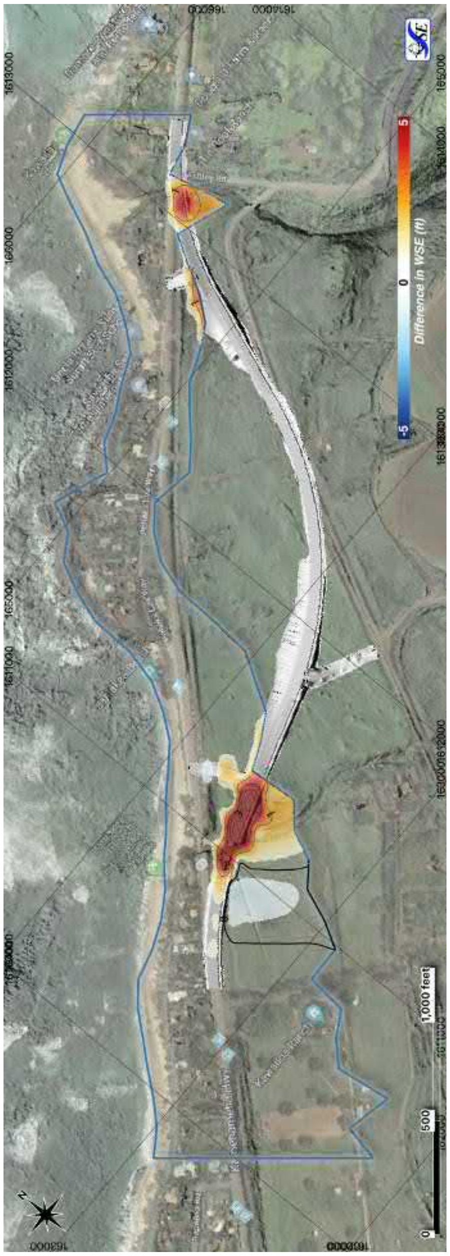

Figure 3-11

APPENDIX B

WATER SURFACE ELEVATION PLOTS

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Appendix

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Traffic Noise Technical Report

TECHNICAL REPORT

Kamehameha Highway Pedestrian Safety Project Vicinity of Laniakea Beach Traffic Noise

Haleiwa, Island of Oahu, Hawaii

March 2021

Prepared for:
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

TABLE OF CONTENTS

List of Figures

List of Tables

EXECUTIVE SUMMARY

The purpose of this report is to analyze the traffic noise impacts of the proposed realignment of Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach (Figure 2-1), on the island of Oahu. The Hawaii State Department of Transportation (HDOT) is proposing to realign the highway to improve pedestrian safety, system reliability, and local access to beach and private property, while working to improve overall system mobility with the new alignment.

Two realignment Build alternatives are being considered: (1) the "Pedestrian Shift" Alternative, which would shift the highway roughly 80 feet mauka from the centerline of the existing highway alignment to the centerline of the proposed realigned highway; and a "Most Realignment" Alternative, which would shift the highway further mauka to near the base of the steeper slope where a former cane haul road exists. No-Build and Transportation System Management (TSM) alternatives are also being considered. Typical lane configurations on Kamehameha Highway with the proposed Project area are shown in Figure 2-2.

Land uses closest to the Project area include residences, ranching and agricultural land, windmills, and undeveloped land.

Short-term and long-term measurements were conducted by Parsons Brinckerhoff on October 1st and 2nd, 2014. Noise levels measured were used to validate the FHWA Traffic Noise Model (TNM) at six sites. TNM was then used to model existing and future worst-hour traffic noise levels (Table 3-4 and Table 4-2). WSP conducted site visits in November and December of 2019 to confirm consistency between the sound levels and noise sources documented in 2014.

Worst-hour traffic noise levels were modeled with updated traffic data for existing conditions (year 2015) and future year 2030. Existing traffic noise levels approached or exceeded the Noise Abatement Criteria (NAC) at five residences and at two areas of Laniakea Beach closest to Kamehameha Highway. Existing modeled worst-hour traffic noise levels range from 44 dBA to 66 dBA (Table 3-4). The six sites modeled to experience existing noise levels that approach or exceed the NAC are located adjacent to and makai of Kamehameha Highway.

Worst-hour future-year traffic noise levels without the proposed Project (2030) would approach or exceed the NAC at 14 residences and at two areas of Laniakea Beach closest to Kamehameha Highway. Future year modeled worst-hour traffic noise levels without the Project range from 45 dBA to 67 dBA

(Table 4-2). The 15 modeled sites predicted to experience future noise levels that approach or exceed the NAC without the Project are located adjacent to and makai of Kamehameha Highway.

Worst-hour future-year traffic noise levels with the proposed Project (2030) would approach or exceed the NAC with the “Pedestrian Shift” Alternative at 6 residences and 1 formerly planned park and with the ”Most Realignment” Alternative at 1 residence. Future-year modeled worst-hour traffic noise levels with the Project range from 45 dBA to 67 dBA with the “Pedestrian Shift” Alternative and range from 45 dBA to 66 dBA with the ”Most Realignment” Alternative (Table 4-2). The 6 sites modeled to experience future noise levels that approach or exceed the NAC with the “Pedestrian Shift” Alternative are located adjacent to and makai of Kamehameha Highway near the southern end of the Project area. Only one site modeled experienced future noise levels that approach or exceed the NAC with the ”Most Realignment” Alternative and is located adjacent to and makai of Kamehameha Highway near the southern end of the Project area.

Noise abatement was considered at all 6 sites predicted to experience noise levels that would approach or exceed the NAC with both Project Alternatives; however, noise abatement would be not feasible at all 6 locations.

During Project construction, adjacent areas would be exposed to construction noise in addition to traffic-related noise. Impacts during construction are of short duration and standard specifications for noise control would minimize or eliminate impacts during construction.

Based on the modeling results and future traffic volumes and speeds included in this report, areas within 200 feet of Project improvements along Kamehameha Highway (for both alternative alignments) may experience noise levels that exceed the HDOT residential and recreational land use noise abatement criteria of 66 dBA. Commercial areas located within 50 feet of Kamehameha Highway (for both alternative alignments) may exceed the commercial abatement criteria of 71 dBA. It is recommended that the local officials use this information as a guide when developing future land use plans, zoning, or building code requirements. The use of this information may assist local government with future development plans and thereby result in development that is consistent with the noise environment.

CHAPTER 1
INTRODUCTION

This traffic noise study has been initiated to support the National Environmental Policy Act (NEPA) and Hawaii Environmental Policy Act (HEPA) Environmental Assessment (EA) for the Kamehameha Highway Pedestrian Safety Project. The purpose of this report is to analyze noise impacts of the proposed improvements to Kamehameha Highway in the vicinity of Laniakea Beach, on the island of Oahu.

This study evaluates the existing conditions and Future conditions with two build alternatives. Worst-hour traffic noise levels were modeled with traffic data for existing condition year 2015 and Future year 2030.

This study was prepared in accordance with FHWA rules and procedures (FHWA 2010) and HDOT Noise Analysis and Abatement Policy (HDOT, 2016). Its elements include:

1. Measurements of existing noise levels at representative noise sensitive receivers;
2. Prediction of future traffic noise levels;
3. Comparison of existing and predicted future traffic noise levels with the FHWA Noise Abatement Criteria (NAC);
4. Noise impact assessment;
5. The effects of construction noise and consideration of mitigation measures; and
6. Information to local planning officials.

CHAPTER 2
PROJECT DESCRIPTION

HDOT is proposing to realign the Kamehameha Highway near Laniakea Beach (Figure 2-1) to improve the public highway system in terms of pedestrian safety, mobility, and reliability while supporting local access to this public beach and private property. Two Build Alternatives are being considered: (1) the "Pedestrian Shift" Alternative, which would shift the highway roughly 80 feet mauka from the centerline of the existing highway alignment to the centerline of the proposed realigned highway; and a "Most Realignment" Alternative, which would shift the highway further mauka to near the base of the steeper slope where a former cane haul road exists. No-Build and Transportation System Management (TSM) alternatives are also being considered. The Build Alternatives share the following characteristics:

- Highway right-of-way would typically be 60 feet wide, but adjusted narrower or wider depending on needs related to the proposed improvements and existing constraints.
- A highway with two 12-foot wide through lanes (one in each direction).
- Vehicular guardrails on the mauka side of Kamehameha Highway prior to construction of the new alignments.
- Bus stops.
- Bicycle and pedestrian facilities consisting of a 16-foot wide shared use path on a portion of the existing Kamehameha Highway. The remaining portion of the highway would be removed and revegetated.
- Permanent stormwater best management practices (BMPs) to address highway stormwater runoff.

The alternatives would retain the current roadway capacity by providing one through lane in each direction. Pedestrian and bicycle facilities would be included along the old Kamehameha Highway for both Build alternatives. The Project is included in the current Statewide Transportation Improvement Program (STIP) and the Hawaii Long Range Land Transportation Plan. Project construction is expected to be completed in roughly 18 months, including design and construction, from HDOT receiving Notice to Proceed with the Project if the "Pedestrian Shift" Alternative is selected. If the "Most Realignment" Alternative is chosen, the duration of the necessary design, permiting, and construction processes may take approximately 6 years. The typical lane configurations that the proposed Project would use are shown in Figure 2-2.

2.1 "PEDESTRIAN SHIFT" ALTERNATIVE

The "Pedestrian Shift" Alternative generally consists of realigning Kamehameha Highway mauka roughly 80 feet from its current location from the Haleiwa side of Lauhulu Stream bridge to the Haleiwa side of Kawailoa Stream bridge, a distance of roughly 0.44 mile.

This alternative would include the items discussed above and be designed in compliance with the guidelines indicated to the degree possible. Additional components and details of this alternative would include:

- Vehicular guardrails could be placed on the mauka side of the existing Kamehameha Highway during the Project design and construction phases.
- A normal asphalt road structure with underlying concrete reinforcement on the makai side to protect the road from eroding.
- A 10-foot wide median refuge lane for part of the distance.
- Vehicular guardrail to prevent parking on the mauka side of the shifted highway.
- Existing cross streets and driveways would be modified to allow access to the shifted Kamehameha Highway.
- Turn lanes as deemed necessary at the intersections of the realigned Kamehameha Highway and existing cross streets.
- One new bridge at Lauhulu Stream (on the Haleiwa side of Laniakea Beach). The existing bridge at Laniakea Stream would remain.
- A vehicle control gate on Pohaka Loa Way.
- Under this alternative it is proposed that the permanent stormwater BMPs will consist of the construction / installation of a grassed swale on the mauka side of the highway for stormwater treatment.

2.2 "MOST REALIGNMENT" ALTERNATIVE

The "Most Realignment" Alternative generally consists of realigning Kamehameha Highway mauka as far as feasible from a location on the Haleiwa side of the Laniakea Stream bridge to the Waimea side of Ashley Road; a distance of roughly 0.8 mile. The realigned highway would cross the relatively low-sloped coastal plain and run along the base of the relatively steeper "pali" where a former cane haul road exists.

This alternative would include the characteristics discussed above along with these additional components:

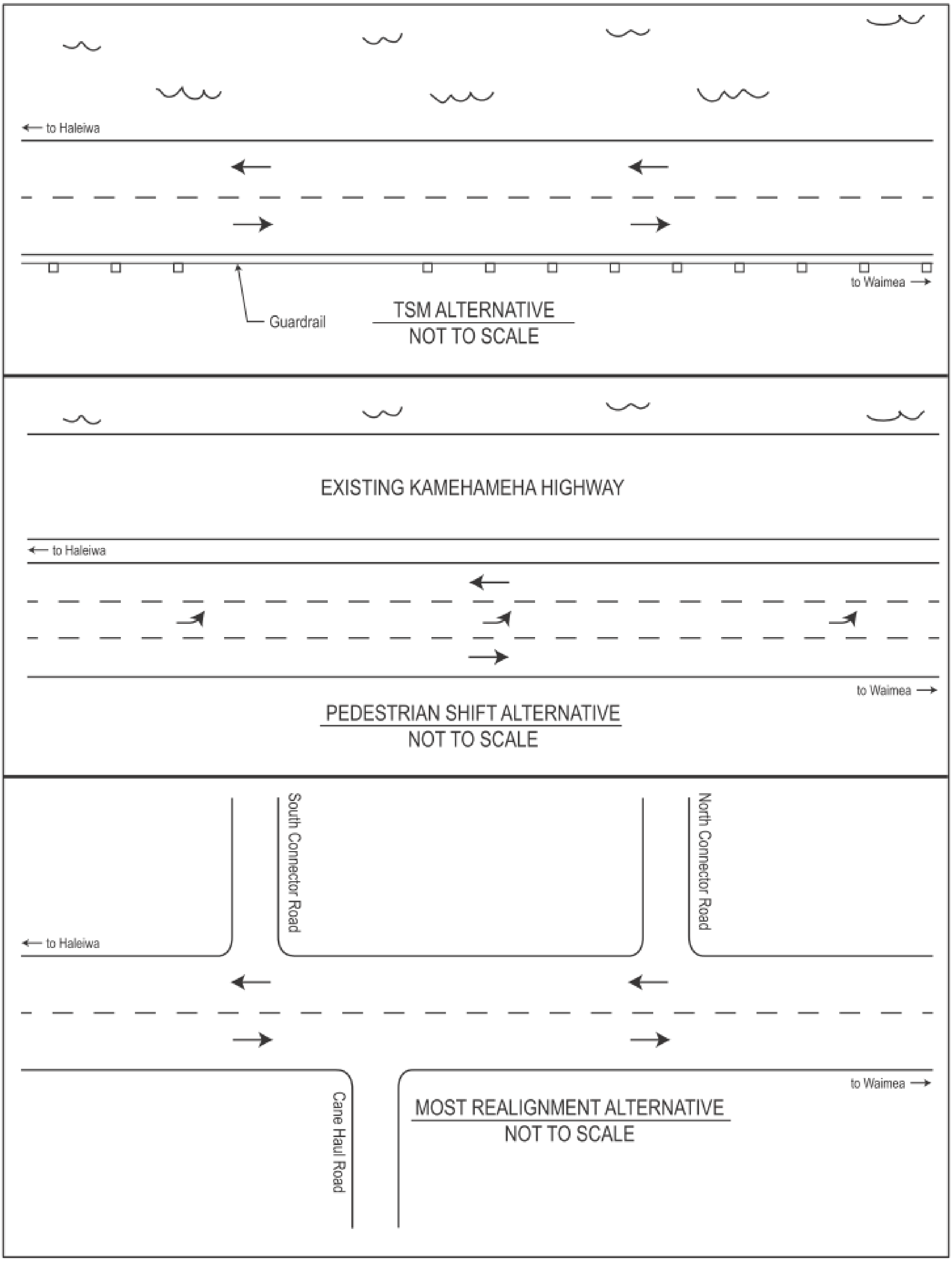
- Vehicular guardrails could be placed on the mauka side of the existing Kamehameha Highway during the Project design and construction phases.
- Two new roads connecting the realigned Kamehameha Highway to the existing highway alignment. These connector roads would have the following general design:
  - Typically a 60-foot wide ROW.
  - Typically two 10-foot wide travel lanes wtih four-foot wide shoulders.
- Connector road intersections with Kamehameha Highway would be stop controlled (stop sign for the connector road only).

- Existing driveways would be modified to allow access to the realigned Kamehameha Highway.
- A vehicle control gate on Pohaka Loa Way.
- New Cane Haul connector road.
- Two new bridges. One at Laniakea Stream (on the Haleiwa side of Laniakea Beach) and one at Kawailoa Stream (near Chun's Reef Beach).
- Under this alternative it is proposed that permanent stormwater BMPs consist of a stormwater swale on the mauka side of the highway.

Figure 2-1. Project Location and Project Alternatives

WSP, 2020

Figure 2-2. Existing and Proposed Project Lane Configurations



WSP, 2020

CHAPTER 3
EXISTING NOISE ENVIRONMENT

3.1 BACKGROUND

Noise is defined as any sound that is undesirable or interferes with normal human activities. The decibel (dB) scale is used to quantify sound intensity and represents the ratio between a given sound and the faintest sound detectable by human hearing. Because sound pressure levels vary widely within the range of human hearing, the dB scale is logarithmic. The human ear is not equally sensitive to all frequencies within the entire sound spectrum. Accordingly, noise measurements are made using an A-weighting (dBA) scale to correspond to human perceptions of noise. A-scale sound levels are currently in use in many community and city noise ordinances and in state and city highway traffic noise codes.

Time variation in noise exposure is typically accounted for as a constant energy level equivalent (Leq) for a given time period. The Leq is the constant noise level over a specified period of time that is equivalent in energy to a fluctuating (or brief) noise "averaged" over that period of time. Leq is also a function of time and is expressed as Leq (time period). For example, Leq(h), expressed in A-weighted decibels (dBA), is the calculated constant noise over one hour which is equivalent in total energy to the varying noise levels actually measured during that one hour.

3.2 NOISE STANDARDS

The HDOT Noise Analysis and Abatement Policy implements FHWA regulations on noise abatement (23 CFR 772) for the State of Hawaii. The regulations and policy require that a noise analysis be performed whenever potentially affected receivers exist, either as developed lands or lands that are planned, designed, or programmed for future use.

Projects requiring traffic noise studies include one of the following characteristics:

1. Construction of a highway in a new location; or
2. Substantial horizontal or vertical alteration of an existing highway; or
3. Addition of through traffic lane(s) or most auxiliary lanes including restriping existing pavement to add through traffic lane(s) or auxiliary lane(s); or
4. Addition or relocation of interchange lanes or ramps; or

5. Addition of a new or substantial alteration of a weigh station rest stop, ride-share lot or toll plaza; or

6. If a project meets one of the Type I project criteria presented above, the entire project area is defined as a Type I project for inclusion in the traffic noise study.

The Type I project definition that this project meets is the inclusion of a substantial horizontal and vertical shift in highway alignment.

FHWA has established the Noise Abatement Criteria (NAC), shown in Table 3-1, for different exterior and interior land use activities. The NAC do not constitute legally-enforceable noise standards, but represent a yardstick for evaluating the effect of Project noise on the surrounding community. The NAC established by FHWA have been adopted by the State of Hawaii as its standard.

Under HDOT policy, a noise impact occurs when the predicted traffic noise levels approach or exceed the NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels. "Approach" means at least 1 dBA less than the NAC, and "substantially exceed the existing noise levels" means an increase of at least 15 dBA. If the NAC are approached or exceeded, or if there is a substantial increase above the existing noise level, noise abatement measures must be considered.

Changes in traffic noise are assessed using human perceptions of sound level changes. Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, but a change of 10 dBA is perceived as a doubling (or halving for a decrease) of noise levels. These guidelines permit estimation of an individuals probable perception of changes in noise levels.

Table 3-1. FHWA NAC

Activity Category	Activity Leq(h) dBA[1]	Criteria [2] L10(h)	Evaluation Location	Description of Activity
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential.
C[3]	67	70	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas Section 4(f) sites, schools, televisions studios, trails, and trail crossings.

D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	----	----	----	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities, (water resources, water treatment, electrical), and warehousing.
G	----	----	----	Undeveloped lands that are not permitted.

Notes: [1] Either Leq(h) or L10(h) (but not both) may be used on a Project.
[2] The Leq(h) and the L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[3] Includes undeveloped lands permitted for this activity category.
L10(h) is the noise level exceeded for 10% of the time of the measurement duration (one hour).
Source: Federal Highway Administration

3.3 EXISTING AND FUTURE NOISE-SENSITIVE LAND USES

Existing and future noise sensitive land uses and activities adjacent to the Kamehameha Highway Pedestrian Safety Project and nearby major roadways were identified from site inspections and existing land use mapping. Where private parcels are present on the makai side of the highway, residential uses (Category B land use activity) dominate with two former residential parcels now being owned by the City and County of Honolulu for use as a park (land use Category C). Category B and Category C activities have an exterior NAC of Leq(h) 67 dBA. Land use on the mauka side of the highway is dominated by ranching and agricultural uses (Category F land use category). Category F land use activities do not have corresponding noise impact thresholds. There is one residence on the mauka side of the highway; the Tin Roof Ranch is both an agricultural operation and residence.

Mauka of the Project area, above the pali on Ashley Road, is a windfarm with windmills among the agriculture fields. Previously these fields were used for sugar cultivation but are now used for seed corn and other crops. On the Haleiwa side of the Project area is the town of Haleiwa, a commercial (land use Category E) and residential town popular with visitors. Category E activities have an exterior NAC of Leq(h) 72 dBA. Kamehameha Highway, State Route 83, previously went through the town of Haleiwa. State Route 83 now bypasses Haleiwa town and is known as the Joseph P. Leong Highway. On the Waimea side of the Project area the general development trends continue – residential uses on the makai side of the highway and agricultural uses on the mauka side; however, more residential uses are being developed on the mauka side both before and after Waimea Bay, a nonprofit botanical garden and cultural park.

There are no pending or proposed modifications to the State land use districts in the Project area. The current land uses are also consistent with the City and County of Honolulu land use zoning. The residential areas on the makai side of the highway are zoned R-5 and the agricultural areas on the mauka side of the highway are zoned AG-1. Because the current land uses are consistent with zoning, no significant changes in land use are anticipated.

The City and County of Honolulu had plans to develop two beach parks: the "Laniakea Beach Support Park" near Laniakea Beach and "Kawailoa Beach Park" near Chun's Reef Beach. EAs have been completed for these two beach park projects but the City and County of Honolulu no longer intends to develop these facilites. The Laniakea Beach Support Park was planned for the mauka side of Kamehameha Highway and the Kawailoa Beach Park consisted of areas on both the mauka and makai side of Kamehameha Highway. The parks were planned to generally consist of parking areas, comfort stations (bathrooms and showers), and landscaped areas.

Kamehameha Schools' "Moku O Waialua North Shore Plan, Paalaa to Kapaeloa" plan outlines potential projects on their land holdings (roughly 26,200 acres) in the region, which includes the majority of the land on the mauka side of Kamehameha Highway in the Project area.

3.4 NOISE MEASUREMENT SITES

In 2014 short-term (15 to 30 minutes) and long-term (24 hours) measurements were taken at six locations along the Project study area to describe the existing noise environment. Field measurements offer a baseline for establishing existing ambient noise levels in the area and are used for estimating future noise levels by adding ambient levels to other noise levels generated by the proposed Project. The field measurements were conducted in accordance with FHWA guidelines (Parsons Brinckerhoff, 2014).

The ambient noise environment in the vicinity of the Project is comprised of several noise sources including vehicular traffic traveling on the highway itself. Other noise sources that are typically audible in the area include landscaping, wildlife, and neighborhood pets. Atmospheric conditions also influence noise levels in the area with variable ocean tides and wind patterns. A 24-hour noise measurement was conducted between October 1 and 2, 2014 that shows that hourly sound levels range from 55 to 64 dBA Leq from midnight to 8:00 a.m. with sound levels ranging from 66 to 69 dBA Leq during daytime hours (Parsons Brinckerhoff, 2014).

For this study, the six short-term measurements located near Kamehameha Highway were used to validate the traffic noise model. The location of the short-term measurements is illustrated on Figure 3-1 land uses and measured noise levels at each site described in Table 3-2.

Short-term measurements were conducted for 15 minutes to obtain an equivalent sound level during free-flowing traffic conditions. Vehicular traffic counts and traffic mix were documented during the measurement periods. The noise measurements were taken using a Larson-Davis Laboratories, Model 820, Type-1 integrating sound level meter together with a Larson-Davis microphone. This equipment satisfies the ANSI S1.4-1983 specification and has been certified by the manufacturer within the recommended 2-year calibration period. The microphone and sound level meter were mounted on a tri-pod and a windscreen covered the microphone throughout the duration of each measurement.

HDOT was contacted to identify any noise complaints received within the Project corridor. At the time of this report, no complaints are on file at HDOT relating to traffic noise along this area of Kamehameha Highway and no complaints from the community about experiencing louder nighttime traffic noise levels than during daytime hours (HDOT, 2019). Site observations indicated that short-term measurement periods provided sufficient traffic noise levels with free-flow traffic conditions for noise model validation to support prediction of worst-hour, or loudest hour, traffic noise levels.

WSP conducted site visits in November and December of 2019 to confirm consistency between the sound levels and noise sources documented in 2014.

Figure 3-1. Short-Term Noise Measurement Locations

Source :WSP (Parsons Brinckerhoff), 2015

3.5 MODELING SITES

Forty-four residential sites and one recreation area were modeled to evaluate existing noise levels and future noise levels with and without the Project Alternatives. Modeling locations will also provide information to local authorities to predict noise levels at undeveloped properties along the Project area. Modeling locations were placed at outdoor areas of frequent human use facing Kamehameha Highway. The approximate location of each modeled site is illustrated in Figures 3-2, 4-1, 4-2, and 4-3.

3.5.1 Sites MD1 to MD6 and MD8 to MD20

Modeling Sites MD1 through MD6 and MD8 through MD19 were chosen to represent noise levels at first row residences located on the makai side of Kamehameha Highway between Papailoa Road and Laniakea Beach. Modeling locations are within 100 feet of the existing Kamehameha Highway alignment.

3.5.2 Site MD7

Modeling Site MD7 was added to the noise model to represent the residence closest to Project improvements on the mauka side of Kamehameha Highway between Papailoa Road and Laniakea Beach. Site MD7 is within 200 feet of the existing Kamehameha Highway alignment.

3.5.3 Site MD20

Modeling Site MD7 was added to the noise model to represent outdoor use at Laniakea Beach. Site MD20 is within 100 feet of the existing Kamehameha Highway alignment.

3.5.4 Sites MD21 to MD30

Modeling Sites MD21 through MD30 were chosen to represent noise levels at residences located on the makai side of Kamehameha Highway along Pohaku Loa Way. Modeling locations are within 200 feet of the existing Kamehameha Highway alignment.

3.5.5 Sites MD31 to MD42

Modeling Sites MD31 through MD42 were chosen to represent noise levels at first row residences located on the makai side of Kamehameha Highway east of Ashley Road. Modeling locations are within 100 feet of the existing Kamehameha Highway alignment.

3.5.6 Site MD43

Modeling Site MD43 was added to the noise model to represent properties on the mauka side of Kamehameha Highway between Papailoa Road and Laniakea Beach. Site MD43 is located approximately 500 feet east of the existing Kamehameha Highway alignment.

3.5.7 Site MD44

Modeling Site MD44 was added to the noise model to represent properties on the mauka side of Kamehameha Highway east of Ashley Road. Site MD44 is located approximately 100 feet east of the existing Kamehameha Highway alignment.

3.5.8 Site MD45

Modeling Site MD45 was added to the noise model to represent properties on the mauka side of Kamehameha Highway west of Ashley Road. Site MD45 is located approximately 625 feet east of the existing Kamehameha Highway alignment.

3.6 MODEL CALIBRATION

The traffic noise prediction model was calibrated to adjust the model to actual site conditions. Model calibration is performed by adjusting calculated future noise levels by adding a constant derived from the difference between measured and calculated noise levels at representative sites. The distinction between calculated and predicted noise levels is as follows:

- Calculated noise levels (existing or future) are the results of the model.
- Predicted noise levels are adjusted or "calibrated" modeled values.

If there is reasonable agreement between measured and model noise levels (within 3.0 dBA), a calibration factor is not used to adjust the existing and future noise levels.

FHWA Traffic Noise Model (TNM) version 2.5 was used to model existing traffic noise levels at the measurement sites along the existing Kamehameha Highway and the sites along the proposed Project Alternatives (Figure 2-1). Geometries of the existing roadway and noise modeling sites were entered into the model. Traffic volumes counted during the short-term measurement periods were scaled up to one-hour volumes and entered into the model along with the measured vehicle speeds.

There is reasonable agreement between measured and modeled noise levels (within 2.0 dBA) for all the measured sites along Kamehameha Highway. All modeling sites were modeled to show existing and future noise levels at outdoor areas of frequent human use.

Table 3-2. Noise Measurement Data and TNM Model Validation

Site ID	Site Location	Land Use	Date of Measurement and Start Time	Measured Leq(h), dBA	Modeled Noise Level for Calibration Leq(h), dBA	Difference between Modeled and Measured Noise Level Leq(h), dBA
1	Laniakea Beach/ Kamehameha Hwy	Residential	10/1/14; 1:39 p.m.	74	72	-2
2	Across Street from 61427 Kamehameha Hwy	Residential	10/1/14; 10:44 a.m.	65	65	0
3	Adj to 61-499 Kamehameha Hwy	Residential	10/1/14; 2:05 p.m.	72	71	-1
4	61-540 Pohaku Loa Way	Residential	10/1/14; 11:21 a.m.	72	72	0
5	Chuns Reef/ Kamehameha Hwy	Recreation	10/1/14; 12:15 p.m.	63	64	1
6	61635 Kamehameha Hwy	Residential	10/1/14; 11:52 a.m.	73	71	-2

Note : All measurements were taken at outdoor use areas for 15 minutes
Modeled Noise Levels Leq(h) are within 3 dBA of measured values indicating the model is correctly calibrated.

3.7 EXISTING NOISIEST TRAFFIC HOUR

To determine the existing worst-hour traffic noise levels, traffic data was used for Existing Year 2015 developed in the traffic analysis for the Kamehameha Highway Realignment (WSP USA, 2020). Input variables to noise modeling and analysis include traffic volumes, speeds, and vehicle fleet mix (auto, medium truck, and heavy truck percentages). The existing vehicle mix to be 97.5 percent autos, 1.5 percent medium trucks, 0.5 percent heavy trucks, and 0.5 percent buses for all roadways. Table 3-3 shows the existing worst-hour traffic volumes.

Table 3-3. Existing 2015 (Worst-Hour) Traffic Volumes

Roadway	From Cross Street	To Cross Street	Northbound Vehicles per Hour	Southbound Vehicles per Hour	Posted Speed Limit (MPH)
Kamehameha Highway	From North	Pohaku Loa Way	742	710	35
Kamehameha Highway	At Cross Street	Pohaku Loa Way	742	710	35
Kamehameha Highway	From South	Pohaku Loa Way	742	710	35

Note : Traffic volumes from Kamehameha Highway Pedestrian Safety Traffic Analysis, WSP USA, 2020.

Figure 3-2. Predicted Existing Worst-Hour Traffic Noise Levels

Source :WSP, 2020

3.8 RESULTS OF EXISTING YEAR NOISE MODELING

Table 3-4 presents the modeled existing worst-hour (PM peak hour) traffic noise levels, the number of receptors represented by each measurement site, and the NAC for each of the short-term and modeled measurement locations. Existing modeled worst-hour traffic noise levels for residential areas range from 44 dBA to 66 dBA (Table 3-4). Modeling sites primarily represent noise levels at outdoor areas at first row homes located adjacent to Kamehameha Highway with two modeled sites (MD20 and MD30) representing two areas of Laniakea Beach. Worst-hour noise levels depend on the proximity of the receiver to the roadway traffic and the presence of buildings and topography providing noise attenuation between the receiver and the roadway. The worst-hour traffic noise levels approached or exceeded the NAC at six sites that represent: five residences located adjacent to and makai of Kamehameha Highway, Laniakea Beach and a formerly planned park.

Table 3-4. Predicted Existing Worst-Hour Traffic Noise Levels

Site ID	Land Use Activity/HDOT Noise Abatement Category (Criterion)* Leq(h), dBA	Number of Receivers Represented	Modeled Existing Worst-Hour Leq(h), dBA	A/E Impact or None)
MD1	B/66	1	65	None
MD2	B/66	1	63	None
MD3	B/66	1	64	None
MD4	B/66	1	64	None
MD5	B/66	1	64	None
MD6	B/66	1	65	None
MD7	B/66	1	60	None
MD8	B/66	1	65	None
MD9	B/66	1	64	None
MD10	B/66	1	64	None
MD11	B/66	1	64	None
MD12	B/66	1	63	None
MD13	B/66	1	65	None
MD14	B/66	1	64	None
MD15	B/66	1	65	None
MD16	B/66	1	66	A/E
MD17	B/66	1	65	None
MD18	B/66	1	66	A/E
MD19	B/66	1	65	None
MD20	C/66	Park	66	A/E
MD21	B/66	1	64	None
MD22	B/66	1	56	None
MD23	B/66	1	57	None
MD24	B/66	1	58	None
MD25	B/66	1	59	None
MD26	B/66	1	61	None
MD27	B/66	1	62	None
MD28	B/66	1	62	None
MD29	B/66	1	64	None

MD30	B/C/66	1 + Park	66	A/E
MD31	B/66	1	66	A/E
MD32	B/66	1	66	A/E
Site ID	Land Use Activity/HDOT Noise Abatement Category (Criterion)* Leq(h), dBA	Number of Receivers Represented	Modeled Existing Worst-Hour Leq(h), dBA	A/E Impact or None)
MD33	B/66	1	65	None
MD34	B/66	1	65	None
MD35	B/66	1	61	None
MD36	B/66	1	61	None
MD37	B/66	1	62	None
MD38	B/66	1	62	None
MD39	B/66	1	63	None
MD40	B/66	1	63	None
MD41	B/66	1	64	None
MD42	B/66	1	64	None
MD43	B/66	1	44	None
MD44	B/66	1	63	None
MD45	B/66	1	44	None

Note : See Table 3-1 for descriptions of Noise Abatement Categories.
Bold = level approaches or exceeds the NAC.
A “Receiver” is an area of frequent human outdoor activity, homes, apartments, motel, hotels, etc.
Modeled worst hour Leq(h) values are within 3 dBA of measured values indicating the model is correctly calibrated.
A/E Impact = Approach or Exceed NAC Impact

CHAPTER 4
FUTURE TRAFFIC NOISE IMPACTS

4.1 PREDICTION METHODOLOGY

FHWA TNM version 2.5 was used to model the worst-hour (PM peak hour) noise levels in 2030 at 45 sites for the proposed Project Alternatives ("Pedestrian Shift" and "Most Realignment") along Kamehameha Highway. Future noise levels were calculated for the Year 2030 traffic.

Input variables to noise modeling and analysis include traffic volumes, speeds, and vehicle fleet mix (auto, medium truck, and heavy truck percentages). The noise analysis considers the peak traffic hour as the noisiest hour of the day. The number of vehicles expected to travel on Kamehameha Highway in 2030 is based on traffic data from traffic modeling analysis, February 2020 (WSP USA, 2020). Future vehicle mix is projected to be 97.5 percent autos, 1.5 percent medium trucks, 0.5 percent heavy trucks, and 0.5 percent buses for all roadways.

Table 4-1. Proposed Project 2030 (Worst-Hour) Traffic Volumes

Roadway	From Cross Street	To Cross Street	Northbound Vehicles per Hour	Southbound Vehicles per Hour	Posted Speed Limit (MPH)
Kamehameha Highway	From North	Pohaku Loa Way	899	873	35
Kamehameha Highway	At Cross Street	Pohaku Loa Way	899	873	35
Kamehameha Highway	From South	Pohaku Loa Way	899	873	35

Note : Traffic volumes from Kamehameha Highway Pedestrian Safety Traffic Analysis, WSP USA, 2020.

4.2 NOISE IMPACT ANALYSIS

In terms of the one-hour Leq (h) noise descriptor, a noise impact could potentially require mitigation if either of the following conditions is predicted to occur:

- Future year traffic noise approaches or exceeds the FHWA NAC, or
- Future year traffic noise substantially exceeds (15 dBA or more) the existing ambient noise level.

Predicted 2030 worst-hour traffic noise levels without the proposed Project would range from 45 dBA to 67 dBA (Table 4-2) with an increase of 1 to 2 dBA at each modeled site over existing noise levels due to increased traffic volumes along the existing alignment in the year 2030. Worst-hour future-year traffic noise levels without the proposed Project (2030) would approach or exceed the NAC at 15 modeled sites located adjacent to and makai of Kamehameha Highway representing 14 residences, Laniakea Beach, and a formerly planned park.

Predicted 2030 worst-hour traffic noise levels with the proposed Project under the “Pedestrian Shift” Alternative would range from 45 dBA to 67 dBA (Table 4-2) with a decrease of 8 dBA to an increase of 2 dBA compared to existing noise levels. A decrease in noise levels compared to existing conditions is predicted at modeled sites MD12 to MD21, where the alignment shifts the furthest away from nearby residences under the “Pedestrian Shift” Alternative. Increased noise levels of up to 2 dBA would result from increased traffic volumes and the minor alignment shift nearer to the modeled sites in the year 2030. Worst-hour future-year traffic noise levels with the “Pedestrian Shift” Alternative (2030) would approach or exceed the NAC at 6 residences and 1 formerly planned park located adjacent to and makai of Kamehameha Highway near the southern end of the Project area.

Predicted 2030 worst-hour traffic noise levels with the proposed Project under the “Most Realignment” Alternative would range from 45 dBA to 66 dBA (Table 4-2) with a decrease of 18 dBA to an increase of 7 dBA compared to existing noise levels. A decrease in noise levels compared to existing conditions is predicted in the central area of the Project where the Kamehameha Highway alignment shifts the furthest away from residences currently located near the existing alignment. Increased noise levels of up to 7 dBA are predicted where the “Most Realignment” Alternative shifts nearer to the modeled sites, which combined with the increased traffic volume in 2030 would increase noise levels at homes/sensitive located nearby. Worst-hour future-year traffic noise levels with the ”Most Realignment” Alternative (2030) would approach or exceed the NAC at 1 residence located adjacent to and makai of Kamehameha Highway near the southern end of the Project.

There would be no substantial noise increase impacts as a result of the proposed Project with either Project Alternative.

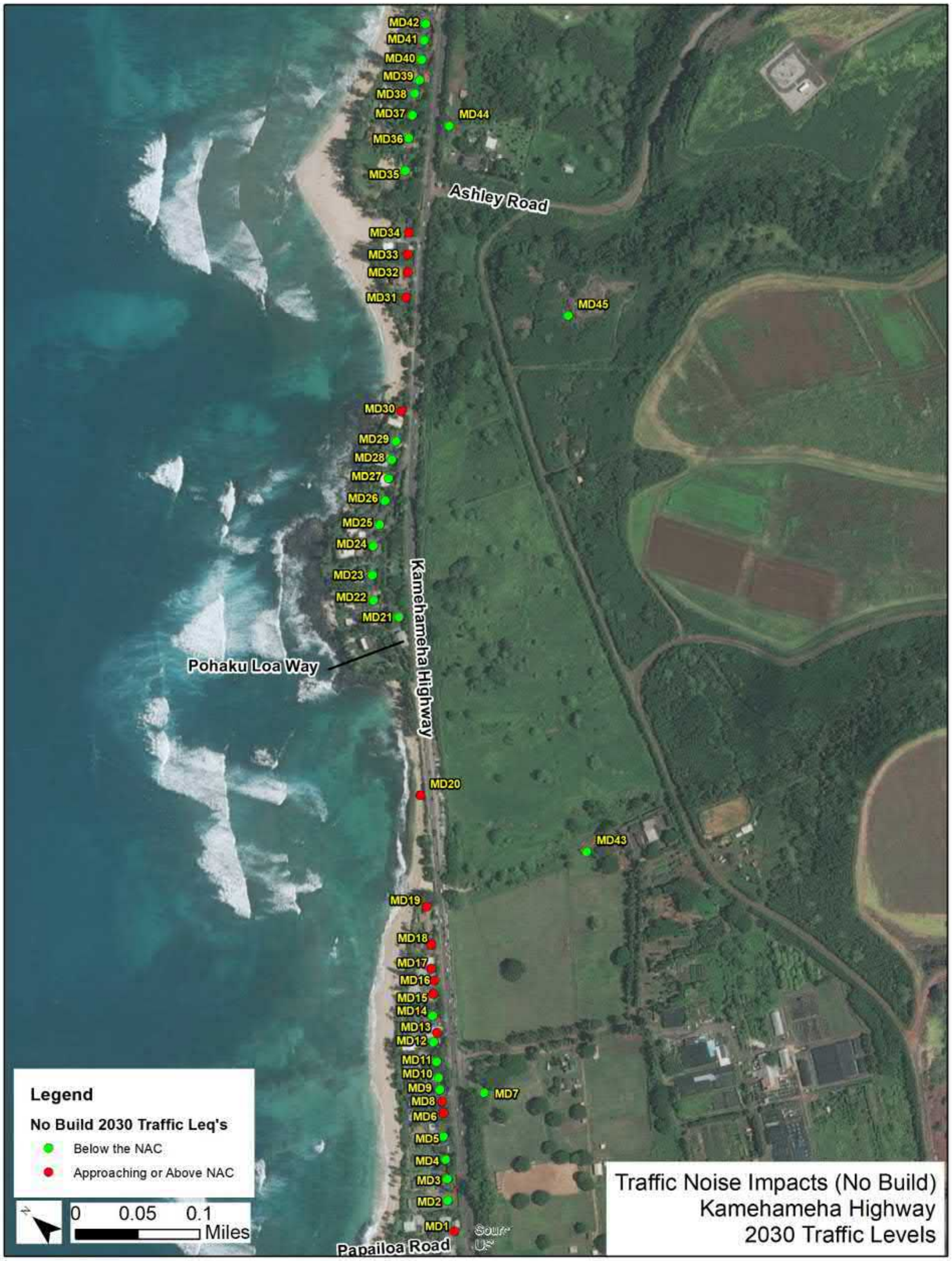
Table 4-2. Existing and Proposed Project Worst-Hour Traffic Noise Levels

Site ID	Land Use Activity/HDOT Noise Abatement Category (Criterion)* Leq(h), dBA	Number of Receivers Represented	Modeled Existing Worst-Hour Leq(h), dBA	Modeled No Build Worst-Hour Leq(h), dBA	No Build Impact Type* (S, A/E, or None)	Modeled Build (Ped Shift) Worst-Hour Leq(h), dBA	Leq(h), dBA Increase (+) or Decrease (-)	Build (Ped Shift) Impact Type* (S, A/E, or None)	Modeled Build (Most) Worst-Hour Leq(h), dBA	Leq(h), dBA Increase (+) or Decrease (-)	Build (Most) Impact Type* (S, A/E, or None)
MD1	B/66	1	65	66	A/E	66	+1	A/E	66	+1	A/E
MD2	B/66	1	63	64	None	64	+1	None	64	+1	None
MD3	B/66	1	64	65	None	65	+1	None	65	+1	None
MD4	B/66	1	64	65	None	65	+1	None	65	+1	None
MD5	B/66	1	64	65	None	64	0	None	65	+1	None
MD6	B/66	1	65	66	A/E	64	-1	None	65	0	None
MD7	B/66	1	60	61	None	61	+1	None	61	+1	None
MD8	B/66	1	65	66	A/E	64	-1	None	65	0	None
MD9	B/66	1	64	65	None	64	0	None	64	0	None
MD10	B/66	1	64	65	None	64	0	None	64	0	None
MD11	B/66	1	64	65	None	63	-1	None	64	0	None
MD12	B/66	1	63	64	None	62	-1	None	63	0	None
MD13	B/66	1	65	66	A/E	64	-1	None	65	0	None
MD14	B/66	1	64	65	None	62	-2	None	64	0	None
MD15	B/66	1	65	66	A/E	62	-3	None	64	-1	None
MD16	B/66	1	66	67	A/E	62	-4	None	65	-1	None
MD17	B/66	1	65	66	A/E	61	-4	None	63	-2	None
MD18	B/66	1	66	67	A/E	60	-6	None	63	-3	None
MD19	B/66	1	65	66	A/E	59	-6	None	60	-5	None
MD20	C/66	Beach Park	66	67	A/E	58	-8	None	52	-14	None
MD21	B/66	1	64	65	None	62	-2	None	46	-18	None
MD22	B/66	1	56	57	None	57	+1	None	45	-11	None
MD23	B/66	1	57	58	None	58	+1	None	45	-12	None
MD24	B/66	1	58	59	None	58	0	None	45	-13	None
MD25	B/66	1	59	60	None	60	+1	None	45	-14	None
MD26	B/66	1	61	62	None	61	0	None	46	-15	None
MD27	B/66	1	62	62	None	62	0	None	47	-15	None
MD28	B/66	1	62	63	None	63	+1	None	47	-15	None
MD29	B/66	1	64	65	None	64	0	None	48	-16	None
MD30	B/C/66	1 + Beach Park	66	67	A/E	67	+1	A/E	49	-17	None

Site ID	Land Use Activity/HDOT Noise Abatement Category (Criterion)* Leq(h), dBA	Number of Receivers Represented	Modeled Existing Worst-Hour Leq(h), dBA	Modeled No Build Worst-Hour Leq(h), dBA	No Build Impact Type* (S, A/E, or None)	Modeled Build (Ped Shift) Worst-Hour Leq(h), dBA	Leq(h), dBA Increase (+) or Decrease (-)	Build (Ped Shift) Impact Type* (S, A/E, or None)	Modeled Build (Most) Worst-Hour Leq(h), dBA	Leq(h), dBA Increase (+) or Decrease (-)	Build (Most) Impact Type* (S, A/E, or None)
MD31	B/66	1	66	66	A/E	66	0	A/E	53	-13	None
MD32	B/66	1	66	66	A/E	66	0	A/E	55	-11	None
MD33	B/66	1	65	66	A/E	66	+1	A/E	56	-9	None
MD34	B/66	1	65	66	A/E	66	+1	A/E	57	-8	None
MD35	B/66	1	61	62	None	62	+1	None	59	-2	None
MD36	B/66	1	61	62	None	62	+1	None	60	-1	None
MD37	B/66	1	62	63	None	63	+1	None	61	-1	None
MD38	B/66	1	62	63	None	63	+1	None	61	-1	None
MD39	B/66	1	63	64	None	64	+1	None	63	0	None
MD40	B/66	1	63	64	None	64	+1	None	63	0	None
MD41	B/66	1	64	65	None	65	+1	None	63	-1	None
MD42	B/66	1	64	64	None	64	0	None	63	-1	None
MD43	B/66	1	44	45	None	46	+2	None	49	+5	None
MD44	B/66	1	63	64	None	64	+1	None	64	+1	None
MD45	B/66	1	44	45	None	45	+1	None	51	+7	None

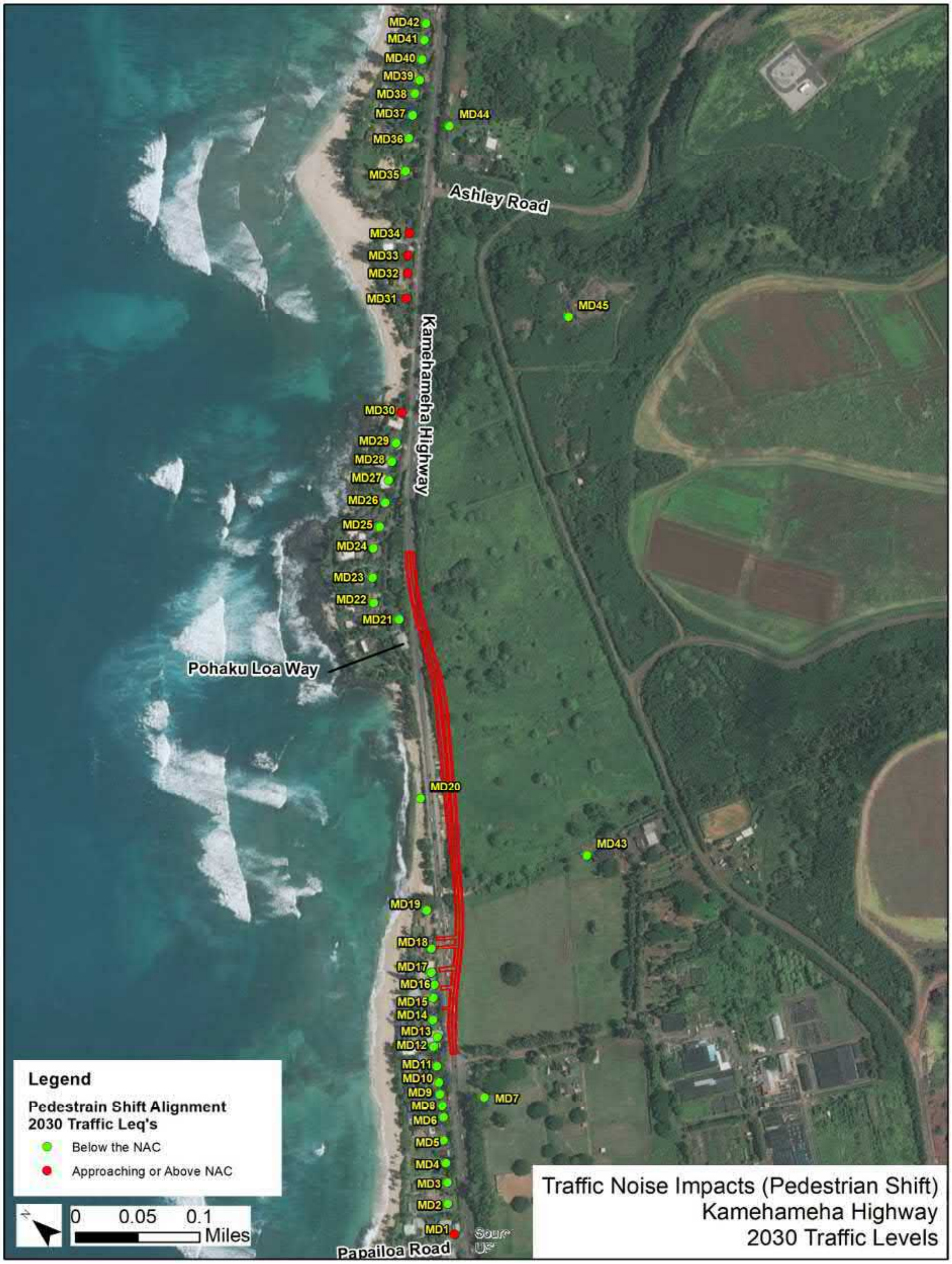
Note: See Table 3-1 for descriptions of Land Use Activities and Noise Abatement Categories.
Bold = level approaches or exceeds the NAC.
A “Receiver” is an area of frequent human outdoor activity, homes, apartments, motel, hotels, etc.
*Impact Type: S = Substantial Increase (15 dBA or more), A/E = Approach or Exceed NAC
Sites that begin with letters are modeled only sites.

Figure 4-1. Predicted Future No Build Worst-Hour Traffic Noise Levels



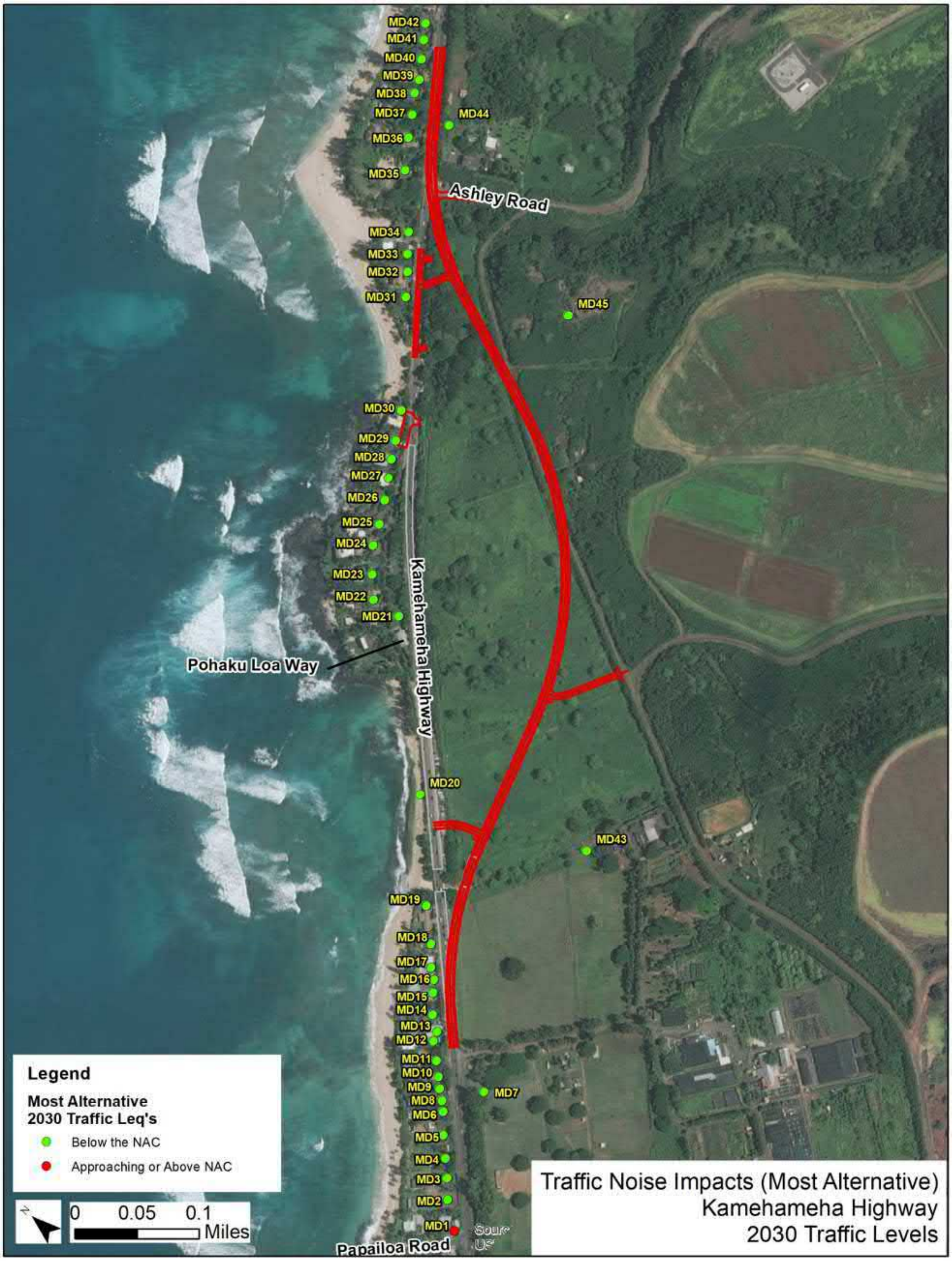
Source :WSP, 2020

Figure 4-2. Predicted Future Build ("Pedestrian Shift" Alternative) Worst-Hour Traffic Noise Levels



Source :WSP, 2020

Figure 4-3. Predicted Future Build ("Most Realignment" Alternative) Worst-Hour Traffic Noise Levels



Source :WSP, 2020

CHAPTER 5
CONSTRUCTION NOISE IMPACTS

The duration and level of construction noise depend on the phase and type of activity, such as:

- Ground clearing and excavation;
- Removal of existing trees, rocks and soil;
- Placement of foundations and roadbeds;
- Erection of structures including bridges and retaining walls; and
- Finishing, including filling, grading, paving, landscaping and cleanup operations.

Early construction work including ground clearing and excavation, typically generate the highest noise levels. Noise generated by construction equipment, including trucks, graders, excavators, bulldozers, concrete mixers, and portable generators can reach levels from 78 dBA to 91 dBA at 50 feet. Construction equipment noise emissions are regulated by the Environmental Protection Agency's Noise Control Program (Part 204 of Title 40, Code of Federal Regulations). Presently, air compressors are the only equipment under regulation and no new regulations are currently under consideration.

Noise levels for equipment which might be used during the excavation and construction of the proposed Project are presented in Table 5-1. The noise levels presented are at a reference distance of 50 feet. Since construction equipment noise levels decrease at a rate of approximately 6 dBA per doubling of distance, at 100 feet the noise levels would be about 6 dBA less than the levels shown at 50 feet. Similarly, at 200 feet the noise levels would be 12 dBA less than shown. Intervening structures or topography can act as a noise barrier to further reduce noise levels.

Table 5-1. Construction Equipment Noise Levels

Equipment	Decibels	Equipment	Decibels
Standard Construction Equipment		Compressor	81
Dump Truck	78	Generator	78
Saw	78	Grader	91
Light Tower	62	Water Truck	75
Cold Planer	80	Crane	71-93
Paving Machine	82	Light Impact Equipment	
Roller	63	Jack Hammer	100
Striping machine	85	Jumping Jack	100
Concrete Truck	70 – 95	Heavy Impact Equipment	
Backhoe/Loader	73 – 83	Hoe rams	95 – 106
Compressor	81	Vibratory Sheet pile driver	90 – 100
Pavement Saw	90	D9 Bulldozer	85
		Drill Rig	85

Source: Federal Highway Administration, Highway Construction Noise: Measurement, Prediction, and Mitigation, 1976

The State of Hawaii Department of Health (DOH) maintains community noise control standards that apply to construction noise. Construction activities for the Project could not exceed the stipulated noise limits unless a variance is granted by the DOH.

The following are anticipated conditions of the Noise Variance, which will be finalized upon its issuance.

The Noise Variance application will grant permission for the Contractor to work from:

- Sunday: 7:00 a.m. to Monday 6:00 a.m.
- Monday: 8:00 p.m. to Tuesday 6:00 a.m.
- Tuesday: 8:00 p.m. to Wednesday 6:00 a.m.
- Wednesday: 8:00 p.m. to Thursday 6:00 a.m.
- Thursday: 8:00 p.m. to Friday 6:00 a.m.

Subject to the following conditions during the variance hours:

- The Contractor shall make every effort to minimize noise emanating from the Project.
- The use of reverse signal alarms shall be prohibited during the variance hours. Alternative methods such as utilizing a ground guide for signaling shall be employed.
- Traffic noise from heavy vehicles traveling to and from the construction site shall be minimized near residences.
- The Contractor shall have a job-site inspector to whom immediate complaints can be forwarded for prompt response and who shall have the general responsibility of monitoring quiet work procedures.
- The Contractor shall give sufficient notice regarding the Project to any residents that may be impacted by the nighttime activity. The notification for the planned nighttime activity shall also contain the name and telephone number of the job-site inspector. In addition, a copy of any notifications, as well as progress reports, shall be sent to the Indoor and Radiological Health Branch.
- If noise level is such that the numerous complaints are received by the Department, the Contractor shall cease operations upon receipt of an order and complete the Project during hours on weekdays and weekends as directed.
- The Contractor shall notify the Indoor and Radiological Health Branch, State Department of Health, as to the date and time of any variance hour activity as soon as the dates are confirmed and also when the Project is completed.

Noise control measures during construction would be required to minimize impacts on existing noise sensitive land uses. Because impacts to residences cannot be accurately determined without detailed construction plans and schedules, the measures recommended in this section should be re-evaluated in greater detail as Project design is refined. General abatement measures presented below are recommended as guidelines in developing construction plans that consider the adverse impacts of construction noise.

- Design Considerations - During the early stages of construction plan development, strategic placement of stationary equipment, such as compressors and generators, can be considered for use as shielding against construction noise.
- Source Control - The Contractor shall comply with HDOT Standard Specifications and all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the job, or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the Project without a muffler.
- Community Relations - Community meetings can be held to explain the construction work, time involved, and the control measures to be taken to reduce the impact of the construction noise.

The aforementioned measures can be incorporated into site-specific construction plans in order to minimize noise impacts to sensitive receivers along the Project corridor, and additional noise emission limits could be developed as well. Construction hours could be set, different from those anticipated above, and noise level criteria could be decided upon and adhered to during construction.

CHAPTER 6
NOISE ABATEMENT MEASURES

Noise abatement measures must be considered as part of the Project if traffic noise impacts are identified and must be provided where it is feasible and reasonable to do so. Impacts occur at sites where traffic noise levels approach or exceed the NAC of Leq(h) 67 dBA, or substantially exceed (by 15 dBA or more) the ambient noise levels. HDOT's Highway Noise Policy and Abatement Guidelines (HDOT, 2016) are used to determine whether noise abatement measures can be implemented, depending on whether these measures are reasonable and feasible based on the following criteria:

- Provide at least 5 dBA highway traffic noise reduction for two thirds of front row receptors located along the subject Type I Project.
- Determination that it is possible to design and construct the barrier after considering issues related to safety, barrier height, topography, drainage, utilities, maintenance, maintenance access to adjacent properties, and access to adjacent properties.
- Consideration of viewpoints of the property owners and residents benefited by the barrier.
- Cost of noise abatement does not exceed $60,000 per benefited receptor.
- Achieve noise reduction design goal of 7 dBA for 75% of the benefited front-row receptors located along the subject Project.

6.1 NOISE ABATEMENT EVALUATION: NO BUILD ALTERNATIVE

The No-Build Alternative has 15 sites (14 residences and 2 formerly planned beach park areas) that would approach or exceed the NAC (Table 4-2). The No-Build Alternative is used as the baseline to compare future traffic noise levels. Noise abatement was not modeled for the No-Build alternative.

6.2 NOISE ABATEMENT EVALUATION: BUILD ALTERNATIVES

The "Pedestrian Shift" Build Alternative has 6 residences and one formerly planned park that would approach or exceed the NAC (Table 4-2). The 6 residences are represented by modeled sites MD1 and MD30 to 34 (Figure 4-2). The "Most Realignment" Alternative has 1 residence that would approach or exceed the NAC. The 1 residence is represented by modeled sites MD1. Each of the 6 sites predicted to experience impacts under either Project Alternatives were considered for noise abatement. Mitigation considerations include the feasibility of physically constructing noise mitigation (i.e., noise walls or barriers) to shield affected noise receptors from traffic noise in a way that would provide at least a 5-dBA traffic noise reduction. Noise barrier placement would not be feasible at all 6 sites that were predicted to experience noise impacts under either Project Alternative because access to private driveways and side streets that connect to Kamehameha Highway would have to be maintained and a barrier with such frequent openings could not provide a 5-dBA reduction. Therefore, no noise abatement, including noise barriers are proposed for either Project Alternative.

CHAPTER 7
CONCLUSIONS

7.1 FINDINGS

Existing traffic noise levels approach or exceed the NAC at five residences and at Laniakea Beach (at two areas closest to Kamehameha Highway). Future year 2030 modeled worst-hour traffic noise levels without the Project approach or exceed the NAC at 15 modeled sites that represent 14 residences and 2 formerly planned beach parks). 2030 modeled worst-hour traffic noise levels with the Project approach or exceed the NAC at 6 residences and 1 formerly planned park under the “Pedestrian Shift” Alternative and 1 residence under the ”Most Realignment” Alternative.

Noise abatement was considered at all 6 sites predicted to experience noise levels that approach or exceed the NAC with both Project Alternatives; however, noise abatement would not be feasible at all 6 locations.

7.2 INFORMATION TO LOCAL OFFICIALS

A copy of this report will be made available to the City and County of Honolulu DPP by HDOT. This report will serve to inform the Planning Department of the effects of the highway and highway-construction-related noise in the area studied. The information contained within this report can assist local officials in their planning process and help guide noise compatible planning concepts.

At the time of this report, several undeveloped or vacant lots are located with the Project noise study area. A review of zoning near the Project area and a review of current permits on file at the City and County of Honolulu Department of Public Works, Building Division identified no planned developments that would add noise-sensitive land uses in the noise study that arent included in this technical analysis.

Based on the modeling results and future traffic volumes and speeds included in this report, areas within 200 feet of Project improvements along Kamehameha Highway (for both alternative alignments) may experience noise levels that exceed the HDOT residential and recreational land use noise abatement criteria of 66 dBA. Commercial areas located within 50 feet of Kamehameha Highway (for both alternative alignments) may exceed the commercial abatement criteria of 71 dBA. It is recommended that the local officials use this information as a guide when developing future land use plans, zoning, or building code requirements. The use of this information may assist local government with future development plans and thereby result in development that is consistent with the noise environment.

CHAPTER 8
REFERENCES

Department of Planning; Online review of zoning maps near Kamehameha Highway Pedestrian Safety noise study area accessed December 19, 2019 at website: http://www.cohplanningdept.com/zone-maps/.

Building Division; Online review of building permits at parcels located with Kamehameha Highway Pedestrian Safety noise study area accessed, December 19, 2019 at website: http://qpublic9.qpublic.net/hi_Hawaii_search.php.

WSP USA; Kamehameha Highway Pedestrian Safety Traffic Evaluation, April 2020.

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U.S. Department of Transportation, Federal Highway Administration (FHWA), 1973. Fundamentals and Abatement of Highway Traffic Noise. Washington D.C.

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U.S. Department of Transportation, Federal Highway Administration (FHWA), 1998, 2004. FHWA Traffic Noise Model Users Guide. Washington D.C.

U.S. Department of Transportation, Federal Highway Administration (FHWA), 1996. Measurement of Highway-Related Noise. Washington D.C.

U.S. Environmental Protection Agency (EPA), 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Report Number 550/9-74-004.

U.S. Department of Transportation, Federal Highway Administration (FHWA), Regulations. CFR Title 23, Part 772 (http://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0772.htm).

United States Geological Survey (USGS), July 28, 2004. Last access online in March 2020 at: http://seamless.usgs.gov/website/seamless/index.asp.

CHAPTER 9
SUPPORTING DATA

Noise Measurement and Observed Traffic Data can be found here:

> Parsons Brinckerhoff; Kamehameha Highway Realignment Traffic Noise Monitoring; October 1 and 2, 2014

Traffic Noise Modeling (TNM) 2.5 Output Files can be found here:

> WSP USA; Kamehameha Highway Pedestrian Safety Traffic Noise Modeling files (Provided electronically)

Appendix

K

Preliminary Plans

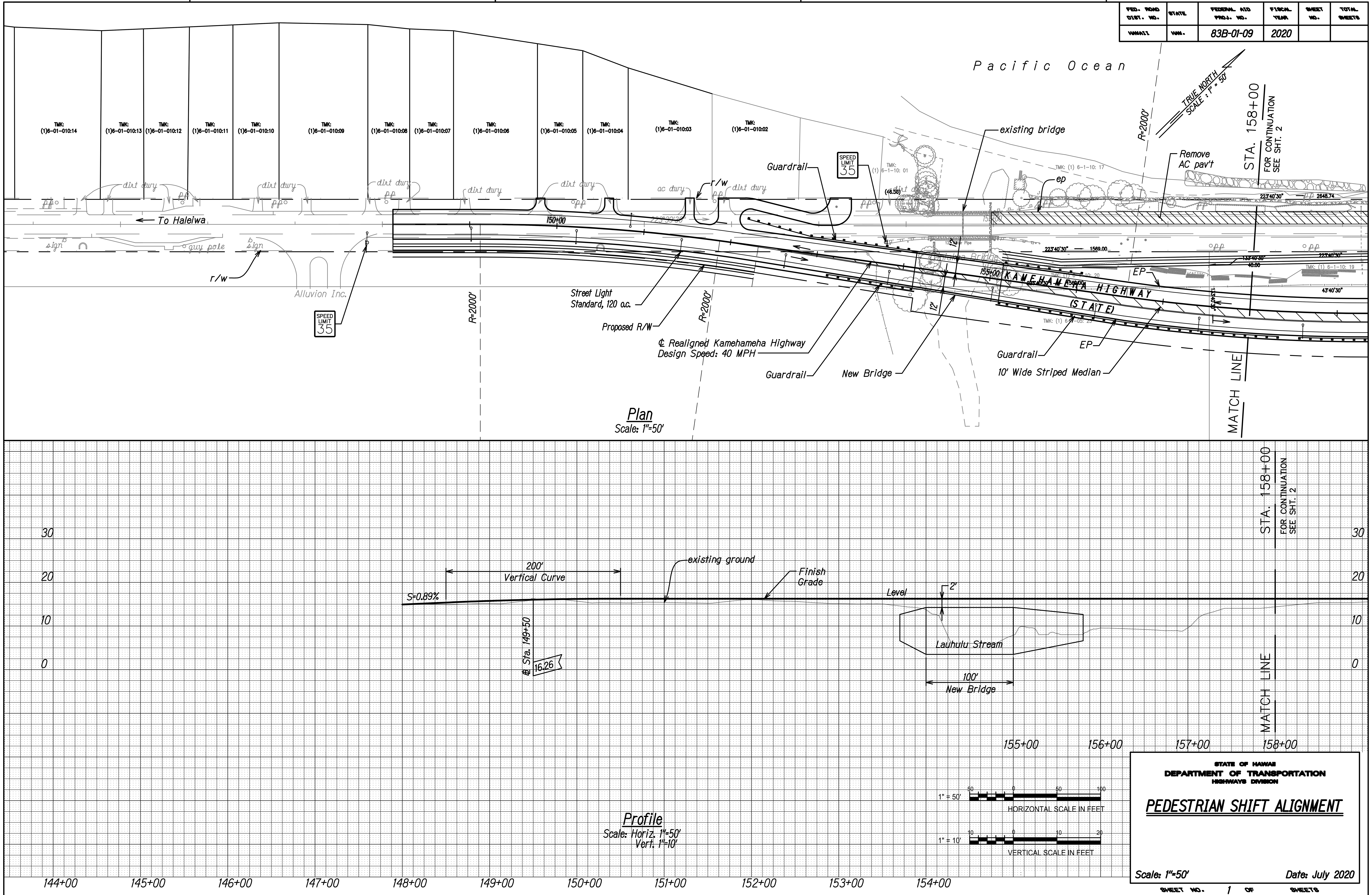
83B-01-09 | 2020

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTRIAN SHIFT ALIGNMENT

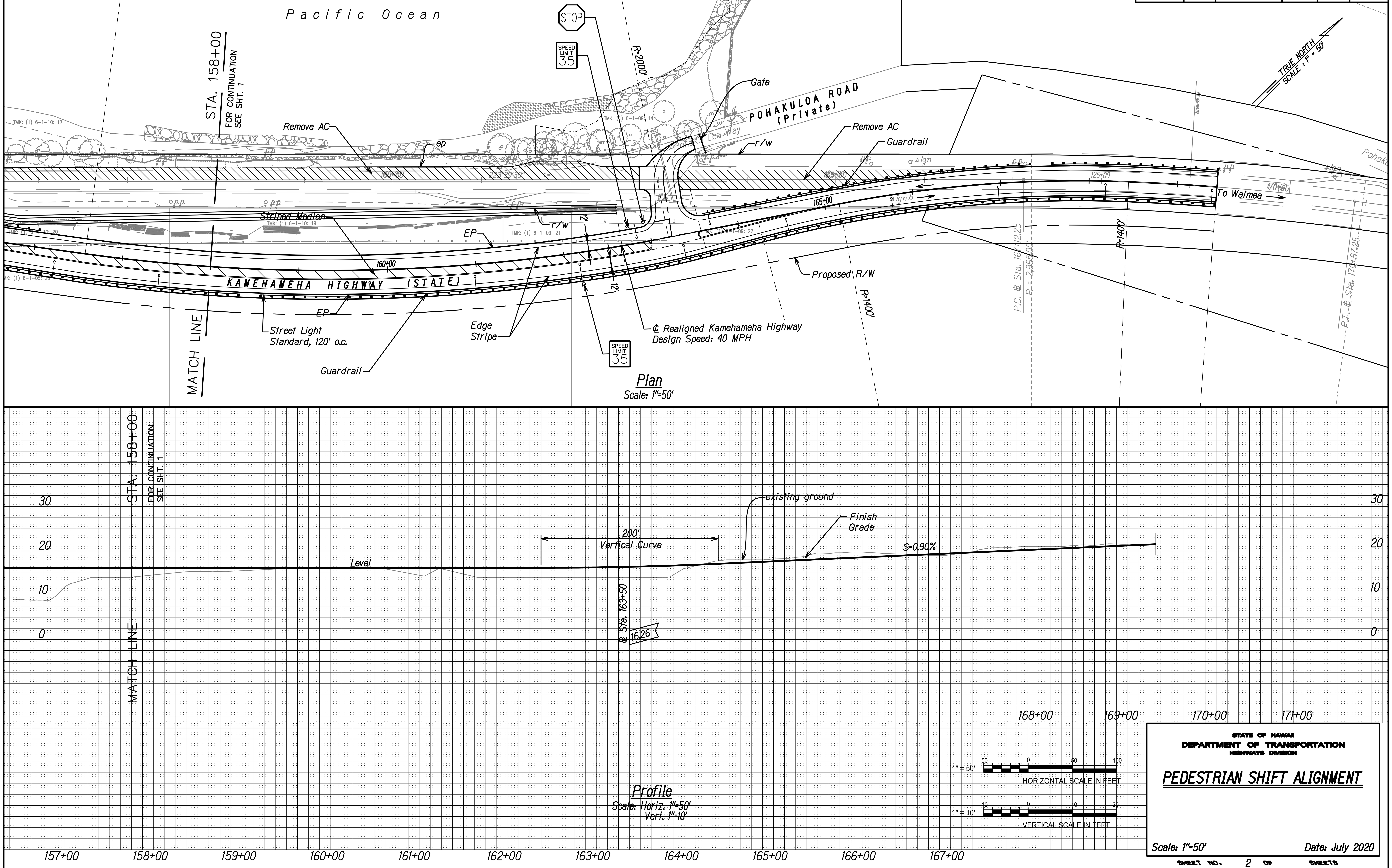
Scale: 1"=50' Date: July 2020

SHEET NO. 1 OF SHEETS



FED. ROAD DIST. NO.
STATE
FEDERAL AID PROJ. NO.
FISCAL YEAR
SHEET NO.
TOTAL SHEETS
HAWAII
HAW.
83B-01-09
2020
Pacific Ocean
TRUE NORTH SCALE : 1" = 50'
STA. 158+00
FOR CONTINUATION SEE SHT. 2
existing bridge
Remove AC pav't
ep
R=2000'
Guardrail
SPEED LIMIT 35
To Haleiwa
r/w
dirt dwy
ac dwy
150+00
155+00
sign
guy pole
Alluvion Inc.
Street Light Standard, 120 o.c.
Proposed R/W
℄ Realigned Kamehameha Highway
Design Speed: 40 MPH
New Bridge
KAMEHAMEHA HIGHWAY
(STATE)
EP
10' Wide Striped Median
12'
MATCH LINE
Plan
Scale: 1"=50'
30
20
10
0
200'
Vertical Curve
S=0.89%
existing ground
Finish Grade
Level
2'
℄ Sta. 149+50
16.26
Lauhulu Stream
100'
New Bridge
144+00
145+00
146+00
147+00
148+00
149+00
150+00
151+00
152+00
153+00
154+00
155+00
156+00
157+00
158+00
Profile
Scale: Horiz. 1"=50'
Vert. 1"=10'
1" = 50'
HORIZONTAL SCALE IN FEET
1" = 10'
VERTICAL SCALE IN FEET
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PEDESTRIAN SHIFT ALIGNMENT
Scale: 1"=50'
Date: July 2020
SHEET NO. 1 OF SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83B-01-09	2020		



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PEDESTRIAN SHIFT ALIGNMENT

Scale: 1"=50'

Date: July 2020

SHEET NO. 2 OF SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

Appendix

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Wetland Delineation Technical Report

H. T. HARVEY & ASSOCIATES

Ecological Consultants

50 years of field notes, exploration, and excellence

Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach Wetland Delineation Technical Report

Project # 4593-01

Prepared for:

WSP USA
1001 Bishop Street, Suite 2400
Honolulu, HI 96813

Prepared by:

H. T. Harvey & Associates

December 14, 2021

Table of Contents

Tables

Figures

Appendices

List of Preparers

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Linda Koch, M.S., Aquatic Ecologist

Section 1.0 Project Introduction and Purpose

1.1 Project Description

The State of Hawaii Department of Transportation, Highways Division is proposing roadway improvements to address pedestrian safety, shoreline erosion, congestion, and roadway reliability along Kamehameha Highway (Route 83) in the vicinity of Laniakea Beach on the island of Oahu (Figure 1). The project reach is approximately 1,000 feet in length and lies at the Northeast end of Laniakea Beach. As pedestrian safety is the primary purpose, the proposed project is referred to as the "Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach". Four alternatives are evaluated in the Environmental Assessment for the project. The Pedestrian Shift Alternative is the preferred alternative and generally consists of realigning Kamehameha Highway mauka (inland) up to 80 feet from its current location from the Haleiwa side of Lauhulu Stream bridge for roughly 1,100 feet.

1.2 Survey Scope and Purpose

The proposed new 100 foot bridge inland from the existing Lauhulu Stream bed will not impact the Lauhulu Stream bed and bank as the piers will be outside the stream channel and there is no central pier. The scope of this survey was therefore limited to an area of approximately 0.8 acres northeast of the Lauhulu Stream bed that overlaps the mapped National Wetlands Inventory (NWI) features and the preferred alternative being evaluated in the Environmental Assessment for the project (Figures 2 and 3).

The purpose of the field survey was to identify the extent and distribution of potentially jurisdictional features, such as wetlands and other waters, occurring within the study area under conditions existing at the time of the survey on November 11, 2021. H. T. Harvey & Associates surveyed the entire study area for features that may meet the physical criteria and regulatory definition of "waters of the United States" (jurisdictional waters) under Section 404 of the Clean Water Act, as well as Section 10 of the Rivers and Harbors Appropriation Act of 1899.

1.3 Site Description

The project site lies within the Laniakea watershed along the northwestern part of Oahu (Figure 1). Situated on the coast line, it is bound by the Pacific Ocean and the Laniakea Beach to the northwest and the towns of Haleiwa and Pupukea to the southwest and northeast respectively. The southeastern side of the site is mostly comprised of ranch land. Lauhulu Stream (also referred to as Laniakea Stream or Kukaiohiki Gulch), flows under the existing Lauhulu Stream Bridge and empties into Laniakea Beach in the southern part of the project site.

The climate at the project site is characterized as moderately dry and sunny. According to the Online Rainfall Atlas of Hawaii (Giambelluca et al. 2013), the area receives a mean annual rainfall of approximately 36 inches.

Rainfall is typically highest in January and lowest in June-July (Giambelluca et al. 2013). The topography at the project site is gently sloping from southeast to the northwest (Figure 4) with elevations ranging between about 21 feet above mean sea level (msl) at the mauka (inland) extent to about 6 feet above msl at the makai (ocean side) extent of the site.

Figure 5 shows the soil unit mapped by the Natural Resources Conservation Service (NRCS) within the study area, and Table 1 summarizes the associated texture, drainage classification, landform setting, and hydric soil status (NRCS 2021a) for the one soil type found within the study area.

Table 1. Soil Type, Texture, Drainage Classification, and Hydric Status for the Seven Soil Types Occurring in the Study Area

Soil Symbol	Soil Name	Soil Texture	Drainage Classification	Landform	Hydric Status
WkA	Waialua Silty Clay, 0 to 3 percent slopes	Silty Clay	Moderately Well drained	Alluvial Fans, Footslope, Side-slope, Rise	No

The U.S. Fish and Wildlife Service's NWI map of the study area is depicted in Figure 3. The NWI identified two aquatic feature within the study area (NWI 2021). The Lauhulu Stream bed and bank is mapped as estuarine and marine deepwater and a segment adjacent to this feature and almost parallel the Highway is mapped as estuarine and marine wetland.

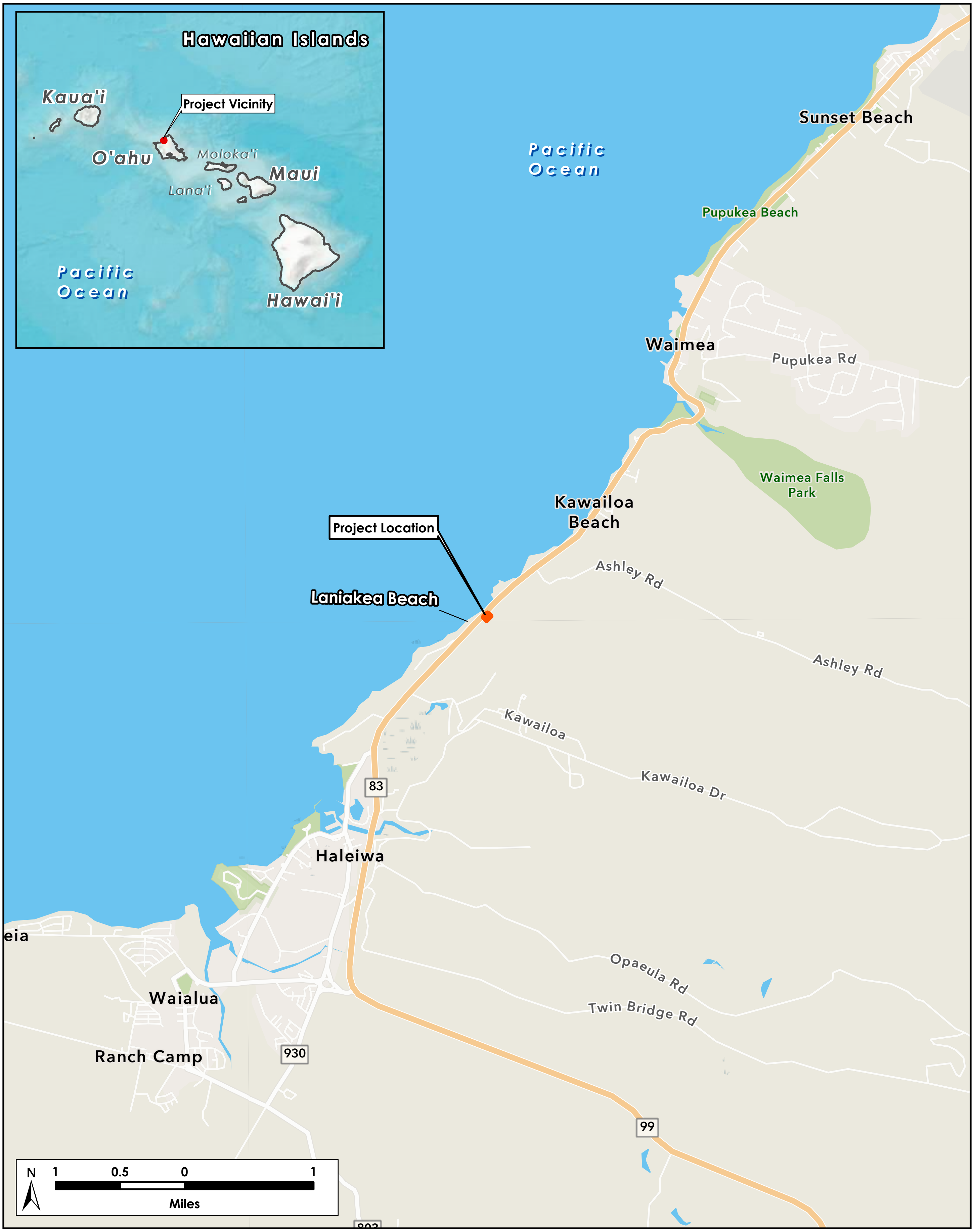

Figure 1. Project Vicinity Map

Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)

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Figure 2. Study Area
Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)
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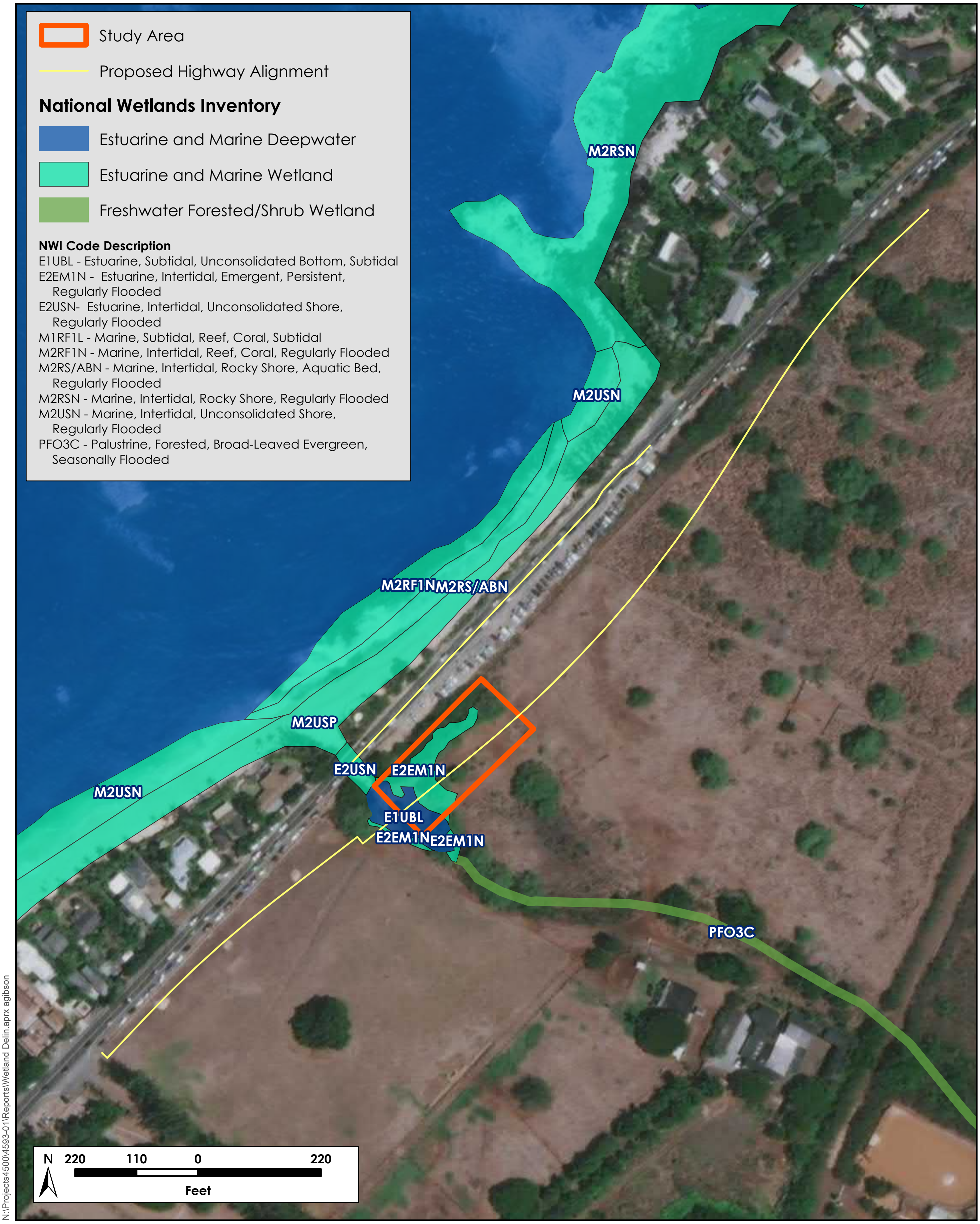

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Figure 3. National Wetlands Inventory Map

Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)

December 2021

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Figure 4. U.S. Geological Survey Topographic Map
Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)
December 2021

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Figure 5. Natural Resources Conservation Service Soils Map
Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)
December 2021

Section 2.0 Survey Methods

Before the survey was conducted, H. T. Harvey & Associates reviewed topographic maps and current and historical aerial photos of the project site. These sources included the U.S. Geological Survey (USGS) topographic map, NWI, Google Earth software (Google Inc. 2021), Hawaii Watershed Atlas (Parham et al. 2008), and State of Hawaii GIS data for streams (Office of Planning 2017). With background information gleaned from these sources, on November 11, 2021, H. T. Harvey & Associates' plant ecologist and certified wetland delineator, Shahin Ansari and aquatic biologist Linda Koch, performed a technical determination of Section 404 wetland and other waters in the 0.8 acre study area (Figure 2). The technical determination was performed in accordance with the *U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual* (Corps Manual) (Environmental Laboratory 1987). In addition, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and Pacific Region (Version 2.0)* (Regional Supplement) (USACE 2012) was followed to document site conditions relative to hydrophytic vegetation, hydric soils, and wetland hydrology.

During the survey, the study area was examined for topographic features, drainages, alterations to site hydrology or vegetation, and recent significant disturbance. A determination was then made as to whether normal environmental conditions were present at the time of the field survey. In the field, the techniques used to identify wetlands included digging soil pits to sample soil from various depths, observing the vegetation growing near the soil sample points, and characterizing the current surface and subsurface hydrologic features present near the sample points through both observation of indicators and direct observation of hydrology. A Trimble GeoXT™ GPS unit capable of submeter accuracy was used to record data during the technical determination. The following sections present descriptions of the methods used to identify Section 404 jurisdictional waters (wetlands and other waters).

2.1 Identification of Section 404 Jurisdictional Wetlands (Special Aquatic Sites)

Where wetland field characteristics were present, the surveyors examined vegetation, soils, and hydrology using the Routine Determination Method outlined in the Corps Manual (Environmental Laboratory 1987) and the updated data forms, vegetation sampling methods, and hydric soil and hydrology indicators developed for the Hawaii and Pacific Islands Regional Supplement (USACE 2012).

2.1.1 Hydrophytic Vegetation

Plants that can grow in soils that are saturated or inundated for long periods of time, which contain little or no oxygen when wetted, are considered adapted to those soils and are called hydrophytic. There are different levels of adaptation, as summarized in Table 2. Some plants can only grow in soils saturated with water (and depleted of oxygen), some are mostly found in this condition, and some are found equally in wet soils and in dry soils. Plants observed at each of the sample sites were identified to species, where possible, using the *Manual of Flowering Plants of Hawaii Revised Edition* (Wagner et al. 1999) and the *Hawaiian Vascular Plants Checklist February*

2019 Update (Imada 2019). The wetland indicator status of each species was obtained from the *Hawaii and Pacific Islands Regional Wetland Plant List* (Lichvar et al. 2016). Wetland indicator species are designated according to their frequency of occurrence in wetlands. For instance, a species with a presumed frequency of occurrence of 67 to 99% in wetlands is designated a facultative wetland indicator species. The wetland indicator groups, indicator symbol, and the frequencies of occurrence of species within wetlands, provided as a percentage, are shown in Table 2.

Table 2. Wetland Indicator Status Categories for Vascular Plants

Indicator Category	Symbol	Frequency (%) of Occurrence in Wetlands[1]
Obligate	OBL	>99 (Almost always is a hydrophyte, rarely in uplands)
Facultative wetland	FACW	67 – 99 (Usually a hydrophyte but occasionally found in uplands)
Facultative	FAC	34 – 66 (Commonly occurs as either a hydrophyte or non-hydrophyte)
Facultative upland	FACU	1 – 33 (Occasionally is a hydrophyte, but usually occurs in uplands)
Upland	UPL	<1% (Rarely is a hydrophyte, almost always in uplands)
Not Listed	NI	Considered to be an upland species

[1] Based on information contained in the Corps Manual (Environmental Laboratory 1987). Plant species that are not listed in the Hawaii and Pacific Islands Regional Wetland Plant List (Lichvar et al. 2016) are considered UPL species in Appendix A – Plants Observed in the Study Area

Obligate and facultative wetland indicator species are hydrophytes that occur "in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987). Facultative indicator species may be considered wetland indicators when found growing in hydric soils that experience periodic saturation. Plant species that are not on the regional list of wetland indicator species are considered upland species. A complete list of the vascular plants observed within the study area, including their current indicator statuses, has been provided in Appendix A.

2.1.2 Hydric Soils

Up to 17 inches of the soil profile were examined for hydric soil indicators. The National Technical Committee for Hydric Soils defines a hydric soil as one formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper 12 inches of soil (NRCS 2018). Hydric soils include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. In general, evidence of a hydric soil includes characteristics such as reducing soil conditions, soils with bright mottles and/or low matrix chroma, and soils listed as hydric by the U.S. Department of Agriculture on the National Hydric Soils List (NRCS 2021b). Reducing soil conditions can also include circumstances where there is evidence of frequent ponding for long or very long duration. A long duration is defined as a period of inundation for a single event that ranges from 7 days to a month and very long is greater than one month (Environmental Laboratory 1987).

Munsell Soil Notations (Munsell 2009) were recorded for the soil matrix of each soil sample. The Munsell color system is based on three color dimensions: hue, value, and chroma. A brief description of each component of the system is described below, in the order they are used in describing soil color (i.e., hue/value/chroma):

1. **Hue—**The Munsell Soil Color Chart is divided into five principal hues: yellow (Y), green (G), purple (P), blue (B), and red (R), along with intermediate hues such as yellow-red (YR) and green-yellow (GY). Example of commonly encountered hue numbers include 2.5YR, 10YR, and 5Y.
2. **Value—**Refers to lightness, ranging from white to grey to black. Common numerical values for value in the Munsell Soil Color Chart range from 2 for saturated soils to 8 for faded or light colors. Hydric soils often show low-value colors when soils have accumulated sufficient organic material to indicate development under wetland conditions, but can show high-value colors when iron depletion has occurred, removing color value from the soil matrix. Value numbers are commonly reported as 8/, 2.5/, and 6/.
3. **Chroma—**Describes the purity of the color, from "true" or "pure" colors to "pastel" or "washed out" colors. Chromas commonly range from 1 to 8, but can be higher for gleys. Soil matrix chroma values that are 1 or less, or 2 or less when mottling is present, are typical of soils that have developed under anaerobic conditions. Chroma numbers are listed, for example, as /1, /5, and /8.

The NRCS Web Soil Survey (NRCS 2021a) was consulted to determine which soil types have been mapped in the study area (Table 1, Figure 4). Detailed descriptions of these soil types are provided in Appendix B.

2.1.3 Hydrology

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Wetland hydrology indicators provide evidence that the site has a continuing wetland hydrologic regime. Primary indicators might include visual observation of surface water (A1), high water table (A2), water marks (B1), and hydrogen sulfide odor (C1). Secondary indicators might include a passing score for the FAC-neutral test (D5) and stunted or stressed plants (D1). Each of the sample points was examined for positive field indicators (primary and secondary) of wetland hydrology, following the guidance provided in the Regional Supplement.

2.2 Identification of Section 404 Jurisdictional Wetlands (Special Aquatic Sites)

Surveys were also conducted within the study area for "other waters", which includes lakes, slough channels, seasonal ponds, tributary waters, non-wetland linear drainages, and salt ponds. Such areas are identified by the (seasonal or perennial) presence of standing or running water and generally lack hydrophytic vegetation. In non-tidal or muted tidal waters, USACE jurisdiction extends to the ordinary high water mark, which is defined in 33 CFR Part 328.3 as "the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris." No potentially jurisdictional other waters were mapped within the study area.

Section 3.0 Survey Results and Discussion

Two vegetation types were observed within the study area: milo-kiawe thicket and pasture (Figure 6). Five sample points were examined to identify jurisdictional features (Figure 7; Appendix C). No potentially jurisdictional wetlands regulated by USACE were found within the study area. In March 2021, an investigation was conducted for this same project by WSP USA and LeGrande Biological Surveys, Inc. to determine if wetlands are present at the project site. The March 2021 investigation overlapped this November 2021 study area and also did not find any wetlands. However the March 2021 study was not verified by USACE.

Information assembled during this investigation and pertinent to the identification of jurisdictional wetlands is presented in the first four appendices of this report.

- Appendix A—Plants Observed in the Study Area
- Appendix B—NRCS Soil Survey for Island of Oahu, Hawaii
- Appendix C—USACE Hawaii and Pacific Island Wetland Determination Data Forms
- Appendix D—Photos of the Study Area

3.1 Observations, Rationales, and Assumptions

Site conditions observed during the delineation survey are reported here, along with pertinent background information and precipitation data.

3.1.1 Background Information

The preliminary delineation assumes that relatively normal circumstances prevailed at the time of the November 2021 survey, and results are based upon the conditions present at the time of the survey. The survey was performed using the "Routine Method of Determination" using three parameters, as outlined in the Regional Supplement.

The study area falls within Haleiwa USGS 7.5-minute quadrangle. Elevation at this nearshore study area ranges from about 10 to 20 ft above msl (Figure 3). The topography of the study area is gently undulating. The central portion of the study are is somewhat low lying relative to the southeastern and the northwestern edges. The topography naturally slopes from southeastern (inland/pasture side) to the northwestern (ocean/ Kamehameha Highway side). The northwestern border of the study area which parallels the Kamehameha Highway overlaps a roadside swale and is about three to four feet lower than the Kamehameha Highway. The milo-kiawe thicket vegetation type occurs in this swale which abruptly transitions in the southeast direction to pasture land.

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Figure 6. Habitats and Photo Points
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December 2021

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Figure 7. Areas Not Meeting the Regulatory Definition of Waters of the U.S.
Kamehameha Highway Pedestrian Safety Project, Vicinity of Laniakea Beach (4593)
December 2021

3.1.2 Precipitation Data

The survey took place in early November 2021, at the beginning of the rainy season in Hawaii. The 30-year (1987-2007) average annual precipitation for the study area obtained from the Online Rainfall Atlas of Hawaii (Giambelluca et al. 2013) is approximately 36 inches. The 30-year average monthly precipitation in October and November at the study area is 3.25 and 4.14 inches respectively. In general the weather conditions at the study site are hot and dry.

Based on the USGS Pupukea Road rain gauge station, the average year to date precipitation from January to October is 59.91 inches (National Weather Service 2021). The average year to date precipitation as recorded at this station from January to October 2021; during the 10 months leading up to the survey on November 11, 2021 was 72.08 inches. Although this Pupukea Road rain gauge is closest to the study area it should be noted that it is 4.6 miles away and at a much higher elevation of 1160 feet and probably does not reflect the precipitation in the study area. However the data indicates that area upland of the study area received more (120%) than the average year to date precipitation during the months leading up to this survey. Based on anecdotal data from the local area residents, the study area did not receive any rainfall in several weeks leading up to the survey in early November. At the study area, the year started out with very wet storm events in the months of January, February, and March. This was followed by less than below average precipitation in spring and summer, slightly increasing in September and October. At the time of this survey the study area was very dry and no standing water was observed.

3.1.3 Site Conditions and Observations

The vast majority of the study area is located in an overgrazed pasture (Figure 6). Other than a few kiawe trees (*Prosopis pallida*), the pasture was composed of low, overgrazed stubbles of herbaceous weedy species such as kikuyu grass (*Pennisetum clandestinum*), Bermuda grass (*Cynodon dactylon*) and Jamaican vervain (*Stachytarpheta jamaicensis*) scattered on the bare hardened ground. There were cattle present and manure was common in the study area. There was mostly bare ground under the milo-kiawe thicket with some haole koa (*Leucaena leucocephala*) and guinea grass (*Megathyrsus maximus*) toward the Highway.

Along the southwestern border, the site adjacent to the study area is composed of the Lauhulu Stream bed or the Kukaiohiki Gulch. This site which is outside of the study area is noteworthy because of the presence of a large pool of water in the Lauhulu Stream bed (Appendix D, Photos 1 and 6.) that was being fed by a stream trickling within the channel. Lauhulu Stream is an intermittent stream which flows only during heavy rain storms. Since it had not rained for several weeks leading up to this survey and also given the very dry conditions in the study area, this hydrology appeared to be unnatural and was further investigated with the ranch owner Mr. Bobby Robinson. The source of the flowing water was determined to be an overflowing water tank in the ranch approximately about 1000 ft above the study area. Mr. Robinson described a malfunction with the pump and flow control mechanism of the water system that resulted in substantial overflow. The overflow was documented and photographed (Appendix D, Photo 7). The Lauhulu Stream bed above the (overflowing) water tank location was examined to confirm that it was dry (Appendix D, Photo 8). In addition, near Mr.

Robinson's property, the surface flow from the overflowing water tank was observed flowing into the dry stream bed (Appendix D, Photos 9 and 10). Mr. Robinson noted that the water tank had been leaking for several months which probably contributed to the large and deep (~ two feet) pool over time. This inundated stream bed from this flow however, did not create or sustain any wetland habitat within the study area.

3.1.4 Rationale for Sample Point Choice

Five sample points were selected to document conditions in representative habitats (Figure 7). Rationale and findings for wetland data form sample points are summarized in Table 3.

Table 3. Summary of Sample Point Locations and Results

Name	Sampling Rationale	Hydrophytic Vegetation	Hydric Soil?	Wetland Hydrology?	Overall Wetland Assessment
SP1	Placed in the pasture close to inundated Lauhulu Stream bed (outside of study area) to investigate NWI feature—Estuarine and Marine Deepwater.	No	No	No	This area did not meet the three parameter wetland criteria.
SP2	Placed in the pasture slightly higher to SP-1 to investigate NWI feature—Estuarine and Marine Wetland.	No	No	No	This area did not meet the three parameter wetland criteria.
SP3	Placed to investigate a relatively low lying area in the pasture that appeared to be an area where water probably ponds during heavy rain storms.	No	No	No	This area did not meet the three parameter wetland criteria.
SP4	Placed to investigate the milo-kiawe thicket under the canopy of kiawe (*Prosopis pallida*) trees.	No	No	No	This area did not meet the three parameter wetland criteria.
SP5	Placed to investigate the milo-kiawe trees thicket under the canopy of milo (*Thespesia populnea*) trees.	No	No	No	This area did not meet the three parameter wetland criteria.

3.1.5 Photo Points

Photo point labels, coordinates, and rationales for photo documentation are presented in Table 4 and depicted on Figure 6. Photos are presented in Appendix D.

Table 4. Coordinates and Rationale for Photo Points

Label	Latitude, Longitude	Depiction
Photo 1	21°37'1.13"N, 158°5'11.02"W	Area adjacent (about 25 inches from the surface water) to the inundated Lauhulu Stream bed. Determined not to be a 3-parameter wetland (PP-1). Looking southwest.

Label	Latitude, Longitude	Depiction
Photo 2	21°37'1.11"N, 158°5'10.64"W	Point taken on slightly higher ground in the pasture above SP-1(PP-2) – looking southeast. Looking southwest.
Photo 3	21°37'1.63"N, 158°5'9.43"W	Point taken in a relatively low lying area in the pasture (PP-3). Determined not to be a wetland. Looking northeast.
Photo 4	21°37'2.27"N, 158°5'9.81"W	Point taken under the kiawe trees of the kiawe-milo thicket looking northeast (PP-4). Looking northeast.
Photo 5	21°37'1.71"N, 158°5'10.80"W	Point taken under the milo (*Thespesia populnea*) trees of the kiawe-milo thicket. Looking northwest toward the highway.

3.2 Areas Not Meeting the Regulatory Definition of Waters or the U.S.

During this survey none of the features identified at the five sampling points meet the requirements for jurisdictional wetlands. The entire 0.8 acres of the study area did not meet the regulatory definition of wetlands or waters of the U.S. and is identified as upland. Besides milo (FAC) trees, the other dominant plant species in the pasture and the milo-kiawe thicket vegetation types of the study area are either facultative upland or upland plants (e.g. Bermuda grass, kikuyu grass, kiawe, and cocklebur).

SP-1 was dug at the southwestern border of the study area close to the water ponding in the Lauhulu Stream bed. This artificial ponding caused due to water overflowing from a malfunctioning water tank upland of the study area did not contribute to any wetland features in spite of the proximity of SP-1 to the surface water.

NWI depicts the southwestern boundary of the study area, adjacent to the Lauhulu Stream bed, as estuarine, subtidal, unconsolidated bottom, subtidal. Areas adjacent to this feature, as well as the swale (parallel to Highway) is depicted as estuarine, intertidal, emergent, persistent, regularly flooded (Figure 5). These areas were investigated during this survey and did not exhibit surface hydrologic connections, did not have hydric soils, did not have presence of wetland plants, or indicators of regular surface flows such as the presence of ordinary high water marks; as such these features were not considered jurisdictional. NWI maps are based on interpretation of aerial photography, limited verification of mapped units, and/or classification of wetland types using the classification system developed by Cowardin et al. (1979). These data are available for general reference purposes and do not necessarily correspond to the actual presence or absence of jurisdictional waters. It should however be noted that portions of study area sometimes do flood during periods of high surf when the sea water splashes over across the Highway into the study area. Also, low lying portions of the study area sometimes pond during high rain storm events. It is possible that the NWI features depicted in the study area were recorded at a time when the study area was flooded.

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Appendix A. Plants Observed in the Study Area

Family	Scientific Name	Common Name	Wetland Indicator Code[1]
Poaceae	*Cynodon dactylon*	Bermuda grass	FACU
	Megathyrsus maximus	Guinea grass	FAC
	Pennisetum clandestinum	Kikuyu grass	UPL
Anacardiaceae	*Schinus terebenthifolius*	Christmas berry	FACU
Asteraceae	*Verbesina encelioides*	Golden crown-beard	FACU
	Xanthium strumarium	Cockelbur	FACU
Fabaceae	*Acacia farnesiana*	Klu	UPL
	Leucaena leucocephala	Haole koa	UPL
	Prosopis pallida	Kiawe	FACU
Malvaceae	*Thespesia populnea*	Milo	FAC
Verbenaceae	*Stachytarpheta jamaicensis*	Jamaica vervain	FACU

[1]FACU=Facultative Upland, FAC=Facultative, UPL=Upland

Appendix B. Natural Resources Conservation Service Soil Survey for Island of Oahu, Hawaii

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Island of Oahu, Hawaii

Kam Hwy Shoreline Alignment Project

November 10, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

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 Oahu, Hawaii
Survey Area Data: Version 16, Sep 15, 2021

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

Date(s) aerial images were photographed: Jan 29, 2017—Oct 11, 2020

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
BS	Beaches	0.5	10.6%
WkA	Waialua silty clay, 0 to 3 percent slopes	4.6	89.4%
Totals for Area of Interest		**5.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Island of Oahu, Hawaii

BS—Beaches

Map Unit Setting

National map unit symbol: hqd1
Elevation: 0 to 10 feet
Mean annual precipitation: 10 to 75 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Beaches: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beaches

Setting

Landform: Beaches
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex

Typical profile

H1 - 0 to 6 inches: coarse sand
H2 - 6 to 60 inches: coarse sand

Properties and qualities

Slope: 1 to 5 percent
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Calcium carbonate, maximum content: 99 percent
Maximum salinity: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydric soil rating: No

WkA—Waialua silty clay, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hqjc

Elevation: 10 to 100 feet
Mean annual precipitation: 25 to 50 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Waialua and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waialua

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium

Typical profile

H1 - 0 to 12 inches: silty clay
H2 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R158XY401HI - Isohyperthermic Ustic Naturalized Grassland
Hydric soil rating: No

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Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where "Rock outcrop" is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Appendix C. U.S. Army Corps of Engineers Hawaii and Pacific Island Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Hawaiʻi and Pacific Islands

Project/Site: Kam Hwy Realignment Vicinity of Laniakea City: Haleiwa Sampling Date: 11.11.2021 Time: 11 am

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP-1

Investigator(s): Shahin Ansari and Linda Koch TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: ______ Long: ______ Datum: ______ Slope (%): ______

Soil Map Unit Name: Waialua Silty Clay , 0 to 3 percent slope NWI classification: E1UBL (Estuarine and Marine Deep Water)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No X (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No X	**Is the Sampled Area within a Wetland?**	**Yes** ______ **No** X
Hydric Soil Present?	Yes ______ No X		
Wetland Hydrology Present?	Yes ______ No X		

Remarks:
There is a large pool of standing water in the Lauhulu Stream bed southwest of the study area even though it has not rained at this site for several weeks prior to this survey. Talking with the ranch owner we found out that his water tank above the study area has been leaking for few months which has been contributing to the observed ponding in the stream bed.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10 ft x 10 ft)			
1. *Prosopis pallida*	25	X	FACU
2. *Thespesia populnea*	5		FAC
3.			
4.			
5.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft x 5 ft)			
1. *Xanthium strumarium*	15	X	FACU
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Cynodon dactylon*	30	X	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	5	x 3 = 15
FACU species	70	x 4 = 280
UPL species		x 5 =
Column Totals:	75 (A)	295 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ______ **No** X

Remarks:
Highly disturbed and overgrazed dry pastureland with little to no vegetation; mostly bare soil.

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10R3/4						Loamy Sand	
2-8	10R3/6						Loamy Sand	More gritty
8-12	10R3/4						Sand	Very gritty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: None observed

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12 inches

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ____________

Water Table Present? Yes ______ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is water in the Lauhuku stream bed or Kukaiohiki Gulch immediately to the southwest. But the source of water is unnatural . An overflowing water tank above (east) on the ranch is the source of water in this otherwise usually dry stream bed.

WETLAND DETERMINATION DATA FORM – Hawaiʻi and Pacific Islands

Project/Site: Kam Hwy Realignment Vicinity of Laniakea City: Haleiwa Sampling Date: 11.11.2021 Time: 11:30 am

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP-2

Investigator(s): Shahin Ansari and Linda Koch TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: ______ Long: ______ Datum: ______ Slope (%): ______

Soil Map Unit Name: Waialua Silty Clay , 0 to 3 percent slope NWI classification: E2EM1N (Estuarine and Marine Wetland)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No X (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X
Hydric Soil Present?	Yes ______	No X
Wetland Hydrology Present?	Yes ______	No X

Is the Sampled Area within a Wetland? **Yes** ______ **No** X

Remarks:
Last month (October 2021) this area received 53% less than the average monthly rainfall. The usually dry stream bed of Kukaiohiki Gulch immediately south of the site was unnaturally full of water. A leak in a large water tank inland on the ranch was the source of the observed water.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10 ft x 10 ft)			
1. *Prosopis pallida*	25	X	FACU
2.			
3.			
4.			
5.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft x 5 ft)			
1. *Xanthium strumarium*	5	X	FACU
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Cynodon dactylon*	10	X	FACU
2. *Verbesina encelioides*	1		FACU
3.			
4.			
5.			
6.			
7.			
8.			
	11	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 15
FACU species	41	x 4 = 164
UPL species		x 5 =
Column Totals:	41 (A)	164 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ______ **No** X

Remarks:
Highly disturbed and overgrazed dry pastureland with little to no vegetation; mostly bare soil.

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR3/3						Sandy Clay	
4-10	2.5YR3/6						SandyClay	clay balls within matrix
8-12	2.5YR3/4						Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: None observed

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:
Few plant roots to 12 inches.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______
Water Table Present? Yes ______ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ______

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is water in the Lauhulu stream bed or Kukaiohiki Gulch immediately (about 30 feet) to the southwest. But the source of water is unnatural . An overflowing water tank above (east) on the ranch is the source of water in this otherwise usually dry stream bed.

WETLAND DETERMINATION DATA FORM – Hawai‘i and Pacific Islands

Project/Site: Kam Hwy Realignment Vicinity of Laniakea City: Haleiwa Sampling Date: 11.11.2021 Time: 1:30 pm

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP-3

Investigator(s): Shahin Ansari and Linda Koch TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: ______ Long: ______ Datum: ______ Slope (%): ______

Soil Map Unit Name: Waialua Silty Clay , 0 to 3 percent slope NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No X (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X	Is the Sampled Area within a Wetland? Yes ______ No X
Hydric Soil Present?	Yes ______	No X	
Wetland Hydrology Present?	Yes ______	No X	

Remarks:
Last month (October 2021) this area received 53% less than the average monthly rainfall. The usually dry stream bed of Kukaiohiki Gulch immediately south of the site was unnaturally full of water. A leak in a large water tank inland on the ranch was the source of the observed water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Cynodon dactylon*	5	X	FACU
2. *Cenchrus clandestinus*	5		FACU
3. *Stachytarpheta jamaicensis*	1		FACU
4. *Chenopodium murale*	1		FACU
5.			
6.			
7.			
8.			
	12 = Total Cover		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
	______ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 15
FACU species	12	x 4 = 48
UPL species		x 5 =
Column Totals:	12 (A)	48 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks:
Highly disturbed and overgrazed dry pastureland with little to no vegetation; mostly bare soil.

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5YR3/3						Silty Clay Loam	
2-12	2.5YR3/3						Silty Clay Loam	gravel in matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: None observed

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No X

Remarks:

Rocks at bottom.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ____________

Water Table Present? Yes ______ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is water in the stream bed of Kukaiohiki Gulch to the southwest. But the source of water is unnatural . A n overflowing water tank above (east) on the ranch is the source of water in this otherwise usually dry stream bed.

WETLAND DETERMINATION DATA FORM – Hawai‘i and Pacific Islands

Project/Site: Kam Hwy Realignment Vicinity of Laniakea City: Haleiwa Sampling Date: 11.11.2021 Time: 2:15 pm

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP-4

Investigator(s): Shahin Ansari and Linda Koch TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: ______ Long: ______ Datum: ______ Slope (%): ______

Soil Map Unit Name: Waialua Silty Clay , 0 to 3 percent slope NWI classification: E1UBL (Estuarine and Marine Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No X (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? **Yes** ______ **No** X

Remarks:
Last month (October 2021) this area received 53% less than the average monthly rainfall. The usually dry stream bed of Kukaiohiki Gulch immediately south of the site was unnaturally full of water. A leak in a large water tank inland on the ranch was the source of the observed water.

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10 ft x 10 ft)			
1. *Prosopis pallida*	25	X	FACU
2.			
3.			
4.			
5.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft x 5 ft)			
1. *Acacia farnesiana*	5	X	UPL
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Cynodon dactylon*	5	X	FACU
2. *Cenchrus clandestinus*	5		FACU
3.			
4.			
5.			
6.			
7.			
8.			
	10	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	5	x 3 = 0
FACU species	35	x 4 = 140
UPL species	5	x 5 = 25
Column Totals:	40 (A)	165 (B)

Prevalence Index = B/A = 4.125

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ______ **No** X

Remarks:
In the swale parallel to the Kamehameha Highway and in Milo-kiawe thicket - under kiawe tree canopy.

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR2.5/3						Clay Loam	
4-14	2.5YR2.5/3						Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: None observed

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

Some roots in top 4 inches

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______
Water Table Present? Yes ______ No X Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ______

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is water in the Lauhulu stream bed or Kukaiohiki Gulch to the south. But the source of water is unnatural . An overflowing water tank above (east) on the ranch is the source of water in this otherwise usually dry stream bed.

WETLAND DETERMINATION DATA FORM – Hawai‘i and Pacific Islands

Project/Site: Kam Hwy Realignment Vicinity of Laniakea City: Haleiwa Sampling Date: 11.11.2021 Time: 3:00 pm

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP-5

Investigator(s): Shahin Ansari and Linda Koch TMK/Parcel: ____

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: ____ Long: ____ Datum: ____ Slope (%): ____

Soil Map Unit Name: Waialua Silty Clay , 0 to 3 percent slope NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
Last month (October 2021) this area received 53% less than the average monthly rainfall. The usually dry stream bed of Kukaiohiki Gulch immediately south of the site was unnaturally full of water. A leak in a large water tank inland on the ranch was the source of the observed water.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10 ft x 10 ft)			
1. *Thespesia populnea*	30	X	FAC
2.			
3.			
4.			
5.			
= Total Cover	30		
Sapling/Shrub Stratum (Plot size: 5 ft x 5 ft)			
1. *Xanthium strumarium*	5	X	FACU
2.			
3.			
4.			
5.			
= Total Cover	5		
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Cynodon dactylon*	3	X	FACU
2. *Cenchrus clandestinus*	3		FACU
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover	6		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	30	x 3 = 90
FACU species	11	x 4 = 44
UPL species		x 5 =
Column Totals:	41 (A)	134 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
In the swale parallel to the Kamehameha Highway and in Milo-kiawe thicket - under milo tree canopy.

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR2.5/3						Loam	
4-8	2.5YR2.5/3						Sandy Loam	
8-17	2.5YR4/8						Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: None observed

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ____________

Water Table Present? Yes ______ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ____________

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

There is water in the Lauhulu stream bed or Kukaiohiki Gulch to the southwest. But the source of water is unnatural . An overflowing water tank above (east) on the ranch is the source of water in this otherwise usually dry stream bed.

Appendix D. Photos of the Study Area

Photo 1. Sample Point SP-1
Notes: Point (circled) taken to investigate an area in the pasture next to the inundated stream bed of Kukaihiko gulch that overlaps the NWI feature—Estuary and Marine Deepwater. The sample point is about 25 inches from the water's edge. Location was determined not to be a three parameter wetland. Note, the inundated stream bed is outside of the study area. Photo direction = southwest.

Photo 2. Sample Point SP-2
Notes: Point taken to investigate an area in the pasture above SP-1 and overlaps the NWI feature—Estuary and Marine Wetland. The sample point is about 30 feet from the water's edge and SP1. Location was determined not to be a three parameter wetland. The pool of water observed is outside of the study area. Photo direction = southwest.

Photo 3. Sample Point SP-3
Notes: Point taken to investigate a relatively low lying area in the pasture that is not identified as a NWI feature. Photo direction = northeast.

Photo 4. Sample Point SP-4
Notes: Located in the under canopy of kiawe (*Prosopis pallida*) trees. Photo direction = northeast. The area was determined not to be a wetland.

Photo 5. Sample Point SP-5
Notes: Located under canopy of milo (*Prosopis pallida*) trees. Photo direction = northwest. The area was determined not to be a wetland.

Photo 6. Water Pooling in the Kaukaiohiki Stream Bed along the Southwestern Border of the Study Area

Photo 7. Overflowing Water Tank Upland about 1000 Feet above the Study Area that Contributed to Water Ponding at the Mouth of the Laniakea Stream Bed next to the Study Area

Photo 8. Dry Laniakea Stream Bed above the Overflowing Water Tank

Photo 9. On the Ranch Owner's Property, Surface Water Flow from the Overflowing Water Tank (Not Seen Here) Flowing Downslope toward the Laniakea Stream Bed

Photo 10. Left Photo—Surface Water Flow (Indicated by the Red Arrow in Left Picture) on the Ranch from the Over Flowing Water Tank (Not Seen Here) Flowing toward the Laniakea Stream Bed; Right Photo—the Surface Water Seen in the Laniakea Stream Bed about 1000 Feet above the Study Area.