



Pearl Harbor Multimodal Connection Study

O'ahu, Hawaii

Prepared for the Federal Highway Administration, Central Federal Lands Highway
Division and the City and County of Honolulu

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1. Introduction

1.1 Project Overview

The Federal Highway Administration Central Federal Lands Highway Division (herein after referred to as FHWA CFLHD), in cooperation with the City and County of Honolulu (City), and support of the U.S. Navy (Navy) and the National Park Service (NPS), initiated this HI FLAP Pearl Harbor Bicycle and Pedestrian Access Alternatives Project to assess the feasibility of bicycle and pedestrian access to the NPS WWII Valor in the Pacific National Monument (VALR) and U.S. Navy Joint Base Pearl Harbor Hickam Facilities. The primary focus of this study was to extend the existing PHHT to VALR (a portion of which is along Arizona Memorial Drive (AMD)) and a connection along Richardson Road to the Honolulu Authority for Rapid Transportation (HART) station at Aloha Stadium. This project is consistent with the City and County of Honolulu O'ahu Bike Plan and the Pearl Harbor Historic Trail Master Plan, and complements development of the Aloha Stadium HART station and other area planning efforts.

This document describes the project context, the purpose and need for enhanced pedestrian and bicycle access, concepts evaluated, and analysis of environmental resources of concern in the study area. The study includes a detailed screening process of trail alignments that could link the existing PHHT near the Bombproof Switch Station to AMD (which then connects to VALR). A preferred concept is recommended from the screening process; this concept was developed through both stakeholder and public input. The next steps are to advance funding for further design and construction in partnership between CFLHD and the City and County of Honolulu.

1.2 Project Funding

Funding for this scoping phase report was secured through the FHWA CFLHD Federal Lands Access Program (FLAP). FLAP is a funding program through the Fixing America's Surface Transportation Act (FAST Act), a federal transportation bill passed in 2015. The program provides funding for work on public facilities that are located on, are adjacent to, or provide access to federal lands. The FLAP program requires a local match. The match for this first phase of the project was provided by the City and County of Honolulu.

1.3 Project Context

This bicycle and pedestrian facility would make a connection from the existing terminus of the Pearl Harbor Historic Trail (PHHT), near 'Aiea Bay State Recreation Area, to the VALR Visitor Center. The project area is adjacent and between the areas of AMD and Place and Kamehameha Highway and Salt Lake Boulevard; from the northeast where 'Aiea Access Road and 'Aiea Bay State Recreation Area intersect Kamehameha Highway southwest to where Halawa Stream runs under Kamehameha Highway. The Rainbow Bay recreational area is a

major recreational amenity area for Joint Base Pearl Harbor Hickam (JBPPH) and includes a small boat harbor, a boat storage yard, recreational fields, a restaurant, and the Admiral's Boat House. These facilities are currently not connected to the PHHT. The PHHT, along with the study area for this project, is shown in Figure 1. Figure 2 shows a more detailed view of the project area.

An easement was conveyed by the Navy in October 1995 to the City and County of Honolulu for a 20-year period for the construction, use, maintenance, operation, repair and replacement of the existing PHHT. This easement expired in October 2014. In July 2017, the grant of easement between the U.S. Navy and the City and County of Honolulu was renewed to allow the City's Department of Transportation Services (DTS) to again manage the Pearl Harbor Bike Path.

1.4 Purpose and Need

The purpose of the project is to improve pedestrian and bicycle connectivity by extending the existing PHHT to VALR and providing access from the future HART station being constructed at Aloha Stadium to federal lands (specifically VALR). VALR is the most visited (tourist and resident) destination on O'ahu with over 1,800,000 patrons.

The need for this project stems from the high level of pedestrian and bicycle activity along the existing PHHT and the desire to provide a continuous connection to VALR, as well as a connection from the PHHT to the future HART rail station, which is under construction. The Hawaii Bicycling League conducts an annual count of bicyclists at 10 locations across O'ahu. Counts taken over three days (September 13-15, 2016) counted 204 bicyclists on the PHHT at Neal S. Blaisdell Park (located approximately 1.5 miles from the project area)¹. Direct connectivity has been limited since the PHHT was fenced off for security reasons shortly after September 11th, 2001. Prior to that time, the trail segment connected through the Navy Admiral's Boathouse parking lot from the existing PHHT to



The existing PHHT ends at a fence near the Bombproof Switch Station on one end and the Admiral's Boathouse on the other.

¹ Hawaii Bicycling League https://www.hbl.org/wp-content/uploads/2014/10/2016BikeCount_Results_online.pdf

VALR (a distance of approximately 420 feet). Since that time, the closure has required bicyclists and pedestrians to circle around along Kamehameha Highway.

The current closure forces pedestrians and bicyclists to use a narrow sidewalk along the Kamehameha Highway, which is a high-speed highway with multiple intersections/intersecting roadways. This increases the potential for conflicts between vehicles, pedestrians and bicyclists. The sidewalk alignment crosses an on-ramp from the 'Aiea Connector Road to Kamehameha Highway, which poses safety issues for pedestrians and bicyclists.

Annual visitation to VALR has increased substantially over time, (see Table 1) which places pressure on existing roadway and parking facilities associated with VALR. Provision of a bicycle and pedestrian path would provide improved multi-modal access to VALR and surrounding amenities, and would enhance connections to wider recreational facilities and historic points of interest along the waterfront. The 'Aiea community along with many of the other Leeward communities and the bicycling and recreational stakeholders have asked the City and County of Honolulu and the State of Hawaii to make the Pearl Harbor Historic Trail a major continuous alignment from the Airport to the Waianae Coast.

Table 1: Annual Visitors to VALR

Year	Visitors
2010	1,372,724
2011	1,694,896
2012	1,751,224
2013	1,786,024
2014	1,620,814
2015	1,574,156
2016	1,819,020

Source: NPS SSRS Report

The following list summarizes the specific needs for this project. These needs were defined within the Federal Lands Access Program (FLAP) application as well as through initial stakeholder meetings.

1. Improve pedestrian and bicycle mobility
2. Improve safety for trail users
3. Minimize environmental impacts

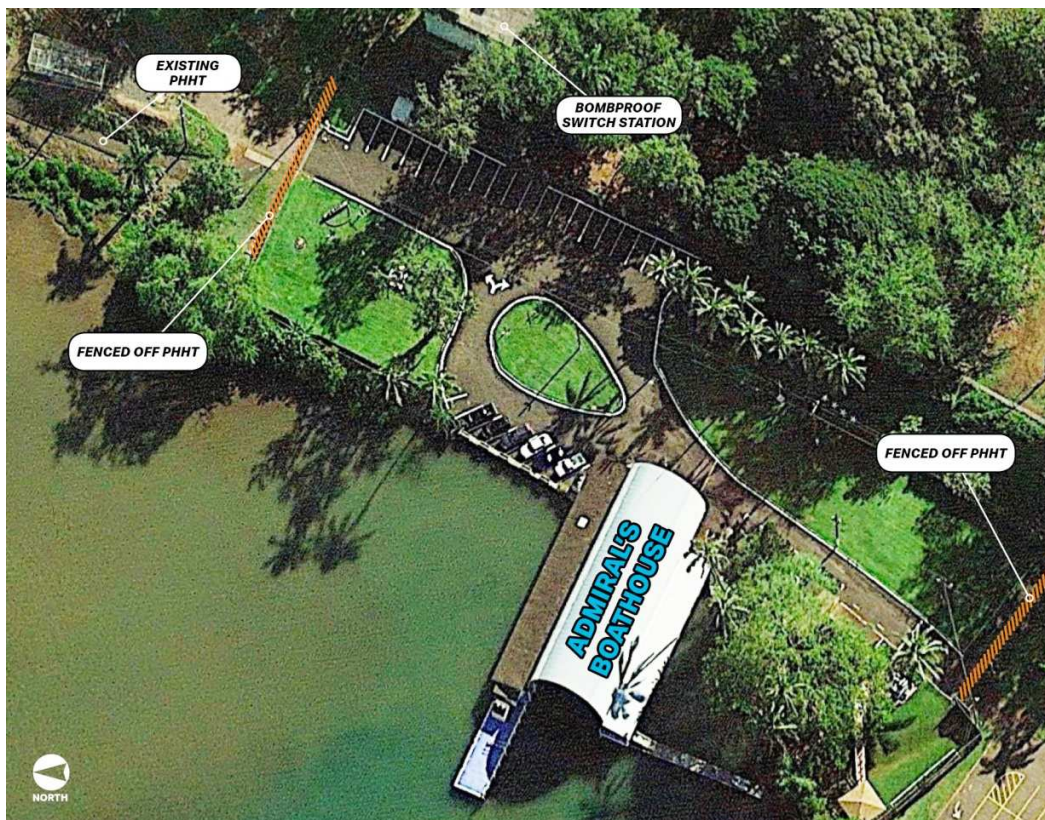


Figure 1 – Historic PHHT Alignment

Figure 2 – Vicinity Map

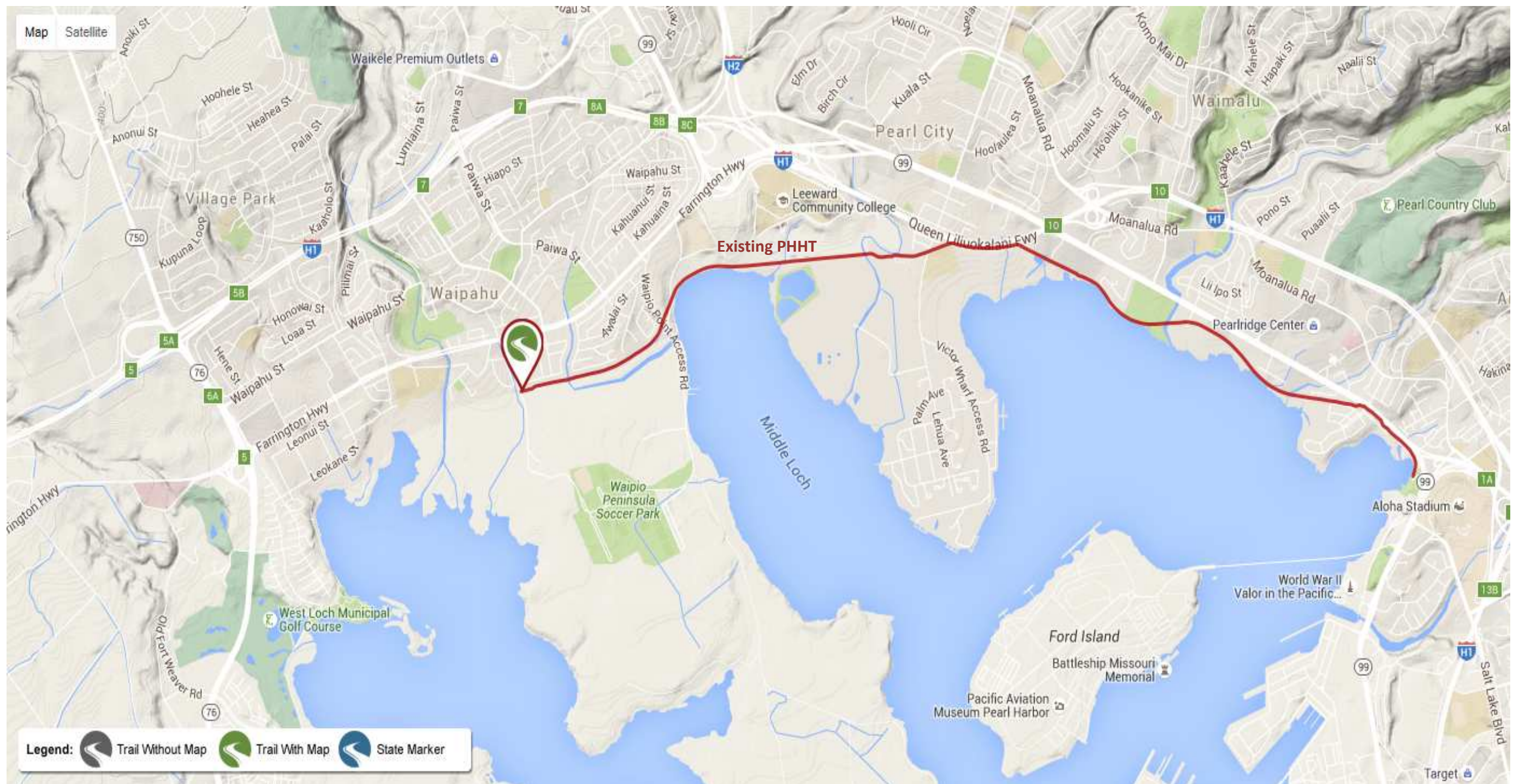


Figure 3 – Site Map

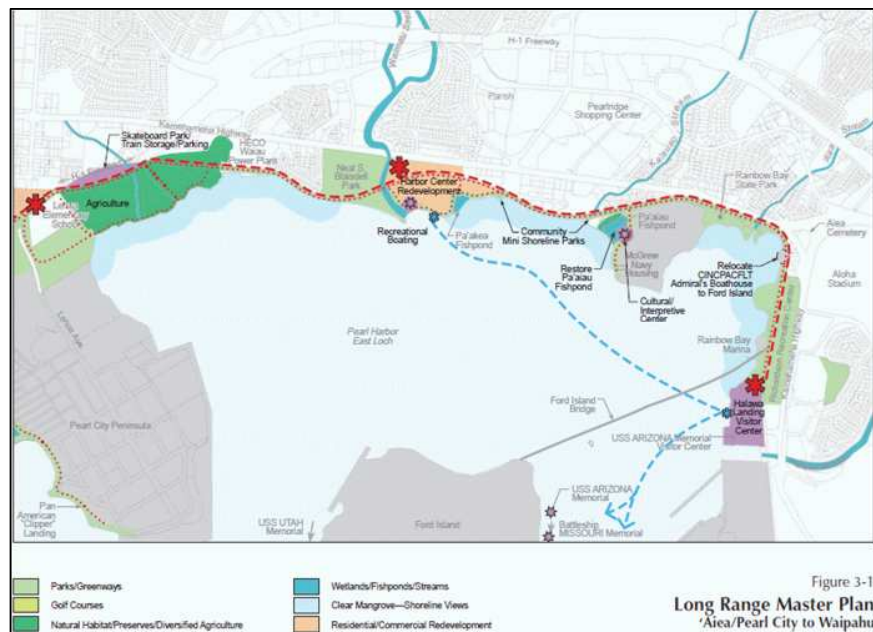


2. Previous Studies

Support for a PHHT trail extension has been documented in numerous past studies. It is included as a recommendation in the World War II Valor in the Pacific National Monument Phase 2 Transportation Plan done for the NPS by CFLHD. It is described in detail in the PHHT Master Plan, the O'ahu Bike Plan, Honolulu High-Capacity Transit Corridor Project Environmental Impact Statement, and the Halawa Area Transit-Oriented Development (TOD) Plan, as described below.

2.1 PHHT Master Plan (2003)

The PHHT Master plan, published in May 2001 and adopted by City Council in 2003, evolved from the 'Aiea-Pearl City Community Vision Group's Year 2000 project which focused on an 18.6-mile long rail and trail system that would link neighborhoods to beach parks and other recreation areas, regional attractions, historic sites and nature habitats between 'Aiea and Nanakuli. The Master Plan served as the basis for the revitalization of the shoreline that currently features a city-run bike path from Pearl Harbor to Waipahu and Ewa Beach, with the hope of extending it into Nanakuli. This project represents an effort to develop a continuous path connecting the trail directly to VALR and to the Aloha Stadium station (Source: *Historic Hawaii Foundation*).



Proposed redevelopment of Aiea's coastline under the PHHT Master Plan

2.2 O'ahu Bike Plan (2012)

The O'ahu Bike Plan, published in August 2012 by the City, provides goals and recommendations to enhance bicycling for the entire island. The Pearl Harbor Bike Path linking Kamehameha Highway to AMD is shown as a high priority project in the O'ahu Bike Plan.

2.3 Honolulu High Capacity Transit Corridor Project - Environmental Impact Statement (EIS) and Record of Decision (ROD) (2011)

The City, in partnership with the Federal Transit Administration, is building the HART project that will bring rail transit service to the island of O'ahu. Within the vicinity of this trail alternatives project, the preferred guideway alignment will follow Farrington Highway east on an elevated structure and continue along Kamehameha Highway to the vicinity of Aloha Stadium. The alternative includes a stop at the Aloha Stadium with a shared use park and ride lot and bus transit center along Kamehameha Highway.

Table 2 shows projected Year 2030 trips to the Aloha Stadium by mode of access.

Table 3 show bus routes and daily stop activity at bus stops in the site vicinity. A system map of bus routes may be accessed at <http://thebus.org/SystemMap/TheBusSystemMap.pdf>



The Halawa Area Plan shows a recommended pedestrian connection along Richardson Road and then extending to VALR.

(Source: Figure 3-13 of the Halawa Area Draft TOD Plan Report)

Table 2: Year 2030 Trips to the Aloha Stadium Station By Mode of Access

Mode	Walk	Bus Transfer	Kiss and Ride	Formal Park and Ride	Informal Park and Ride	Total
# Trips	2,166	1,504	176	1,506	75	5,427

Source: HART and OahuMPO TransCAD 6.1 (11/15/16) - rev

Table 3: Total Daily Stop Activity in the Site Vicinity

Stop Name	Stop ID	Daily Stop Activity
KAMEHAMEHA HWY KALALOA ST	477	366
KAMEHAMEHA HWY KOHOMUA ST	478	114
KAMEHAMEHA HWY SALT LAKE BL	479	250
KAMEHAMEHA HWY OPP SALT LAKE	695	551
KAMEHAMEHA HWY FORD ISLAND B	696	76
KAMEHAMEHA HWY ARIZONA MEMOR	697	694
SALT LAKE BL KAMEHAMEHA HWY	2572	46
ARIZONA MEMORIAL	4322	293

Source: OTS 2015 Total Daily Stop Activity

2.4 Halawa Area TOD Plan (2016)

The Halawa Area TOD plan (2016) evolved from the Honolulu High Capacity Transit Corridor Project with a focus on development of a community vision for the neighborhoods surrounding the Aloha Stadium Station. The need for additional pedestrian connections is included as a common theme in the plan; specifically, providing an alternate pedestrian connection from Aloha Stadium Station to the Pearl Harbor Visitor Center. This recommended trail would connect through Richardson Field in order to connect to the PHHT and to the Pearl Harbor Visitor Center. The plan also recommends transformation of Kamehameha Highway into a complete street with improved pedestrian and bicycle facilities.

3. Agency Coordination and Public Involvement

A series of agency coordination and public outreach activities occurred over the course of this project. Since agency meetings were often held within the same week as public meetings, the descriptions are combined below by project phase.

As part of this project, a Core Team was developed of agencies involved in the effort. The Core Team included representatives of:

- FHWA-CFLHD
- City and County of Honolulu Department of Transportation Services (DTS)

- NPS WWII Valor in the Pacific National Monument
- U.S. Navy Joint Base Pearl Harbor Hickam
- State of Hawaii Department of Transportation

The Core Team met at key milestones over the course of the project to discuss project progress to provide input on concepts and determine action items.

3.1 Project Initiation and Concept Analysis

A project Core Team Coordination Meeting was held on November 9th, 2016. Attendees included representatives of CFLHD, the City and County of Honolulu, the Navy and the consultant team. The purpose was to introduce the FLAP application process, discuss project concepts under consideration, provide an overview of the environmental analysis and confirm the schedule. All attendees indicated that the concept for a proposed connector was desirable.

A public meeting was held the evening of November 9th, 2016. The meeting was an open house format with boards placed around the room. Approximately 15 persons attended the meeting. Stakeholders attended from the 'Aiea Neighborhood Board, 'Aiea Community Association, the Hawaiian Civic Club, and Hawaii Bicycling League, and representatives of City Council members. The purpose of the public meeting was to introduce the project, discuss project concepts and provide an overview of the environmental analysis. Specifically, discussion of:

- Purpose and Need
- Concepts Identified
- Concept Comparison
- Environmental Constraints

Concepts 1, 2 and the Improved No Action were presented on boards (see Section 3 of this report for detail on concepts). The public's opinion at this meeting was to open the gates and allow bicyclists and pedestrians to pass through the Admiral's Boathouse parking lot. The study team advised those at the meeting that opening the gates to the existing Admiral's Boathouse parking and providing unrestricted access would have a low probability of approval by the Navy. It was suggested that the study team look for options that pass between the Admiral's Boathouse parking and the Bombproof Switch Station. This option became referred to as Concept 3 in subsequent analysis. There was support for this option since it is the most direct route (follows the historic trail alignment prior to 2001 closure) and avoids safety concerns posed by crossing behind the Bombproof Switch Station. In particular, meeting participants expressed concern about visibility if the trail were to extend behind the bombproof switch station, since homeless encampments have become an increasing concern along other portions of the PHHT.

On November 10th 2016 (the day after the November 9th public meeting), a site walk was facilitated with stakeholders including the Navy, City/County, CFLHD, and Bicycle Coalition. The stakeholders walked each alignment including the one (Concept 3) that would extend in front of the Admiral's Boathouse (as voiced by public meeting attendees the evening prior). The group's consensus at this site walk was that an option that would extend the PHHT along the historic alignment adjacent to the Admiral's Boathouse parking lot was feasible and preferable from a vertical grade and direct connection standpoint. Thus, the team continued advancing this option.

3.2 Concept Refinement

Based on consensus from the Fall 2016 meetings, the team advanced the option that extends the PHHT adjacent to the Admiral's boathouse parking lot to intersect with AMD and Richardson Road. This became referred to as Concept 3.

A follow up meeting was held with Naval Facility Engineering Command (NAVFAC-Hawaii) on March 27, 2017 to discuss the refined concepts. The design, environmental, and public comments for the concepts were discussed. Members of the consultant team attended on behalf of CFLHD and City and County of Honolulu. Immediately following the NAVFAC-Hawaii meeting, representatives of NAVFAC-Hawaii and the consultant team visited the site, and discussed the feasibility and desirability of the design concepts. It was the consensus was again that the concept with the connector alignment adjacent to the Admiral's Boathouse parking lot was feasible.

A Core team meeting conference call was held on April 28th, 2017 to discuss the progress on concepts development, the recommended Concept 3, and the connecting segments for AMD to VALR and along Richardson Road to the future HART station. The technical, environmental and cost considerations were detailed for each of these options. Next steps with agency and stakeholder coordination were confirmed, including the planning for core team and public meetings scheduled for June 2017.

A subsequent core team meeting was held on June 13th, 2017 to discuss the recommended concept in further detail. Participants at the core team meeting agreed with the presentation of the concepts along with the indicating Concept 3 as the recommended alternative.

A public meeting was held on June 13th, 2017, with the same materials presented at the core team on June 13th. Specifically, the meeting focused on:

- Concepts Identified
- Recommended Concept 3 concept design, with Richardson Road and AMD segments
- Environmental Constraints

- Next Steps

The consensus from the well-attended public meeting was an endorsement of the recommended concept. There were still some that advocated for an option that just opened the Admiral's Boathouse parking lot gates, but it appeared that the majority favored the recommended Concept 3. There were no vocal proponents of the No Build or Concepts 1 or 2.

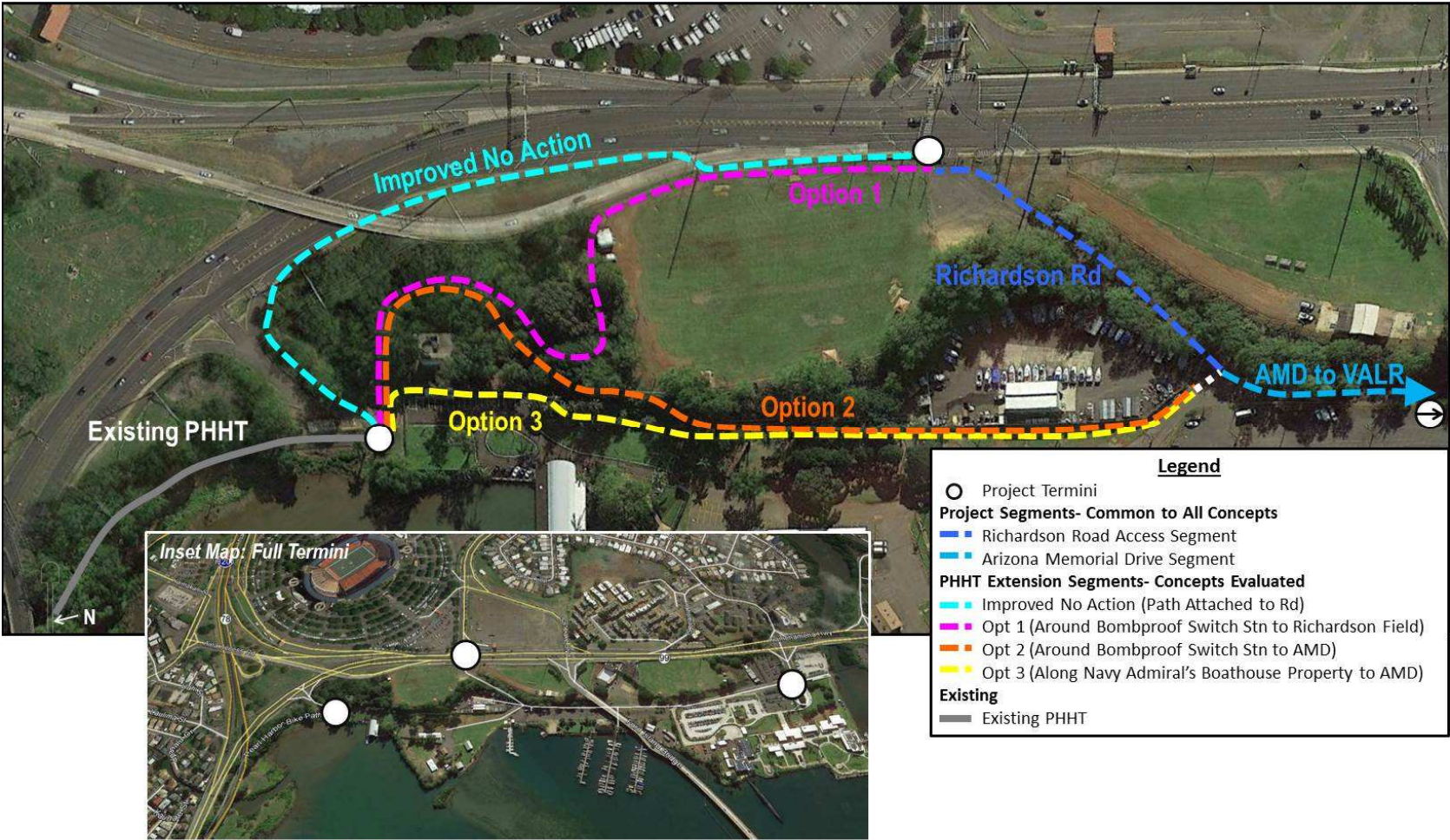
An agency coordination meeting was held on June 14th, 2017 with the FHWA CFLHD, City and County of Honolulu DTS, City and County of Honolulu Department of Planning and Permitting (DPP), Navy Region Hawaii, the Naval Facilities Engineering Command (NAVFAC-Hawaii) to the concepts, the input from the public meeting, and steps forward. The Navy Region Hawaii representative indicated that the concepts would need to be reviewed by the Commander Naval Region Hawaii.

3.3 Concept Development and Evaluation

The extent of the project is from the existing PHHT to VALR and to the Aloha Stadium. The project includes construction of two trail connection segments: (1) Richardson Access Road Segment which will extend along Richardson road to connect the future HART Station to AMD and; (2) AMD Segment inclusive of an attached sidewalk or separated path to better accommodate pedestrians and bicyclists. The concept development process focused on an evaluation of design concepts for a new section of the PHHT trail that would extend from the existing fence just west of the Bombproof Switch Station to the intersection with AMD. Since there are multiple alignment possibilities, a number of concepts were evaluated (See Figure 4):

- Improved No Action (along Kamemehaha Highway)
- Concept 1- Around Bombproof Switch Station to Richardson Field
- Concept 2- Around Bombproof Switch Station to AMD
- Concept 3- Along Navy Admiral's Boathouse Property to AMD (Historic Alignment)

Figure 4 – Concepts Considered



4. Concept Presentation

4.1 Richardson Access Road Segment

These improvements would connect trail users from the future HART station to AMD and VALR along Richardson Road. This segment would include construction of an attached paved sidewalk on the uphill side of the roadway. It would require continuation of 7% slopes (as exists today). This segment from the intersection with Salt Lake Boulevard at the Kamehameha Highway to the intersection with AMD is 580 feet in length. Total cost for this section is approximately \$863,000 (see Appendix C for a detailed cost estimate).



View of Existing Richardson Road

4.2 Arizona Memorial Drive (AMD) Segment

This concept would improve AMD to better accommodate pedestrians and bicyclists. From the intersection with Richardson Access Road to the VALR entrance, a concrete attached sidewalk would be added on the uphill side of AMD. This section is approximately 1,000 feet in length on flat land. From the VALR entrance up to Kamehameha Highway, it is anticipated that bike lanes would be implemented on AMD and AMP. The improvements on AMD between Richardson Road and VALR would require installation of fence at an existing electrical pad shown in the photo below and requires avoidance of existing overhead poles. Makalapa Park is located between Kamehameha Highway and AMD, but would not be encroached upon with this concept. The cost is approximately \$1,500,000 for this section (see Appendix C for a detailed cost estimate).



View of Existing Arizona Memorial Drive

For the segment between the existing PHHT and VALR presented from here forward as the '*Bombproof Switch Station to AMD*', the goal is to provide a range of feasible alternatives and screen those through a series of criteria.

4.3 Bombproof Switch Station to AMD Segment- Concept Summaries

Four different design concepts were considered to connect from the existing PHHT near the current termini at the US Navy Boathouse gate to AMD. An evaluation matrix which compares these concepts is included in Table 4.

4.3.1 Improved No Action:

This concept would extend from the existing PHHT termini (near the US Navy Boathouse Ewa Gate) to the Kamehameha Highway. This would include a new section of 8-foot multi-use path along the access road from the US Navy Boathouse to Kamehameha Highway (300 feet). It would parallel the highway and require crossing of an existing high speed highway on-ramp. The existing attached sidewalk would be reconstructed with a new 8-foot wide attached multi-use path parallel to Kamehameha Highway. New ADA ramps would be constructed across the high speed on-ramp (1,050 feet). The path would extend to the crosswalk at the intersection of Kamehameha Highway with Salt Lake Boulevard, where the concept would connect to the Richardson Road SPUR to continue to VALR. The total length required is approximately 1,350 feet of concrete multi-use path (both attached and detached depending on the section).

4.3.2 Concept 1- Around Bombproof Switch Station to Richardson Field:

This Concept would extend from the existing PHHT terminus, cross between the Bombproof Switch Station and Kamehameha Highway through undisturbed vegetation (trees) and then wind up toward Richardson Field behind the restrooms/maintenance shed and Kamehameha Highway. This section requires a grade change of over ~35 feet in a short distance requiring a curvilinear alignment with switchback curves to keep the path at a 5% grade (720 feet). The path would then continue between Kamehameha Highway and Richardson Field as it heads Koko Head to the intersection with Salt Lake Boulevard. It would connect to the Richardson Road SPUR to continue to VALR. This section of path would be on the Makai side of the existing fence along Kamehameha Highway on the existing grass fields (~500 feet). It would be aligned to minimize impacts to existing utility poles in this area. The total length required is approximately 1,200 feet of path (both attached and detached depending on the section).

4.3.3 Concept 2- Around Bombproof Switch Station to AMD:

Similar to Concept 1, this Concept would extend behind the Bombproof Switch Station, but instead of heading up to Richardson Field, it would then extend through mature trees back around towards the Navy Boathouse, joining the old PHHT path Koko Head side of the Boathouse property. This section is approximately 600 feet and would require a 20-30 foot tall cut retaining wall to fit between the upper Richardson Field and Boathouse property. Continuing Koko Head the trail segment would involve rehabilitation of the old PHHT path

between the Boathouse parcel and AMD/Richardson Road intersection near the Boat Storage Lot (~900 feet). This Concept is approximately 1,500 feet in length.

4.3.4 Concept 3- Along Navy Admiral's Boathouse Property to AMD (Historic Alignment):

This alignment, born from public and stakeholder input, would extend along the fence between the Bombproof Switch Station on the Boathouse. The path would border the edge of the parking lot of the Boathouse before connecting to the old PHHT path on the Koko Head side of the Boathouse (~400 feet). The path would be physically separated from the Admiral's Boathouse parking by fencing on both sides, and would require reconfiguring parking spaces and relocating the Admiral's four stars landscape feature. No parking spaces would be displaced, just a shift in location. The path would continue Koko Head along the old PHHT trail and would involve rehabilitation of the old path surface between the Boathouse parcel and AMD/Richardson Road intersection near the Boat Storage Lot (~900 feet). The concept is approximately 1,300 feet.

4.4 Bombproof Switch Station to AMD - Evaluation Process

Multiple concepts (alignment configurations) for the section of trail between the Bombproof Switch Station and AMD were considered in the evaluation process. Public and agency stakeholders provided key input to help guide a range of possible design concepts and the factors that were important in distinguishing between concepts. Evaluation criteria used evolved from this outreach process, as well as technical input based on engineering, analytic judgement and supporting data. The National Environmental Policy Act (NEPA) recommends development of evaluation criteria through the purpose and need. The criteria used to evaluate the concepts for this project reflect the purpose and need statement that was collaboratively drafted by the Core Team and grounded in the Federal Lands Access Program Letter of intent and application material submitted for qualification for funding. Due to the importance of stakeholder and public support, criteria specific to level of support were organized into a separate category. Cost and constructability related factors were also organized into a separate category.

The five primary evaluation criteria included:

1. Fulfill Purpose and Need – Improve Pedestrian and Bicycle Mobility
2. Fulfill Purpose and Need – Improve Safety for Trail Users
3. Fulfill Purpose and Need – Minimize Environmental Impacts
4. Stakeholder and Public Support
5. Cost and Constructability

Criteria within each of these categories were defined and measured. The concepts were evaluated using a process called Choosing by Advantages, where decisions are based on the

importance of advantages between concepts. The evaluation involves the identification of the attributes or characteristics of each concept relative to the evaluation criteria, and a determination of the advantages for each alternative under each criterion. In some cases, the criteria were qualitative in nature based upon the best available data and information. In others, quantitative data were available and applied as a comparison between concepts (cost, for example). An explanation of each criterion within each category is as follows. Table 1 shows each criterion, a description of the attributes and the level of comparative advantage for each concept. The level of advantage for each criterion was color coded with “red” being less advantageous and “green” being more advantageous. The concept with the greatest number of advantages was advanced as the recommended.

4.4.1 Fulfill Purpose and Need – Improve Pedestrian and Bicycle Mobility

a. Does the concept provide a more direct pedestrian and bicycle connection to VALR from the existing PHHT?

One of the primary goals of this project is to create a safe and direction connection to VALR from the existing PHHT near the Bombproof Switch Station. The intent is to improve connectivity to better link users of the PHHT to VALR. This criterion was measured by relative distance, level of difficulty for users of the trail, and level of safety along the alignment.

This criterion was measured by **Less Direct/Somewhat Direct/Most Direct**.

b. Does the concept provide a more direct pedestrian and bicycle connection to the HART station?

A connection from the existing PHHT (near the Bombproof Switch Station) to the HART station would assist in improving connectivity for PHHT users and visitors. This criterion evaluated distance and level of direct connection between the two destinations.

This criterion was measured by **Less Direct/Somewhat Direct/Most Direct**.

c. Does the concept support broader recreational and access goals for the PHHT?

The goals and objectives of the PHHT as stated in the Master Plan included: outdoor recreation/physical fitness network, historic preservation and education, economic revitalization and environmental preservation and education. This criterion measured level of adherence to and support of these goals.

The criterion is measured by **Less Supportive/Supportive**.

4.4.2 Fulfill Purpose and Need – Improve Safety for Trail Users

a. Does the concept increase the potential for conflicts between vehicles and pedestrians/bicyclists?

Public input through this process indicated that Kamehameha Highway is challenging to cross as a pedestrian or bicyclist. Concepts that require crossing of the Highway facility were considered less advantageous.

Measured by **Potential for Conflict/Less Potential for Conflict**.

b. Does the concept create user safety/security concerns?

During the public outreach process, a number of individuals commented on concerns with safety and visibility along the PHHT (homeless encampments have grown in recent years). Other metrics for user safety and comfort include adjacency to the highway and feeling of enclosure along the trail. Since user safety is a perceived factor, the criteria were measured qualitatively based on the anticipated future character and conditions of each design concept.

Measured by **Concern/Minimal Concern**.

c. To what degree do trail profile requirements cause concern?

Trail profile refers to the level of incline along a path. It is recommended that grades on shared use paths be kept to a minimum. Grades greater than 5% are undesirable because the ascents are difficult for many bicyclists to climb and the descents cause some bicyclists to exceed the speeds at which they are competent or comfortable².

Within Table 1, less than 5% grade represents **Less Concern** and greater than 5% grade represents **Concern**.

4.4.3 Fulfill Purpose and Need- Minimize Environmental Impacts

a. Is the concept compatible with previous plans? (Detail included in Appendix A)

The National Environmental Policy Act (NEPA) process identifies land use as a key consideration, which includes evaluation of whether the design concept is supportive of previous planning efforts. Previous plans indicated the need for multi-modal connections to the VALR site and to the future HART station. The variation is in

² American Association of State Highway and Transportation Officials

whether the connection minimizes out of direction travel and maintains a safe pathway for trail users.

This criterion is measured by **Less Compatible/Compatible**.

b. To what extent does the concept impact previously undisturbed land?

Impacts to previously undisturbed lands include impacts to trees/vegetation. This criterion was measured through an aerial evaluation of land area impact by design concept (measured in acreage of impact).

The criterion is measured by **Most Impact/Impact/Least Impact**.

c. Does the concept impact sensitive plant and animal species?

Per Section 5 of this report, at a site visit in November 2016, the following Migratory Bird Treaty Act (MBTA) species were observed: cattle egret (*Bubulcus ibis*) and Pacific golden plover (*Pluvialis fulva*). Other MBTA species may be present such as White tern. Removal of trees has the potential to impact migratory birds. Thus, alternatives with greater tree removal are considered less advantageous.

Criterion measured by **Most Impact/Impact/Least Impact**.

d. Does the concept impact cultural resources?

Per Section 5 of this report, historic facilities in the project vicinity include recreational facilities associated with Richardson Field (club house, bath house/locker room and swimming pool), and facilities at the Admiral's Boathouse area including the Switch Station, CINCPACFLT Boathouse and Finger Pier. They are classified by the Navy as Historic Category III, defined as possessing sufficient historic significance to merit consideration in planning and decision making, but having only minor importance for defining the historic character of the installation. Thus, design concepts that impact or encroach upon these facilities are considered less advantageous.

This criterion was measured by **Impact/Minor Impact**.

d. Does the concept impact hazardous materials?

Per Section 5 of this report, both the bombproof switch station and shed located in front of the switch station have the potential to contain hazardous materials and will require further investigation. Design concepts that impact these facilities, directly or indirectly, are considered less advantageous.

This criterion was measured by **Most Impact/Impact/Least Impact**. Note that further investigation is needed to determine level of impact; thus, a few of the concepts are shown as “Potential Impact” in Appendix A- Table 2.

4.4.4 Stakeholder and Public Support

a. Has the public expressed support for this concept?

The public was engaged through the concept development process to provide input into a preferred trail connection location and factors that were important in distinguishing between alignments. Two primary concerns raised were concepts with proximity to Kamehameha Highway and those that may pose safety and security concerns (behind buildings, for example).

This criterion was measured by **Lower Support/Support**.

b. Is the concept consistent with Navy preferences for site security?

The historic alignment of the trail to VALR was fenced and closed due to safety and security concerns following the events of September 11th, 2001. Navy concerns with constructing a connection pertain to proximity to their existing facilities.

Criterion measured by **Lower Support/Support**.

4.4.5 Cost and Constructability

a. Is right-of-way necessary for the alignment?

This criterion measures the amount to which the project requires encroachment upon other private and agency properties in the vicinity. Existing agency properties include state-owned lands and Navy property. This criterion analyzed new use of right of way parcels for a public trail.

Any use or impact was considered less advantageous.

b. To what extent does the concept impact existing utilities?

Available utility information was collected as part of this project. In addition, utility locations were noted during field visits to the site. Based on available information, level of impact (including need for replacement or relocation) was identified. An assessment of most to least was made for the criteria as indicated by **Most Impact/Impact/Minimal Impact**.

c. *Is construction of the concept financially feasible and reasonable?*

Total project cost includes future planning, design and construction costs per each option. A breakdown of cost estimate by design concept is included in Appendix B. The concepts were measured in dollar sign symbols (\$, \$\$, \$\$\$) by increment of cost as follows (these were not color coded):

- a. \$0-3,000,000 represents \$
- b. \$3,000,000-6,000,000 represents \$\$
- c. Greater than \$6,000,000 represents \$\$\$

d. *What is the complexity, difficulty, and duration of construction?*

Complexity of construction is measured in multiple ways including the amount of road and trail detours and closures, amount of cut and fill material required and difficulty of terrain. The anticipated duration of construction was measured through months. Those that are anticipated to be longer in duration are less advantageous.

This criterion was measured by **Most Complex/Complex/Least Complex**.

4.5 Bombproof Switch Station to AMD - Evaluation Matrix

The following section includes the completed evaluation matrix per the criteria developed in section 4.4. Each concept is evaluated based on the criterion questions and answered with the most current knowledge and data available. The evaluation matrix is presented in order of the five primary evaluation criteria:

1. Fulfill Purpose and Need – Improve Pedestrian and Bicycle Mobility
2. Fulfill Purpose and Need – Improve Safety for Trail Users
3. Fulfill Purpose and Need – Minimize Environmental Impacts
4. Stakeholder and Public Support
5. Cost and Constructability

Following the evaluation of each criterion, an Evaluation Matrix summary is provided that allows for the comparison of each concept against all criteria.

Figure 5 – Concepts Considered

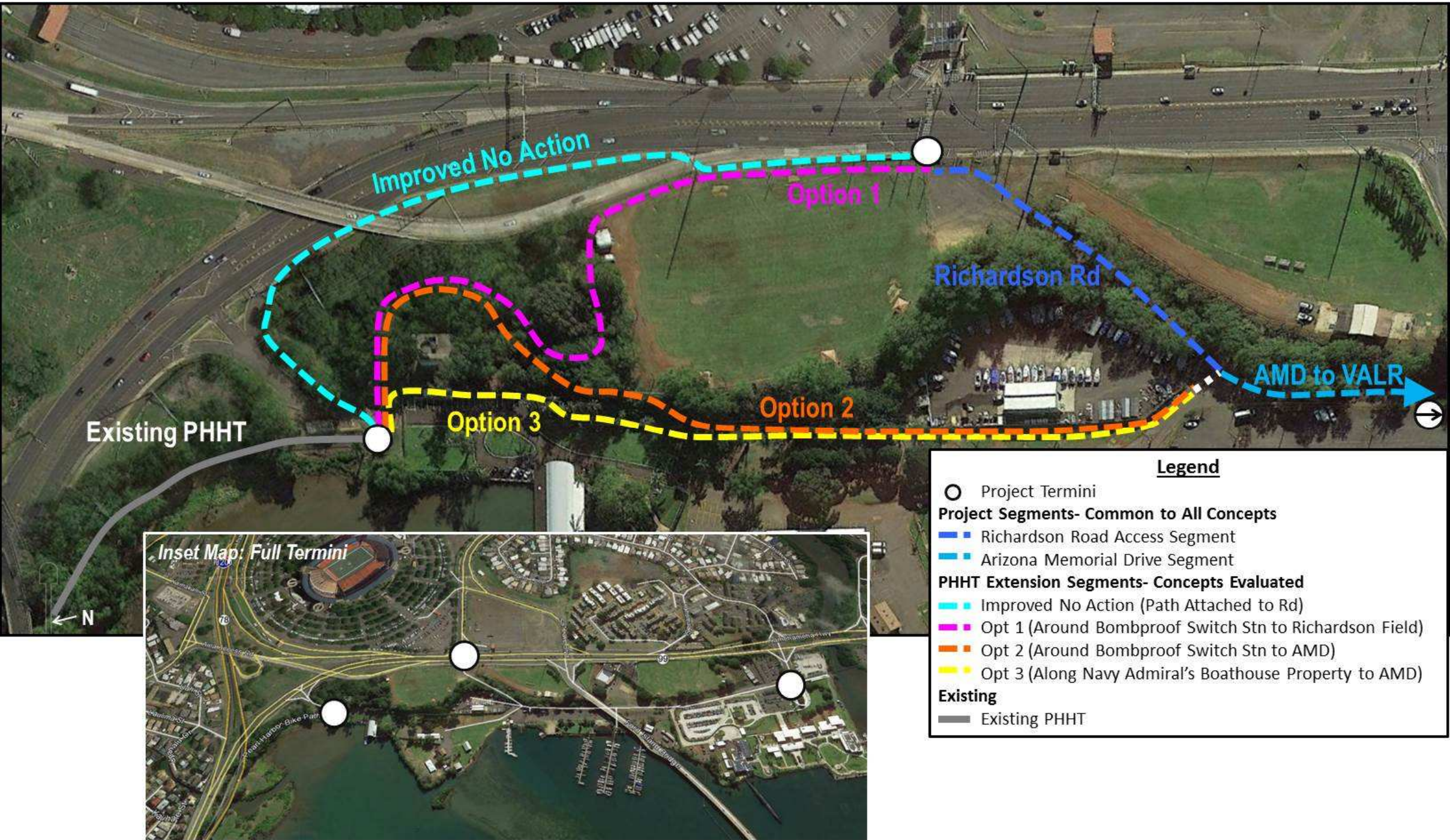


Table 4: Concept Evaluation Matrices

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral’s Boathouse Property to AMD (Historic Alignment)
1. Fulfill Purpose and Need- Improve Pedestrian and Bicycle Mobility				
a. Does the concept provide a more direct pedestrian and bicycle connection to VALR from the existing PHHT?	This pathway, which primarily runs parallel to Kamehameha Highway, would require out-of-direction travel to reach VALR.	This pathway would require out-of-direction travel to reach VALR	This pathway would provide minimal out of direction along the stretch behind the Bombproof Switch Building.	Minimal out of direction travel as the pathway extends along a straight path toward VALR.
EVALUATION	LESS DIRECT	LESS DIRECT	SOMEWHAT DIRECT	MOST DIRECT
b. Does the concept provide a more direct pedestrian and bicycle connection to the HART station?	This path would provide a more direct connection to the HART Station (compared to Options 2 and 3)	This path would provide a more direct connection to the HART Station (compared to Options 2 and 3). It requires crossing through mature trees on a slope.	Less direct; connects to Richardson Road spur, which would then extend to the HART station.	Less direct; connects to Richardson Road spur, which would then extend to the HART station.
EVALUATION	MOST DIRECT	MOST DIRECT	LESS DIRECT	LESS DIRECT
c. Does the concept support broader recreational and access goals for the PHHT?	Supports broader recreational goals due to continuation of PHHT. Challenging environment for pedestrians and bicycles along Kamehameha Highway.	Supports broader recreational goals due to continuation of PHHT. Environmental concerns (impacts to trees) as trail extends around switch station.	Supports broader recreational goals due to continuation of PHHT and direct linkage to VALR. Environmental concerns (impacts to trees) as trail extends around switch station.	Supports broader recreational goals due to continuation of PHHT and direct linkage to VALR (along historic alignment).
EVALUATION	LESS SUPPORTIVE	LESS SUPPORTIVE	LESS SUPPORTIVE	SUPPORTIVE

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral’s Boathouse Property to AMD (Historic Alignment)
2. Fulfill Purpose and Need- Improve Safety for Trail Users				
a. Does the concept increase the potential for conflicts between vehicles and pedestrians/ bicyclists?	Requires crossing of existing high speed highway on-ramp. The pathway would be adjacent to heavy vehicular traffic.	Minimizes vehicular conflicts with the exception of the segment adjacent to Richardson Field (parallel to the highway).	Minimal potential for conflict between vehicles and pedestrians/bicyclists.	Minimal potential for conflict between vehicles and pedestrians/bicyclists.
EVALUATION	POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT
b. Does the concept create user safety/security concerns?	Concerns for rider safety due to proximity to busy highway and necessary crossing of highway ramp.	Visibility limited by existing bridge and buildings (shielded and hidden segment causes safety concerns). The curved and steep alignment poses concerns for users.	Visibility limited by existing bridge and buildings (shielded and hidden segment causes safety concerns). The curved and steep alignment poses concerns for users.	Minimal safety and security concerns for riders. Narrow tunnel feeling due to fencing required on both sides of trail through boathouse grounds. Less significant than grade, visibility or highway adjacency issues.
EVALUATION	CONCERN	CONCERN	CONCERN	MINIMAL CONCERN
c. To what degree do trail profile requirements cause concern?	Minimal impact to stability; less than 4% grade requirement.	Requires steep grades (36 feet of vertical over 500 ft.) Requires 5-7% grades for a 500-foot stretch.	Minimal impact to stability; less than 5% grade requirement.	Relatively flat; less than 2% profile requirement.
EVALUATION	MINIMAL CONCERN	CONCERN	MINIMAL CONCERN	MINIMAL CONCERN

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral's Boathouse Property to AMD (Historic Alignment)
3. Fulfill Purpose and Need- Minimize Environmental Impacts				
a. Is the concept compatible with previous plans?	Previous plans indicated the need for connections to the VALR site and to the future HART station. This concept meets that need, with the exception of forcing an indirect route from the existing PHHT closure (near the Bombproof switch station) to VALR.	Previous plans indicated the need for connections to the VALR site and to the future HART station. This concept meets that need, with the exception of forcing an indirect route from the existing PHHT closure (near the Bombproof switch station) to VALR.	Previous plans indicated the need for connections to the VALR site and to the future HART station. This concept meets that need.	Previous plans indicated the need for connections to the VALR site and to the future HART station. This concept meets that need.
EVALUATION	LESS COMPATIBLE	LESS COMPATIBLE	COMPATIBLE	COMPATIBLE
b. To what extent does the concept impact previously undisturbed land?	Required impact to undisturbed land along the roadway entrance from Kamehameha Highway into the recreation area. Remainder of the alignment is disturbed parallel to the highway.	Impact to 1.13 acres of undisturbed land as the path extends behind the Bombproof structure and connects to Richardson Field.	Impact to 0.8 acres of undisturbed land as the path winds behind the Bombproof structure and then merges with the historic trail alignment.	Impact to 0.2 acres of undisturbed land surrounding the historic trail alignment.
EVALUATION	IMPACT	MOST IMPACT	IMPACT	LEAST IMPACT
c. Does the concept impact sensitive plant and animal species?	Minor impacts to sensitive plant and animal species. Removal and trimming of trees required along entrance roadway.	Potential impact to migratory birds due to the removal of trees around the Bombproof shelter area.	Potential impact to migratory birds due to the removal of trees around the Bombproof shelter area.	Removal of a few palm trees. Likely no impact to migratory birds.
EVALUATION	MINOR IMPACT	MOST IMPACT	MOST IMPACT	LEAST IMPACT
d. Does the concept impact cultural resources?	Requires Richardson Field encroachment (along Kamehameha Highway)	Path crosses adjacent (behind) to, but not on the Bombproof switch station parcel, a PH National Historic Landmark. Requires Richardson Field encroachment and use. Both Section 106 consultation and Section 4(f) determination would be necessary.	Path crosses adjacent to (behind and around), but not on the Bombproof switch station parcel, a PH National Historic Landmark.	Path crosses near but not on the Bombproof switch station parcel and the Admiral's Boathouse area. Both Section 106 consultation and Section 4(f) determination would be necessary for potential impacts to the Admiral's boathouse grounds.
EVALUATION	MINOR IMPACT	IMPACT	IMPACT	IMPACT
e. Does the concept impact hazardous materials?	No impacts to hazardous materials anticipated.	Potential hazardous materials at bombproof switch station	Potential hazardous materials at bombproof switch station	Requires relocation of a storage shed in front of the Bombproof switch station, which may contain hazardous materials.
EVALUATION	NO IMPACT	POTENTIAL IMPACT	POTENTIAL IMPACT	POTENTIAL IMPACT

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral’s Boathouse Property to AMD (Historic Alignment)
4. Stakeholder and Public Support				
a. Has the public expressed support for this concept?	Not supported due to safety considerations for a path running parallel to Kamehameha Highway.	Not supported due to safety considerations parallel to Kamehameha Highway and behind the Bombproof Switch Station; concern with grade changes.	Not supported due to safety considerations for a path running behind the Bombproof Switch Station	Option was raised by the public; support expressed by the public during meetings/outreach.
EVALUATION	LOWER SUPPORT	LOWER SUPPORT	LOWER SUPPORT	SUPPORT
b. Is the concept consistent with Navy preferences for site security?	Consistent with Navy preference to avoid Boathouse property.	More consistent with Navy preference to avoid Boathouse property. Results in view down to boathouse from trail (approximately 300 feet away).	Naval concerns for Boathouse security due to close proximity (within 200 feet) of Admiral's Boathouse.	Naval concerns for Boathouse security due to close proximity (within 200 feet) of Admiral's Boathouse.
EVALUATION	SUPPORT	SUPPORT	LOWER SUPPORT	LOWER SUPPORT

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral’s Boathouse Property to AMD (Historic Alignment)
5. Cost and Constructability				
a. Level of impact and use to existing Right-of-Way	Requires use of State (DOT) and Navy parcels	Requires new use and impacts to State (DLNR) and Navy parcels	Requires new use and impacts to State (DLNR) and Navy parcels (minor impact to Boathouse property)	Requires use of Navy Parcels in alignment with historic PHHT alignment/easements, reconfiguration of Navy Boathouse parking lot and grounds
EVALUATION	USE	NEW USE AND IMPACT	NEW USE AND IMPACT	USE
b. To what extent does the concept impact existing utilities?	Numerous utility poles and manholes adjacent to Kamehameha Highway may need to be relocated/replaced to widen the sidewalk.	Buried utilities could restrict vertical alignment around the Bombproof Switch Station. Numerous utility poles and manholes adjacent to Kamehameha Hwy need to be avoided.	Buried utilities could restrict vertical alignment around the Bombproof Switch Station. Several utility poles may need to be relocated.	Minimal utility conflicts are present. Lights on the boathouse property may need relocation.
EVALUATION	IMPACT	MOST IMPACT	IMPACT	MINIMAL IMPACT
c. Is construction of the concept financially feasible and reasonable?³	Total Cost: \$3,381,240 Concept Cost: \$1,022,040	Total Cost: \$6,032,880 Concept Cost: \$3,673,680	Total Cost: \$6,916,320 Concept Cost: \$4,557,120	Total Cost: \$3,015,240 Concept Cost: \$656,040
EVALUATION	\$\$	\$\$\$	\$\$\$	\$\$
d. What is the complexity, difficulty, and duration of construction?	Construction of this concept is not complex, but would require some lane closures of Kamehameha Highway. The expected construction duration is approximately 3 months.	Construction of this concept would require substantial fill. The expected construction duration is approximately 3 months.	Construction of this concept is the most complex due to the need for a substantial cut and retaining wall adjacent to Boathouse property. The expected construction duration is approximately 4 months.	Construction of this concept is not complex, minimal earthwork required. The expected construction duration is approximately 2 months.
EVALUATION	COMPLEX	COMPLEX	MOST COMPLEX	LEAST COMPLEX

³ \$ = \$0-3,000,000, \$\$ = \$3,000,000-6,000,000 , \$\$\$ = \$6,000,000+

Bombproof Switch Station to AMD Concepts	Improved No Action (along Kamehameha Highway)	Concept 1 – Around Bombproof Switch Station to Richardson Field	Concept 2 – Around Bombproof Switch Station to AMD	Concept 3 – Along Navy Admiral's Boathouse Property to AMD (Historic Alignment)
1. Fulfill Purpose and Need- Improve Pedestrian and Bicycle Mobility				
a. Direct pedestrian and bicycle connection to VALR	LESS DIRECT	LESS DIRECT	SOMEWHAT DIRECT	MOST DIRECT
b. Direct pedestrian and bicycle connection to the HART station	MOST DIRECT	MOST DIRECT	LESS DIRECT	LESS DIRECT
c. Support broader recreational and access PHHT goals	LESS SUPPORTIVE	LESS SUPPORTIVE	LESS SUPPORTIVE	SUPPORTIVE
2. Fulfill Purpose and Need- Improve Safety for Trail Users				
a. Potential for conflicts between vehicles and pedestrians/ bicyclists	POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT	LESS POTENTIAL FOR CONFLICT
b. User safety/security concerns	CONCERN	CONCERN	CONCERN	MINIMAL CONCERN
c. Trail profile requirement concern	MINIMAL CONCERN	CONCERN	MINIMAL CONCERN	MINIMAL CONCERN
3. Fulfill Purpose and Need- Minimize Environmental Impacts				
a. Compatible with previous plans	LESS COMPATIBLE	LESS COMPATIBLE	COMPATIBLE	COMPATIBLE
b. Impact previously undisturbed land	IMPACT	MOST IMPACT	IMPACT	LEAST IMPACT
c. Impact sensitive plant and animal species	MINOR IMPACT	MOST IMPACT	MOST IMPACT	LEAST IMPACT
d. Impact cultural resources	MINOR IMPACT	IMPACT	IMPACT	IMPACT
e. Impact hazardous materials	NO IMPACT	POTENTIAL IMPACT	POTENTIAL IMPACT	POTENTIAL IMPACT
4. Stakeholder and Public Support				
a. Public support	LOWER SUPPORT	LOWER SUPPORT	LOWER SUPPORT	SUPPORT
5. Cost and Constructability				
a. Impact and use to existing Right-of-Way	USE	NEW USE AND IMPACT	NEW USE AND IMPACT	USE
b. Impact existing utilities	IMPACT	MOST IMPACT	IMPACT	MINIMAL IMPACT
c. Financially feasible and reasonable	\$\$	\$\$\$	\$\$\$	\$\$
d. Complexity, difficulty, and duration of construction	COMPLEX	COMPLEX	MOST COMPLEX	LEAST COMPLEX
Summary Recommendation	Not Recommended to Advance	Not Recommended to Advance	Not Recommended to Advance	Recommended to Advance

5. Recommendations

The concept recommended for advancement into the next phase of project development is Concept 3- Along Navy Admiral's Boathouse Property to AMD. This is the alignment that was historically in place connecting from the existing PHHT fence along the Navy Admiral's Boathouse Property to AMD, but with modifications. This section represents one recommended portion of the trail, along with the recommended Richardson Access Road Segment and the improvements along AMD. Together, these three segments would provide bicycle and pedestrian access between the future HART station, the PHHT, and VALR (via AMD).

Concept 3 is recommended for advancement for the following reasons:

- **Pedestrian and Bicycle Mobility:**
 - Level of Direct Bicycle and Pedestrian Connection to VALR and to HART: Concept 3 would provide the most direct alignment from the existing PHHT terminus to the VALR site. Although other options would more directly link the existing PHHT (at the bombproof switch station) to HART, these options are not ideal due to the proximity to Kamehameha Highway. The Richardson Road segment would provide the linkage needed between HART and VALR.
 - Level of support for broader recreational and access goals for the PHHT: Concept 3 would provide a more direct linkage to VALR, and would have fewer environmental impacts than Concepts 1 and 2.
- **Improve Safety for Trail Users:**
 - **Potential for Conflict with Vehicles:** Concept 3 would include a protected fence area separate from vehicles.
 - **User Safety:** Compared to the other concepts, Concept 3 would not have highway safety or visibility concerns. The alignment could result in a narrow tunnel feeling for users due to fencing required on both sides of trail through boathouse grounds; design measure should be considered to minimize this fencing impact.
 - **Trail Profile:** Due to the flat grade of Concept 3, this concept is safer than the others that require steep grades.
- **Minimize Environmental Impacts:**
 - **Undisturbed Lands:** Concept 3 extends along the historic trail alignment, and thus requires minimal impact to undisturbed lands compared to Concepts 1 and 2.
 - **Sensitive Species:** Fewer tree removals are anticipated as compared to concepts that cross behind the bombproof switch station.

- **Cultural Resources:** This concept avoids impact to the area surrounding the Bombproof Switch Station and Richardson Field. However, evaluation of impacts to the Admiral's Boathouse property, would be required. All concepts would require both Section 106 and Section 4(f) coordination. Further consultation is needed with the Navy to discuss potential impacts to the Admiral's boathouse property under Concept 3.
- **Hazardous Materials:** The alignment for this design concept requires relocation of a storage shed in front of the Bombproof switch station, which may contain hazardous materials. Additional field work (including a Phase 1 or similar analysis) is needed in the future to understand the extent of the impact.
- **Stakeholder and Public Support:**
 - **Public Support:** The public's opinion at a November 2016 public meeting for the project was to open the gates and allow bicyclists and pedestrians to pass through the Admiral's Boathouse parking lot. The study team advised those at the meeting that opening the gates to the existing Admiral's Boathouse parking and providing unrestricted access would have a low probability of approval by the Navy. It was suggested that the study team look for options that pass between the Admiral's Boathouse parking and the Bombproof Switch Station. This option became referred to as Concept 3 in subsequent analysis. There was support for this option since it is the most direct route (follows the historic trail alignment prior to 2001 closure) and avoids safety concerns posed by crossing behind the Bombproof Switch Station.
 - **Consistency with Navy Preferences:** ~~Concept 3 was assessed to be of lower preference from the Navy based on conversations and meetings to-date due to the proximity of the trail to the Admiral's Boathouse.~~ At the time of the concept development and project evaluation, Concept 3 was supported for consideration by the agencies involved and the public. At a site visit held with the CFLHD, the City and County of Honolulu, the Navy and bike advocacy leaders on November 10th, 2016, support was expressed for Concept 3. Since that time, the Navy has stated that the Concept 3 alignment is unacceptable due to potential security concerns.

~~Additional follow-up discussions are necessary to evaluate mitigation options to help address this potential security impact to understand if they may be mitigated through design options and appropriate security measures.~~

- **Cost and Constructability:**

- **Impact to Right-of-Way:** All of the concepts would require use of right-of-way from varying agencies (state, Navy, etc.). Concept 3 would closely follow the historic trail Navy parcel use and require using the fewest number of impacts to agency parcels.
- **Impact to Utilities:** Compared to the other concepts, Concept 3 would require fewer utility conflicts. The other concepts would encounter buried utilities and conflicts with Kamehameha Highway utility infrastructure.
- **Cost:** Concept 3 has the least cost compared to all other concepts. Total costs for the project would be \$3,019,040 (Assuming costs for Richardson Road - \$863,000, AMD - \$1,500,000, and Concept 3 - \$656,040) as shown in Appendix C.
- **Complexity of Construction:** Concept 3 would be the least complicated to construct as it avoids disruption to Kamehameha Highway and extends primarily adjacent to an existing parking lot and utilizes an existing path. The construction duration is the lowest of the other three concepts evaluated for this segment of trail.

Concept 3 is shown in Figure 5 and in Figure 6. Additional cost detail is provided in Appendix B: Cost Estimates and rendering and design detail in Appendix C: Recommended Concept Supporting Documentation.

6. Next Steps

The City and County of Honolulu submitted a FLAP application in the 2017 HI FLAP Call for Projects for Phase II of the HI FLAP PHHT Connections project as a continuation of the work conducted in this Phase I- Study. The Phase II scope of work included completion of NEPA and engineering of the full project including design concepts from the existing PHHT to VALR and the Aloha Stadium.

The HI FLAP Programming Decision Committee (PDC) selected and tentatively programmed this Phase II application stipulating the identification of construction funding of the conceptual alignment identified in Phase I prior to final programming. Therefore, from this PDC requirement the following contingent action items must be completed by the City and County prior to advancing to Phase II- NEPA and Design.

1. Determination of which Bombproof Switch Station to AMD Concept will advance.
2. Grant of easement coordination strategy with the Navy to include the extension of the PPHT project area.

To complete these action items and advance the project, will require coordination between the City and County of Honolulu and Navy to confirm the preferred design concept that will be advanced and ensure it is eligible for federal funds that is contingent upon a grant of easement extension. Coordination with CFLHD will be necessary to appropriately respond to the PDC. In addition, coordination with CFLHD to present the accepted design concept to be advanced in Phase II- NEPA and Design to the NPS.

Figure 5 – Recommended Concept for Advancement (Concept 3)

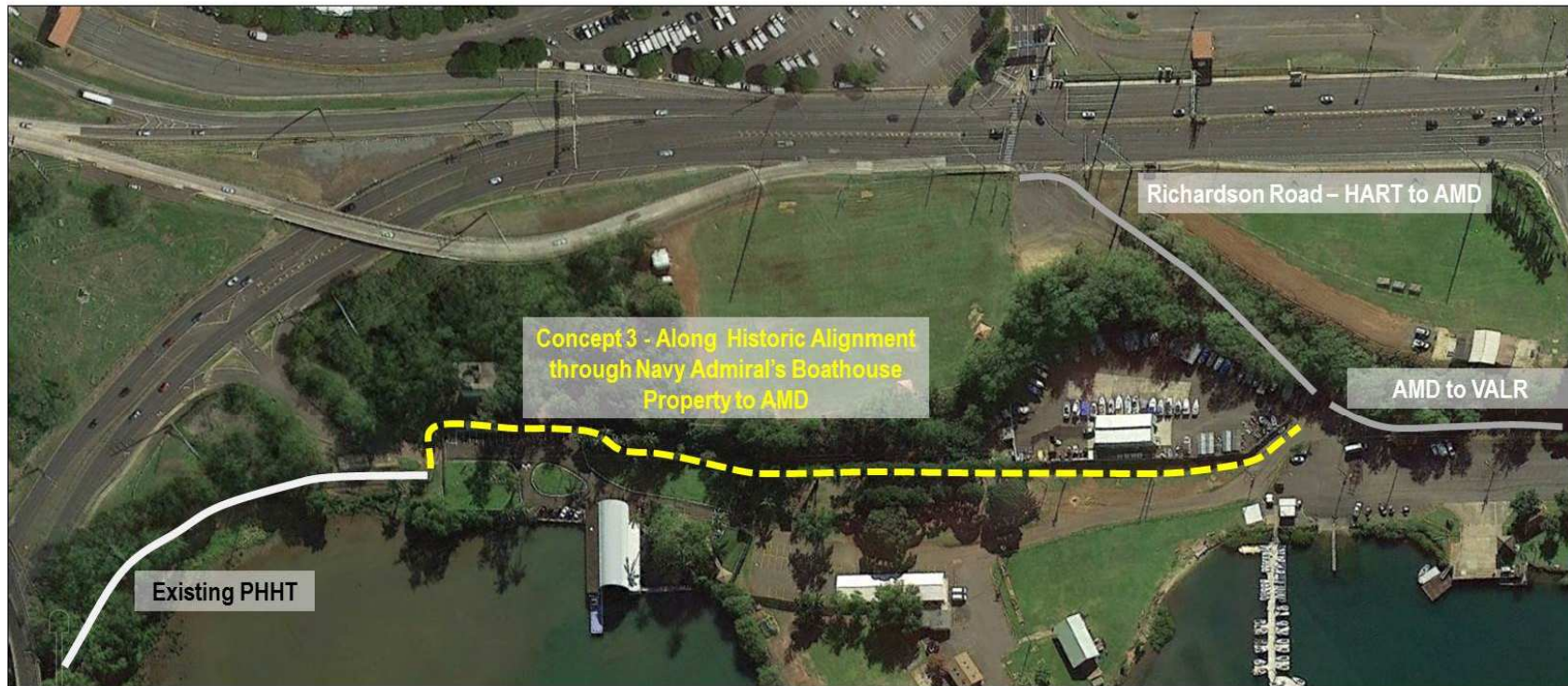
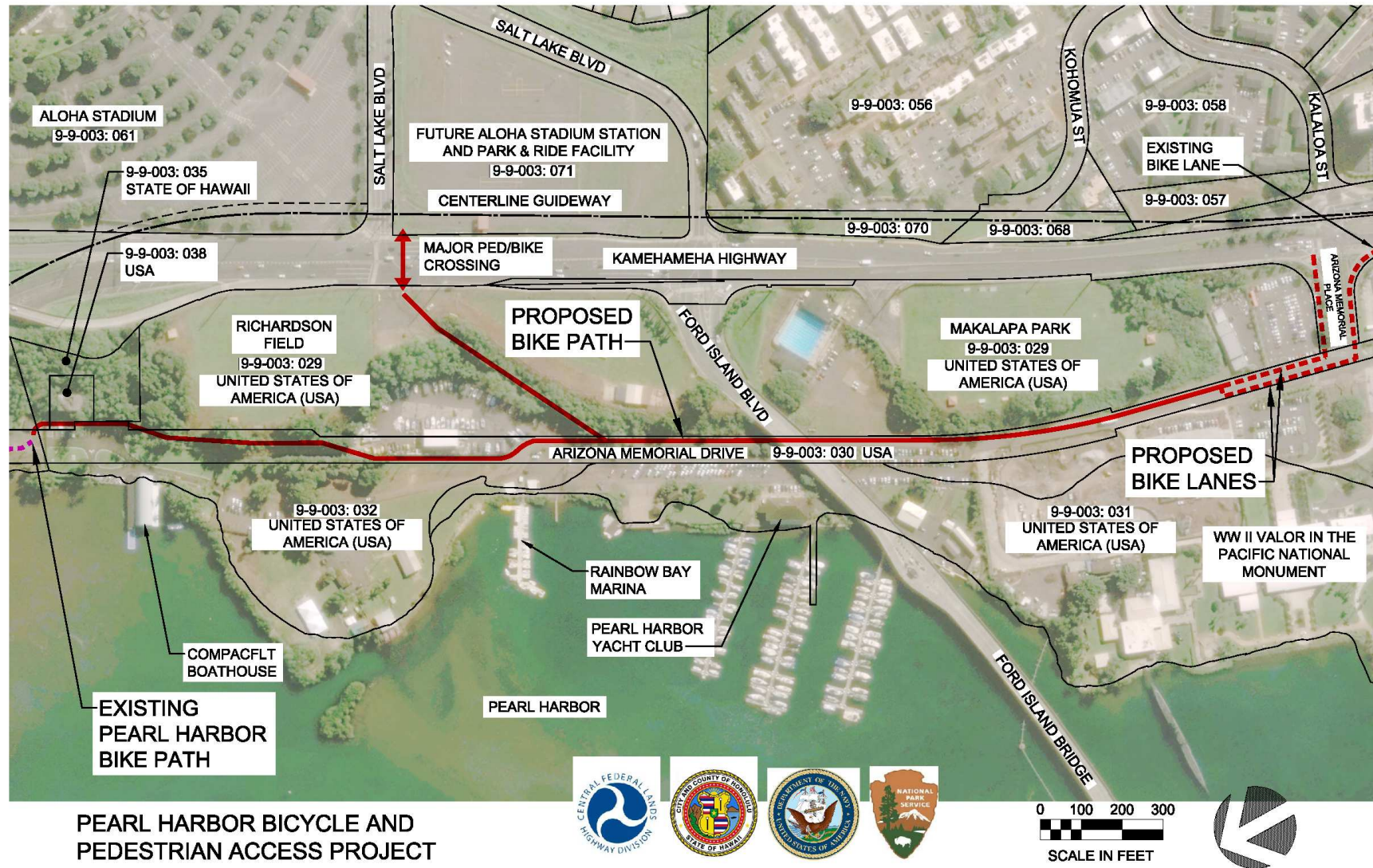


Figure 6 – Recommended Concept Alignment



7. Appendices

7.1 Appendix A. Environmental Issues Summary

The following documents the type of future environmental documentation necessary per federal requirements; a summary of environmental resources located in the project area, and next steps for future environmental analysis and documentation. The primary resources of concern for this project include:

- Impacts to sensitive plant and animal species
- Impacts to cultural resources
- Impacts to existing parks and recreational resources
- Impacts to hazardous materials
- Impacts to utilities

Further detail is provided in Figure 7 and Figure 8 and in **Table 5** below.

Figure 7 – Near Bombproof Switch Station



Figure 8 – Near Admiral's Boathouse and VALR



Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
SUMMARY		
Type of NEPA document anticipated	CE	CFLHD will be the federal NEPA lead developing the NEPA document. Likely NEPA document will be a Categorical Exclusion (CE), as it appears that any impacts can be reduced to less than significant with mitigation.
Hawaii Revised Statute (HRS) 343 HEPA required (HI Projects)?	Yes	The HRS 343 HEPA document will be prepared by the City and County of Honolulu, Department of Transportation Services (DTS). An Environmental Assessment (EA) will be required because a Special Management Area (SMA) Major Permit is required. When an SMA Major Permit is required an assessment must be made even if the project is otherwise exempt from the requirements of HRS Chapter 343, as required by ROH Section 25-3.3(c)(1). The Draft EA will be processed in accordance with the procedures enumerated in Subchapter 6 of Chapter 200, Title 11, Hawaii Administrative Rules (HAR).
NPS - Environmental Screening Form (ESF) required?	No	The project is not located in National Park Service land; therefore, an ESF is not required.
Potential use of programmatic agreements?	Unknown	The ability to use programmatic agreements with other federal agencies will need to be determined in conjunction with CFLHD.
Public involvement required?	Yes	Public involvement will be conducted as part of the design process. Public involvement is not required for either a NEPA CE or a HRS 343 HEPA Declaration of Exemption. Public involvement may be required as part of the Section 106 process, Special Management Area (SMA) Permit process, and Coastal Zone Management Act Federal Consistency determination process. The CZMA Federal Consistency Determination process includes a public comment period and the SMA Major Permit process includes a public hearing.
AIR QUALITY		
Non-attainment or maintenance area?	No	The State of Hawaii is in attainment for all National Ambient Air Quality Standards (NAAQS) (DOH 2014).
Exempt from conformity requirements?	Yes	The State of Hawaii is in attainment for all NAAQS, and therefore exempt from the required conformity analysis.

Table 5: Environmental Resources Summary

Description	Response	Comment
If conformity applies, is the project included in the STIP or regional TIP?	Yes	The project is exempt from the required conformity analysis, as the State of Hawaii is in attainment for all NAAQS. ~~The project is not included in the July 2016 O'ahu Metropolitan Planning Organization Federal Fiscal Year 2015-2018 TIP.~~ Parts of the project are covered under several elements of the current Statewide Transportation Planning Program (STIP). These elements are: S-8 Organization Federal Fiscal Year 2015-2018 TIP. The elements are S-8: Federal Lands Highway Access Discretionary Program and OC22: Pedestrian Transit Connections. Additional funds may need to be programmed to cover all elements of the project.
Adding or removing lanes, signalization, and/or alignment changes?	No	
State or local air quality studies required?	No	

BIOLOGICAL RESOURCES

Local knowledge of federal T&E or candidate species in the area?	Yes	The 2011 Joint Base Pearl Harbor-Hickam, O'ahu Integrated Natural Resources Management Plan (INRMP) provides information on federally threatened and endangered species and candidate species at Pearl Harbor Naval Complex (PHNC), which includes the proposed project site. The project will not involve any marine or shoreline work; therefore, impacts to listed marine species will be avoided. The following are federally listed terrestrial species present at PHNC: • Hawaiian duck (<i>Anas wyvilliana</i>) • Hawaiian common moorhen (<i>Gallinula chloropus sandvicensis</i>) • Hawaiian coot (<i>Fulica alai</i>) • Hawaiian stilt (<i>Himantopus mexicanus knudseni</i>) • Hawaiian hoary bat (<i>Lasiurus cinereus semotus</i>) A current USFWS species list will be needed to identify recent additions or updates. Seven species of Hawaiian yellow-faced bees and 39 plants from the Hawaiian Islands were federally listed on October 31, 2016.
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Table 5: Environmental Resources Summary

Description	Response	Comment
Potential for suitable habitat of any listed species in/near the project area?	Yes	There is no suitable habitat for the federally endangered Hawaiian ducks, Hawaiian common moorhen, Hawaiian coot, or Hawaiian stilt (collectively referred to as Hawaiian waterbirds) within the project area. However, there is suitable habitat for Hawaiian waterbirds along the shoreline of PHNC near the project site. Hawaiian stilts have been observed foraging on the mudflats along the Pearl Harbor shoreline, near the project site. There is suitable habitat for the Hawaiian hoary bat in the project area, including trees that are greater than 15 feet tall, which are suitable for bat roosting and rearing of pups.
Designated critical habitat in the project area?	No	No critical habitat has been designated for any of the species identified in the INRMP or for the insect and plant species listed on October 31, 2016.
Local knowledge of state protected species in the area?	Yes	The INRMP provides information on state listed species at PHNC, which includes the proposed project site. The project will not involve any marine or shoreline work; therefore, impacts to listed marine species will be avoided. The following are state listed terrestrial species present at PHNC: • White tern (<i>Gygis alba</i>) • Hawaiian short-eared owl (<i>Asio flammeus sandwichensis</i>) All species protected under the federal Endangered Species Act are also protected under the Hawaii Endangered Species Law. Will need to request most recent Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFW) species list to identify recent additions or updates.
Adjacent to BLM or USFS land?	No	The proposed project is not adjacent to BLM or USFS land.
BLM or USFS sensitive species the FLMA is concerned about?	No	

Table 5: Environmental Resources Summary

Description	Response	Comment
Migratory bird nest observed in the project area?	Yes	Potential nesting sites for migratory birds are present at the project site. During a site visit on November 2, 2016, the following Migratory Bird Treaty Act (MBTA) species were observed: cattle egret (<i>Bubulcus ibis</i>) and Pacific golden plover (<i>Pluvialis fulva</i>). Other MBTA species may be present, such as, White tern.
Wildlife or aquatic organism passage issues?	No	The project will not involve any stream crossings and therefore would not affect fish passage. There are no native terrestrial flightless mammals in Hawaii, and no terrestrial flightless species that require movement over large areas or utilization various habitat types. Furthermore, the proposed pedestrian/bicycle routes would be primarily adjacent and parallel to existing roadways. Therefore, the movement of native species would not be affected by the proposed project.
Located within 100 miles of the coast?	Yes	The project area is within 100 miles of the coast; however, the project will not involve any in-water or shoreline work. Therefore, no species under the jurisdiction of NOAA Fisheries would be affected.
Known noxious weed occurrences or concerns regarding noxious weeds?	No	The proposed project would not result in the spread of noxious weeds. Invasive mangroves grow along the shoreline of PHNC, outside the project area, and would not be affected by the project. Other weeds present at the site include: Guinea grass (<i>Magathyrus maximus</i>), Chinese violet (<i>Asystasia gangetica</i>), kiawe (<i>Prosopis pallida</i>), Manila tamarind (<i>Pithecellobium dulce</i>) and koa haole (<i>Leucaena leucocephala</i>). All of these species are common and widespread across O'ahu.
Biological resource surveys required?	No	An AECOM biologist visited the site on November 2, 2016. The majority of the project area is developed. Undeveloped areas are dominated by non-native invasive plant species. No suitable habitat for protected species was identified. A final determination regarding the potential presence of suitable habitat for protected species can be determined, through consultation with USFWS and DOFAW.

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Is a BA/BE required?	Yes	A BE will be required to support Section 7 consultation with USFWS and consultation with DOFAW. As this is a minor construction project that would not significantly affect listed species and/or the quality of the human environment, a BA would not be required.
CULTURAL RESOURCES		
New ground disturbance outside the existing roadway prism?	Yes	Varies by concept. Concepts 1 and 2 require the most extensive ground level disturbance due to the alignment that extends behind the Bombproof switch station.
Previously surveyed for cultural resources?	Unknown	The NAVFAC HI Cultural Resources Manager confirmed that the Navy has not undertaken detailed archaeological surveys in this area due to the extensive disturbance from cut and fill and development that occurred during the World War II period.

Table 5: Environmental Resources Summary

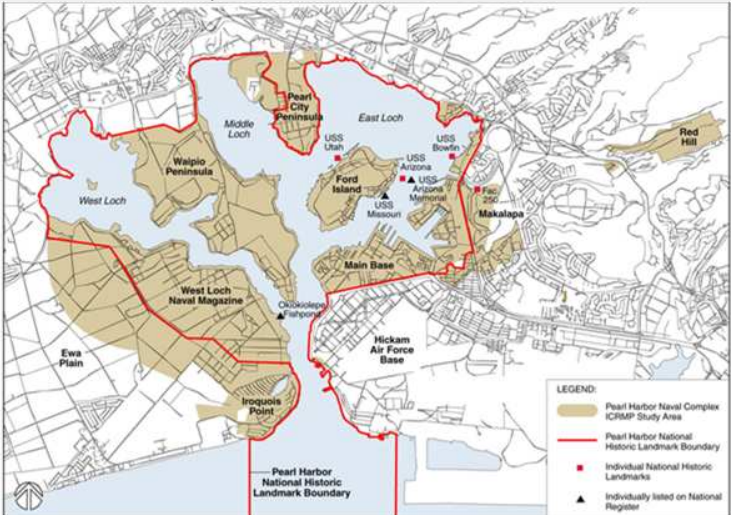
<u>Description</u>	<u>Response</u>	<u>Comment</u>
Evaluated for eligibility for the National Register of Historic Places (NRHP)?	Yes	The project area lies within the listed Pearl Harbor National Historic Landmark boundary. The boundary for the U.S. Naval Base Pearl Harbor National Historic Landmark (PHNHL) was officially defined in 1974 and certified in 1978 by the Heritage Conservation and Recreation Service, U.S. Department of the Interior. The boundary was delineated to “include those water and land areas historically, intimately, and directly associated with its function” as an active naval base with mission to support the Pacific Fleet. The PHNHL boundary is shown on the figure below. As noted above, this ICRMP extends to properties outside PHNHL. (Source: NAVFAC Hawaii ICRMP 2008, 1-6)  The map shows the Pearl Harbor National Historic Landmark Boundary in red. Key areas labeled include Pearl City Peninsula, Middle Loch, East Loch, West Loch, Waipio Peninsula, Ford Island, Main Base, Hickam Air Force Base, Ewa Plain, and Iroquois Point. A legend in the bottom right corner identifies the Pearl Harbor Naval Complex ICRMP Study Area (yellow), the Pearl Harbor National Historic Landmark Boundary (red line), individual National Historic Landmarks (red squares), and individually listed National Register landmarks (black triangles).

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Properties (buildings, bridges, trails, etc.) thought to be older than 50 years?	Yes	Historic facilities in the project vicinity include the following. Richardson Field recreational facilities: • Fac. 1 Recreation facility/Club House • Fac. 2 Bath House/Locker Room • S21 Swimming Pool – Richardson Rec. Center Facilities at Admiral's Boathouse area: • Fac. 6 Bombproof Switch Station G • Fac. 23 CINCPACFLT Boathouse • S22 Finger Pier/CINCPACFLT Boat Landing These are all surveyed as older than 50 years. They are classified by the Navy as Historic Category III, defined as possessing sufficient historic significance to merit consideration in planning and decision making, but having only minor importance for defining the historic character of the installation. These resources generally are support structures, not major facilities and also may have diminished historic integrity. They may have potential for continuing or adaptive reuse.
Apparent / unique / suspect structures of possible historical interest?	No	All structures have been identified and evaluated by Navy in ICRMP and other studies. No unevaluated, possible historic structures are known to be present.
Tribes who will have an interest in the project?	Unknown	Possible Native Hawaiian interest. According to the ICRMP, the coastline of Pearl Harbor was generally an important area for habitation and activities such as aquaculture in the pre-contact period. Historically, there were I'oi (fishponds) along portions of the shoreline. The project area is near what was once the location of the fishpond known as Loko Pohaku, however, the former pond location was extensively modified with cut and fill and development so that no trace of it has been identified as remaining today (based on information provided by NAVFAC HI Cultural Resources Manager, Dec. 9, 2016).
Traditional Cultural Properties (TCPs) in the area?	Unknown	No Traditional Cultural Properties are documented as being present in this area. The area is described as lacking archaeological integrity, and has been heavily modified with Navy development since prior to World War II.

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Cultural resource surveys required?	Unknown	According to the NAVFAC HI ICRMP and Cultural Resources Manager, this area is considered to be low potential for archaeological resources due to extensive disturbance ongoing since prior to World War II. It is unlikely that surveys would be required but construction monitoring by an archaeologist would likely provide appropriate mitigation.
ENERGY		
Affect energy use as a result of changes to traffic patterns or volumes, or involve speed zone changes?	No	
GEOLOGY		
Do discussions with Geotechnical staff indicate any concerns?	No	
Is drilling / exploration anticipated?	No	

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
HAZARDOUS MATERIAL		
Hazardous sites in the project area?	Yes	State of Hawaii Department of Health (HDOH), Hazard Evaluation & Emergency Response (HEER) Office records for TMKs (1) 9-9-003:038, (1) 9-9-003:025 and (1) 9-9-012:004 were reviewed. <u>TMK (1) 9-9-003:035</u> TMK (1) 9-9-003:035 is the site of a former US Navy pump house. This property was transferred from the Navy to the State of Hawaii in 1962 (State of Hawaii 2000). In 2001, mercury from deteriorated gauges in the pump house was collected by children and spread to the nearby Puuwai Momi Housing Complex. The HDOH conducted a response action at the former pump house between June 21, 2001 and July 6, 2001 (EPA 2010). Approximately 30 pounds of free mercury were recovered as a result of the cleanup at the pump house (EPA 2010). In December 2009, the HDOH determined that no further action was necessary at the pump house site (EPA 2010). HDOH HEER Office records also indicated TMK (1) 9-9-003:035 was the site of both an above ground fuel storage tank and an underground fuel storage tank (UST). A final work plan for removal of the storage tanks was prepared in 2001 (State of Hawaii 2002). No records confirming the removal of the UST have been identified. Further, HDOH HEER Office records indicate polychlorinated biphenyl (PCB) may be present at the site (EnviroWatch 2001). No records confirming the remediation of PCBs have been identified. During the recent site visit, signage identifying a petroleum pipeline on the property was observed. The sign identifies Par Hawaii Refining as the owner or operator of the pipeline. A cage owned by Chevron Products Co. containing infrastructure associated with the pipeline is also present on the property. Further investigation and coordination with both the HDOH HEER Office and property owners will be needed to determine the status of hazardous materials and contamination at the site. <u>TMK (1) 9-9-003:038 & (1) 9-9-012:004</u> The HDOH HEER Office had no records for TMK (1) 9-9-003:038 and (1) 9-9-012:004. A Phase 1 Environmental Site Assessment of all properties within the project area is recommended. Based on the findings of the Phase 1, a Phase 2 Environmental Site Assessment may be required.

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Known or possible hazardous waste on the project ()?	Yes	TMK (1) 9-9-003:038 is the site of Navy Building 6, a World War II era “bombproof.” The building is a former generator switch station. Given the age of the building and prior use, lead paint, asbestos, PCB and other hazardous materials may be present. Further investigation and coordination with the property owner will be needed to determine the status of possible hazardous waste at the site.
Structure with potential to contain hazardous material be altered or demolished?	Yes	A small storage shed located on TMK (1) 9-9-003:038 may need to be demolished and/or relocated. The shed is located in front of the Bombproof switch station. The shed has the potential to contain hazardous materials and will require further investigation.
LAND USE / PLANNING		
Require land use actions from FLMA or local jurisdictions?	Yes	No actions from FLMAs are required, as the project does not overlap National Park land, Forest Service land, or BLM land. Right-of-way easements for the U.S. Navy and State of Hawaii DLNR will be required.
Concerns regarding consistency with federal, state, or local land use policies or plans?	No	Previous plans indicated the need to improve pedestrian/bicycle mobility through the area. Thus, a new path would comply with existing land use plans and policies. The required jurisdictional approval will ensure compliance with existing plans and policies.
Coastal Zone Management Act apply?	Yes	Section 307 Coastal Zone Management Act requiring federal consistency will be required for the project. Generally, federal consistency requires that federal actions, within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. The State of Hawaii Coastal Zone Management Program includes a Special Management Areas (SMA) permitting system. The proposed development is located within a SMA and will require a SMA permit in accordance with Hawaii Revised Statutes (HRS) Chapter 205A. A SMA Major permit will be required because the project valuation exceeds \$500,000.

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Result in the conversion of prime farmland, unique farmland, or land of statewide or local importance as defined by Farmland Protection Policy Act?	No	There is no farmland, unique farmland, or land of statewide or local importance as defined by Farmland Protection Policy Act in or near the project area.
Any other specially designated or protected lands that may be affected?	No	
NOISE		
Will there be any shift in horizontal or vertical alignment?	No	The path is designed for bicycles and pedestrian use. There will be no shift in the horizontal or vertical alignment of vehicular roadways.
Does project increase the number of through travel lanes?	No	The path is designed for bicycles and pedestrian use. There will be no increase in the number of through vehicular travel lanes.
Roadway located on a new alignment?	No	The project does not involve any new vehicular roadways and/or realignment of existing vehicular roadways.
Removal of topographical features which currently shield receptors?	No	The majority of the path will run parallel to and at grade with existing roadways. Grading, construction of small retaining walls, and modification of existing topographic features will be required for the construction of the path. No topographic features that provide shielding of receptors will be altered or removed.

Table 5: Environmental Resources Summary

Description	Response	Comment
Are there buildings/ activity areas within 200 feet of proposed right of way line:	Yes	There are no residences, schools or churches within 200 feet of the proposed right of way line. Facilities within 200 feet of the proposed right of way line include: • Admiral's Boathouse • Aiea Bay State Recreation Area • Richardson Field • Makalapa Park • WWII Valor in the Pacific National Monument • Rainbow Bay Marina • Pearl Harbor Yacht Club • Aloha Stadium Rail Station • Restaurant 604
SECTION 4(f)		
Parks, wildlife refuges, historic properties, recreational areas, campgrounds, trails, etc. that may be impacted?	Yes	The applicability of Section 4(f) will need to be confirmed. The proposed project is an extension of the existing Pearl Harbor Historic Trail/Bike Path. Designated parks and recreation areas include Aiea Bay State Recreation Area, Richardson Field and Makalapa Park. Assess to these recreation areas may be temporarily impacted during construction of the path. Once complete the path will provide access to and complement these recreation areas. Several historic properties are located in the vicinity of the proposed path. See Cultural Resources section for more information on historic properties. Neither construction nor operation of the path is anticipated to impact historic properties.
SECTION 6(f)		
Land & Water Conservation Funds used to acquire parks, or to make improvements, etc.?	No	
SOCIOECONOMICS		
Building displacements or relocations?	No	A small storage shed located on Navy property (TMK (1) 9-9-003:038) may need to be demolished and/or relocated under Concept 3. The relocation and/or demolition of the storage shed would have no effect on the community.
Right of way be required for the project?	No	Easements on U.S. Navy and State of Hawaii DLNR property will be required. New right-of-way will not be required.

Table 5: Environmental Resources Summary

<u>Description</u>	<u>Response</u>	<u>Comment</u>
Divide or disrupt an established community, or affect neighborhood character or stability?	No	
Affect minority, elderly, handicapped, low income, transit-dependent, or other specific interest group?	No	The proposed path will meet Americans with Disabilities Act (ADA) requirements. The proposed extension will connect the existing Pearl Harbor Bike Path to the Aloha Stadium Rail Station, improving access and connectivity for transit-dependent groups.
VISUAL		
Designated state or federal scenic route?	No	
Major cuts/fills associated with this project?	No	No major cut or fill will be required. Grading will be required. Minor cut and fill may be required.
Bridges or large retaining walls anticipated?	No	No bridges will be required. Small retaining walls may be required.
Affect waterways designated as National Wild and Scenic Rivers?	No	
WATERWAYS / WATER QUALITY		
Within FEMA 100-year floodplain?	Yes/No	The project area is not located within a FEMA 100-year floodplain. The project area is located within Flood Zone D. Zone D designation is used for areas where there are possible, but undetermined hazard and no analysis of flood hazard has been conducted
Within FEMA regulated floodway?	No	The project area is not located within a FEMA regulated floodway. The project area is located within Flood Zone D. Zone D designation is used for areas where there are possible, but undetermined hazards and no analysis of flood hazard has been conducted

Table 5: Environmental Resources Summary

Description	Response	Comment
Water quality impaired stream (303(d) listed) impacted?	Yes/No	There are no waterways within the project area. The project area is adjacent to the East Loch of Pearl Harbor. Pearl Harbor is an impaired marine water on the States 303(d) list. Pearl Harbor is in nonattainment for the following pollutants: total nitrogen, total phosphorus, and chlorophyll a. There is insufficient data to determine attainment for enterococci, total nitrate and nitrite, and ammonium. A total maximum daily load has not been established. During construction, best management practices will be implemented to avoid impacts to the water quality of Pearl Harbor.
Outstanding Resource Waters affected?	No	
Active well impacted?	No	
Navigable waterway(s) within the project area?	No	There are no navigable waterways within the immediate project area. The project area is adjacent to Pearl Harbor, a navigable waterway.
Irrigation ditches impacted?	No	
State or National Wild and Scenic River?	No	
WETLANDS AND WATERS OF THE U.S.		
Intermittent streams, ephemeral drainages, or perennial rivers/streams?	No	There are no intermittent streams, ephemeral drainages, or perennial rivers/streams in the project area. There is a small open stormwater drainage channel that receives stormwater runoff from Kamehameha Highway and discharges into Pearl Harbor.
Wetlands mapped on the Nationals Wetlands Inventory (NWI)?	No	The USFWS NWI map for the project area has been reviewed. There are NWI mapped wetlands in the project area. The map identifies “Estuarine and Marine Wetlands” along the shoreline of Pearl Harbor, near the northern end of the project area. Based on field observations, these wetlands are comprised of mudflat and invasive mangroves. These wetlands will not be impacted by any of the concepts under consideration.
Blue line features from the National Hydrographic Datum (NHD)?	No	The NHD map for the project area has been reviewed. There are no blue line features within the project area. The nearest blue line features is Aiea Stream located approximately 500 feet northwest of the project area.

Table 5: Environmental Resources Summary

Description	Response	Comment
Riparian or wetland vegetation evident from visual inspection?	No	There is no riparian or wetland vegetation present in the project area. Invasive mangroves, a wetland species, grow along the shoreline near the north end of the project area. The mangroves will not be affected by construction or operation of the path.
Delineation of waters of the U.S. including wetlands and other special aquatic sites need to be completed for the project area?	No	Given the absence of wetland vegetation in the project area, a wetland delineation will not be required. Both the USFWS NWI map and the 2007 Pearl Harbor Wetland Inventory report do not identify any wetlands within the project area.
WILDERNESS		
Occur in or near designated wilderness?	No	
COST OR SCHEDULE		
Potential Major Impacts to Cost or Schedule	No	No major impacts to cost and/or schedule are anticipated. While not anticipated, hazardous materials or contamination may be present at the site; remediation of the site could be costly and time consuming. The process of obtaining regulatory authorizations could be time consuming.

A. PERMITS

Description		Comment
Section 404 / 401 Permit		
Discharge of dredge or fill into a water of the U.S.	No	No discharge of dredge or fill material into a water of the U.S. is proposed.
Discharge of fill into a perennial river/stream, intermittent stream, or ephemeral drainage?	No	No discharge of fill into perennial river/stream, intermittent stream, or ephemeral drainage is proposed. The bicycle path may need to cross a small open stormwater drainage channel that receives stormwater runoff from Kamehameha Highway and discharges into Pearl Harbor.
Discharge of fill into a pond or lake?	No	

Description		Comment
Discharge of fill into a special aquatic site including:?	No	No discharge of fill into special aquatic sites is proposed. Impacts to mudflats and mangroves located along the PHNC shoreline, outside the project area, will be avoided.
Water diversion needed?	No	
Channelization, channel realignment, or channel armoring required?	No	
Qualify for a Nationwide Permit (NWP)?	No	Not Applicable. No dredge or fill in a water of the U.S. is proposed; therefore, an U.S. Army Corps of Engineers permit is not required.
Comply with NWP general conditions?	No	Not Applicable. No dredge or fill in a water of the U.S. is proposed.
Comply with NWP regional conditions?	No	Not Applicable. No dredge or fill in a water of the U.S. is proposed.
Cause the loss of less than 1/2 acre of non-tidal waters of the U.S. or 1/3 acre of tidal waters of the U.S.?	No	Not Applicable. The project will not affect waters of the U.S.
Does the project require compensatory mitigation?	No	No dredge or fill in a water of the U.S. is proposed.
Would the project cause the loss of less than 1/10 acre of wetlands?	No	Not Applicable. The project will not affect wetlands.
Does the project require a LOP or IP for authorization?	No	Not Applicable. No dredge or fill in a water of the U.S. is proposed.
Any Corps-approved mitigation bank or in-lieu fee programs that service the project area?	No	Not applicable. No mitigation will be required.
NPDES Permit		
Amount of acreage disturbed?	> 1 ac & < 5 ac	More than 1 acre and less than 5 acres of ground disturbance is anticipated for construction of Concept 3. A Notice of Intent for coverage under the state's NPDES General Permit for the discharge of stormwater from construction activities will be required.
Subject to any state, county or local sediment/erosion management plan (MS4)?	Yes	The project area discharges into both Navy and State Municipal Separate Storm Sewer Systems (MS4s). Authorization to discharge stormwater runoff to these drainage systems will be required.

Description		Comment
Subject to a state or basin sediment/erosion management plan?	Yes	The project will comply with the City and County of Honolulu Storm Water Management Program Plan.
Cooperator willing to assume responsibility for the NPDES Permit upon completion of construction?	Yes	The City and County of Honolulu, DTS will assume responsibility for the NPDES Permit upon completion of construction.
Post-construction BMP requirements?	Yes	Post-construction BMPs will be required to provide for restoration and revegetation of disturbed areas and other measures to minimize erosion and sedimentation after construction. These requirements will be a component of the Storm Water Pollution Prevention Program (SWPPP) for the project.
Other Permits / Authorizations		
FLMA special use permit	No	The project would not be located on National Park, Forest Service, or BLM land; therefore, a FLMA Special Use Permit will not be required.
Staging area permit?	No	
Disposal/waste area permit ?	No	
Material source permit?	No	
Asphalt or concrete batch plant permit?	No	
Utility line or buried pipe permit?	No	No utility lines or buried pipes will be installed as part of the project. There is an existing petroleum pipeline running through a portion of the project area. Coordination with the Par Hawaii Refining, LLC will be required.
Dewatering permit?	No	
Water rights or appropriation approval?	No	
Local, County or State air quality permit	No	
County road access or encroachment permit?	No	
State highway access or encroachment permit?	Unknown	An HDOT encroachment permit may be required for improvements to the crossing at Kamehameha Highway.
Stream alteration permit?	No	

Description		Comment
Other	Yes	SMA Major Permit - The State of Hawaii Coastal Zone Management Program includes a SMA permitting system. The proposed development is located within the SMA and will require a SMA permit in accordance with Hawaii Revised Statutes (HRS) Chapter 205A. A SMA Major permit will be required because the project valuation exceeds \$500,000.

7.2 Appendix B. Cost Estimates

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT) - Improved No Action Option - Application Construction Estimate

Segment Name: Widened Sidewalk along Kamehameha Highway

Total Length = 1400 LF

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$78,035.98	\$78,035.98	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$6,503.00	\$6,503.00	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$19,123.32	\$19,123.32	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$6,374.44	\$6,374.44	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$13,006.00	\$13,006.00	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.5	ACRE	\$25,000.00	\$12,855.83	
20301.0000	REMOVALS	1.0	LS	\$20,000.00	\$20,000.00	Fence, Misc Concrete sidewalk
20402.0000	EMBANKMENT CONSTRUCTION	1,659.3	CUYD	\$100.00	\$165,925.93	Assume 2' depth for profile corrections and reconditioning
25101.2000	PLACED RIPRAP, CLASS 2	10.0	CUYD	\$90.00	\$900.00	
25210.0000	ROCKERY / CAST IN PLACE	0.0	SQYD	\$100.00	\$0.00	
25501.0000	MECHANICALLY STABILIZED EARTH WALL	0.0	SQFT	\$150.00	\$0.00	Various segments as shown on plans
25501.0000	SOIL NAIL WALL	0.0	SQFT	\$350.00	\$0.00	Various segments as shown on plans
30802.2000	ROADWAY AGGREGATE, METHOD 2	465.5	TON	\$40.00	\$18,620.00	
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	0.0	TON	\$225.00	\$0.00	4-inch trail
61501.0000	CURB AND GUTTER	500.0	LF	\$100.00	\$50,000.00	
61501.0100	SIDEWALK CONCRETE	1,555.6	SQYD	\$200.00	\$311,111.11	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	24.0	SQYD	\$350.00	\$8,400.00	
60201.0600	18-INCH PIPE CULVERT	50.0	LNFT	\$250.00	\$12,500.00	15 each @ 30-foot
60210.0600	END SECTION FOR 18-INCH PIPE CULVERT	2.0	EACH	\$1,500.00	\$3,000.00	
60704.0000	CLEANING CULVERT IN PLACE	1.0	EACH	\$2,000.00	\$2,000.00	
61901.0000	FENCE, CHAINLINK	300.0	LNFT	\$75.00	\$22,500.00	
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	20.0	hour	\$85.00	\$1,700.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY BUCKET, 24-INCH WIDTH	20.0	hour	\$120.00	\$2,400.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	20.0	hour	\$155.00	\$3,100.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	20.0	hour	\$135.00	\$2,700.00	
62301.0000	GENERAL LABOR	20.0	hour	\$60.00	\$1,200.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	20.0	hour	\$120.00	\$2,400.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	20.0	hour	\$120.00	\$2,400.00	
62510.2000	SEEDING, HYDRAULIC METHOD	0.5	acre	\$600.00	\$308.54	
62515.2000	MULCHING, HYDRAULIC METHOD	0.5	acre	\$2,000.00	\$1,028.47	
63301.0000	SIGN SYSTEM	10.0	EACH	\$500.00	\$5,000.00	
63308.0000	OBJECT MARKER	5.0	EACH	\$50.00	\$250.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$3,251.50	\$3,251.50	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$65,029.99	\$65,029.99	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$851,700	

Design/NEPA (10%) \$85,170.00

CM (10%) \$85,170.00

Total \$1,022,040.00

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT) - Concept 1 - Application Construction Estimate

Segment Name: Concept 1 - Around Bombproof Switch Station to Richardson Field

Total Length = 1120 LF

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$282,827.50	\$282,827.50	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$23,568.96	\$23,568.96	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$70,114.59	\$70,114.59	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$23,371.53	\$23,371.53	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$47,137.92	\$47,137.92	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.8	ACRE	\$25,000.00	\$19,742.88	
20301.0000	REMOVALS	1.0	LS	\$20,000.00	\$20,000.00	Fence, Misc Concrete
20402.0000	EMBANKMENT CONSTRUCTION	17,437.0	CUYD	\$100.00	\$1,743,703.70	Assume 2' depth
25101.2000	PLACED RIPRAP, CLASS 2	10.0	CUYD	\$90.00	\$900.00	
25210.0000	ROCKERY / CAST IN PLACE	0.0	SQYD	\$100.00	\$0.00	
25501.0000	MECHANICALLY STABILIZED EARTH WALL	2,250.0	SQFT	\$150.00	\$337,500.00	along large fill slope to eliminate fill on navy property
25501.0000	SOIL NAIL WALL	0.0	SQFT	\$350.00	\$0.00	
30802.2000	ROADWAY AGGREGATE, METHOD 2	372.4	TON	\$40.00	\$14,896.00	
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	273.8	TON	\$225.00	\$61,600.00	4-inch trail
61501.0000	CURB AND GUTTER	0.0	LF	\$100.00	\$0.00	
61501.0100	SIDEWALK CONCRETE	0.0	SQYD	\$200.00	\$0.00	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	16.0	SQYD	\$350.00	\$5,600.00	
60201.0600	18-INCH PIPE CULVERT	150.0	LNFT	\$250.00	\$37,500.00	2 - 75' pipes across large fill
60210.0600	END SECTION FOR 18-INCH PIPE CULVERT	2.0	EACH	\$1,500.00	\$3,000.00	
60704.0000	CLEANING CULVERT IN PLACE	2.0	EACH	\$2,000.00	\$4,000.00	
61901.0000	FENCE, CHAINLINK	1,120.0	LNFT	\$75.00	\$84,000.00	
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	20.0	HOUR	\$85.00	\$1,700.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY BUCKET, 24-INCH WIDTH	20.0	HOUR	\$120.00	\$2,400.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	20.0	HOUR	\$155.00	\$3,100.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	20.0	HOUR	\$135.00	\$2,700.00	
62301.0000	GENERAL LABOR	20.0	HOUR	\$60.00	\$1,200.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	20.0	HOUR	\$120.00	\$2,400.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	20.0	HOUR	\$120.00	\$2,400.00	
62510.2000	SEEDING, HYDRAULIC METHOD	0.8	ACRE	\$600.00	\$473.83	
62515.2000	MULCHING, HYDRAULIC METHOD	0.8	ACRE	\$2,000.00	\$1,579.43	
63301.0000	SIGN SYSTEM	10.0	EACH	\$500.00	\$5,000.00	
63308.0000	OBJECT MARKER	30.0	EACH	\$50.00	\$1,500.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$11,784.48	\$11,784.48	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$235,689.58	\$235,689.58	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$3,061,400	

Design/NEPA (10%)	\$306,140.00
CM (10%)	\$306,140.00
Total	\$3,673,680.00

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT) - Concept 2 - Application Construction Estimate

Segment Name: Concept 2 - Around Bombproof Switch Station to AMD

Total Length = 1460 LF

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$351,044.31	\$351,044.31	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$29,253.69	\$29,253.69	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$87,190.14	\$87,190.14	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$29,063.38	\$29,063.38	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$58,507.38	\$58,507.38	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.8	ACRE	\$25,000.00	\$19,031.22	
20301.0000	REMOVALS	1.0	LS	\$20,000.00	\$20,000.00	Fence, Misc Concrete
20402.0000	EMBANKMENT CONSTRUCTION	12,567.4	CUYD	\$100.00	\$1,256,740.74	Assume 2' depth
25101.2000	PLACED RIPRAP, CLASS 2	10.0	CUYD	\$90.00	\$900.00	
25210.0000	ROCKERY / CAST IN PLACE	1,440.0	SQYD	\$100.00	\$144,000.00	
25501.0000	MECHANICALLY STABILIZED EARTH WALL	0.0	SQFT	\$150.00	\$0.00	
25501.0000	SOIL NAIL WALL	3,400.0	SQFT	\$350.00	\$1,190,000.00	Large cut wall along Navy and Richardson Field section
30802.2000	ROADWAY AGGREGATE, METHOD 2	485.5	TON	\$40.00	\$19,418.00	
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	356.9	TON	\$225.00	\$80,300.00	4-inch trail
61501.0000	CURB AND GUTTER	0.0	LF	\$100.00	\$0.00	
61501.0100	SIDEWALK CONCRETE	200.0	SQYD	\$200.00	\$40,000.00	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	16.0	SQYD	\$350.00	\$5,600.00	
60201.0600	18-INCH PIPE CULVERT	200.0	LNFT	\$250.00	\$50,000.00	
60210.0600	END SECTION FOR 18-INCH PIPE CULVERT	2.0	EACH	\$1,500.00	\$3,000.00	
60704.0000	CLEANING CULVERT IN PLACE	1.0	EACH	\$2,000.00	\$2,000.00	
61901.0000	FENCE, CHAINLINK	1,400.0	LNFT	\$50.00	\$70,000.00	
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	20.0	HOURL	\$85.00	\$1,700.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY BUCKET, 24-INCH WIDTH	20.0	HOURL	\$120.00	\$2,400.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	20.0	HOURL	\$155.00	\$3,100.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	20.0	HOURL	\$135.00	\$2,700.00	
62301.0000	GENERAL LABOR	20.0	HOURL	\$60.00	\$1,200.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	20.0	HOURL	\$120.00	\$2,400.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	20.0	HOURL	\$120.00	\$2,400.00	
62510.2000	SEEDING, HYDRAULIC METHOD	0.8	ACRE	\$600.00	\$456.75	
62515.2000	MULCHING, HYDRAULIC METHOD	0.8	ACRE	\$2,000.00	\$1,522.50	
63301.0000	SIGN SYSTEM	10.0	EACH	\$500.00	\$5,000.00	
63308.0000	OBJECT MARKER	30.0	EACH	\$50.00	\$1,500.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$14,626.85	\$14,626.85	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$292,536.92	\$292,536.92	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$3,797,600	

Design/NEPA (10%) \$379,760.00

CM (10%) \$379,760.00

Total \$4,557,120.00

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT) - Concept 3 - Application Construction Estimate

Segment Name: Concept 3 - Along Navy Admiral's Boathouse Property to AMD (Historic Alignment)

Total Length = 1300 LF

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$49,749.68	\$49,749.68	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$4,145.81	\$4,145.81	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$12,299.68	\$12,299.68	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$4,099.89	\$4,099.89	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$8,291.61	\$8,291.61	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.2	ACRE	\$25,000.00	\$4,591.37	
20301.0000	REMOVALS	1.0	LS	\$100,000.00	\$100,000.00	Fence, Pavement
20402.0000	EMBANKMENT CONSTRUCTION	814.8	CUYD	\$100.00	\$81,481.48	Assume 2' depth along trail and for embankment for Berm within boathouse parcel
25101.2000	PLACED RIPRAP, CLASS 2	10.0	CUYD	\$90.00	\$900.00	
25210.0000	ROCKERY / CAST IN PLACE	0.0	SQYD	\$100.00	\$0.00	
25501.0000	MECHANICALLY STABILIZED EARTH WALL	0.0	SQFT	\$150.00	\$0.00	Various segments as shown on plans
25501.0000	SOIL NAIL WALL	0.0	SQFT	\$350.00	\$0.00	Various segments as shown on plans
30802.2000	ROADWAY AGGREGATE, METHOD 2	166.3	TON	\$40.00	\$6,650.00	6-inch aggregate base
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	165.0	TON	\$225.00	\$37,125.00	4-inch asphalt trail - 10-ft wide, & parking lot reconfigurations
61501.0000	CURB AND GUTTER	175.0	LF	\$100.00	\$17,500.00	parking lot reconfigurations
61501.0100	SIDEWALK CONCRETE	0.0	SQYD	\$200.00	\$0.00	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	16.0	SQYD	\$350.00	\$5,600.00	
60201.0600	36-INCH PIPE CULVERT	60.0	LNFT	\$350.00	\$21,000.00	Extend existing near beginning of alignment
60210.0600	END SECTION FOR 36-INCH PIPE CULVERT	1.0	EACH	\$3,500.00	\$3,500.00	
60704.0000	CLEANING CULVERT IN PLACE	1.0	EACH	\$2,000.00	\$2,000.00	Clean large culvert at beginning of alignment
61901.0000	FENCE, CHAINLINK	1,000.0	LNFT	\$100.00	\$100,000.00	Through Boathouse, higher unit price for security elements (top chamfer and visual screen)
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	10.0	HOURL	\$85.00	\$850.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY BUCKET, 24-INCH WIDTH	10.0	HOURL	\$120.00	\$1,200.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	10.0	HOURL	\$155.00	\$1,550.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	10.0	HOURL	\$135.00	\$1,350.00	
62301.0000	GENERAL LABOR	20.0	HOURL	\$60.00	\$1,200.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	10.0	HOURL	\$120.00	\$1,200.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	20.0	HOURL	\$120.00	\$2,400.00	
62510.2000	SEEDING, SOD	0.2	ACRE	\$100,000.00	\$18,365.47	SOD and Landscape repairs on Boathouse Property
62515.2000	MULCHING, HYDRAULIC METHOD	0.2	ACRE	\$2,000.00	\$367.31	
63301.0000	SIGN SYSTEM	10.0	EACH	\$500.00	\$5,000.00	
63308.0000	OBJECT MARKER	15.0	EACH	\$50.00	\$750.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$2,072.90	\$2,072.90	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$41,458.06	\$41,458.06	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$546,700	

Design/NEPA (10%)	\$54,670.00
CM (10%)	\$54,670.00
Total	\$656,040.00

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT)- Application Construction Estimate

Segment Name: Richardson Road - HART to AMD

Total Length = 500 LF

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$65,724.93	\$65,724.93	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$5,477.08	\$5,477.08	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$16,293.49	\$16,293.49	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$5,431.16	\$5,431.16	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$10,954.16	\$10,954.16	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.2	ACRE	\$25,000.00	\$4,591.37	
20301.0000	REMOVALS	1.0	LS	\$25,000.00	\$25,000.00	Trees and pavement saw cutting/removal
20402.0000	EMBANKMENT CONSTRUCTION	1,777.8	CUYD	\$100.00	\$177,777.78	Assume 2' depth
25101.2000	PLACED RIPRAP, CLASS 2	10.0	CUYD	\$90.00	\$900.00	
25210.0000	ROCKERY / CAST IN PLACE	1,000.0	SQYD	\$100.00	\$100,000.00	Potential small wall for cut section into existing slope
25501.0000	MECHANICALLY STABILIZED EARTH WALL	0.0	SQFT	\$150.00	\$0.00	Various segments as shown on plans
25501.0000	SOIL NAIL WALL	0.0	SQFT	\$350.00	\$0.00	Various segments as shown on plans
30802.2000	ROADWAY AGGREGATE, METHOD 2	0.0	TON	\$40.00	\$0.00	
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	0.0	TON	\$225.00	\$0.00	4-inch trail
61501.0000	CURB AND GUTTER	500.0	LF	\$100.00	\$50,000.00	
61501.0100	SIDEWALK CONCRETE	555.6	SQYD	\$200.00	\$111,111.11	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	36.0	SQYD	\$350.00	\$12,600.00	
60201.0600	18-INCH PIPE CULVERT	200.0	LNFT	\$250.00	\$50,000.00	15 each @ 30-foot
60210.0600	END SECTION FOR 18-INCH PIPE CULVERT	2.0	EACH	\$1,500.00	\$3,000.00	
60704.0000	CLEANING CULVERT IN PLACE	1.0	EACH	\$2,000.00	\$2,000.00	
61901.0000	FENCE, CHAINLINK	0.0	LNFT	\$50.00	\$0.00	
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	10.0	HOURL	\$85.00	\$850.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY BUCKET, 24-INCH WIDTH	10.0	HOURL	\$120.00	\$1,200.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	10.0	HOURL	\$155.00	\$1,550.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	10.0	HOURL	\$135.00	\$1,350.00	
62301.0000	GENERAL LABOR	10.0	HOURL	\$60.00	\$600.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	10.0	HOURL	\$120.00	\$1,200.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	10.0	HOURL	\$120.00	\$1,200.00	
62510.2000	SEEDING, HYDRAULIC METHOD	0.2	ACRE	\$600.00	\$110.19	
62515.2000	MULCHING, HYDRAULIC METHOD	0.2	ACRE	\$2,000.00	\$367.31	
63301.0000	SIGN SYSTEM	4.0	EACH	\$500.00	\$2,000.00	
63308.0000	OBJECT MARKER	6.0	EACH	\$50.00	\$300.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$2,738.54	\$2,738.54	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$54,770.78	\$54,770.78	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$719,100	

Design/NEPA (10%)	\$71,910.00
CM (10%)	\$71,910.00
Total	\$862,920.00

Scoping Engineer's Cost Estimate

Project Name: Pearl Harbor Historic Trail (PHHT) - Application Construction Estimate

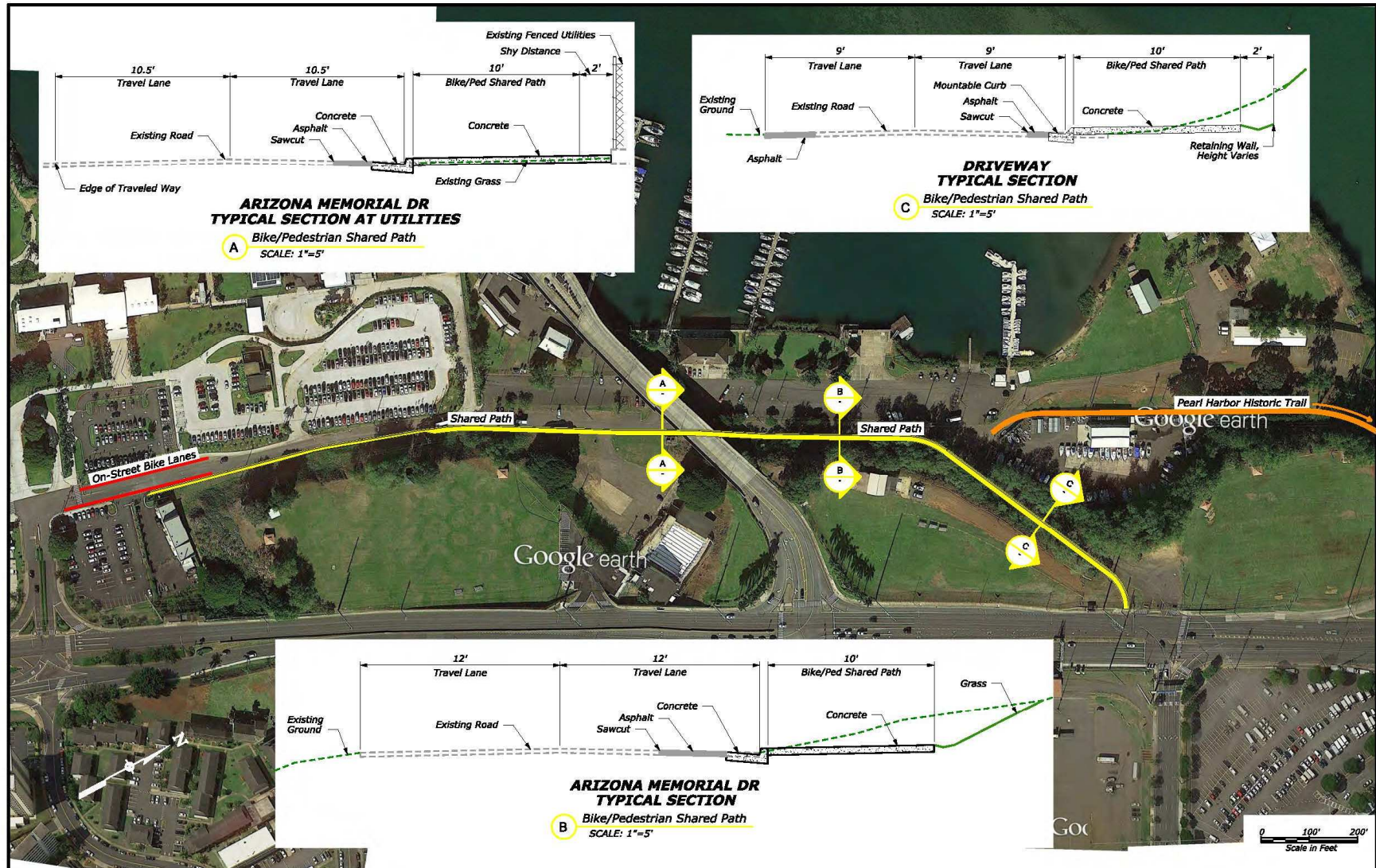
Segment Name: Arizona Memorial Drive

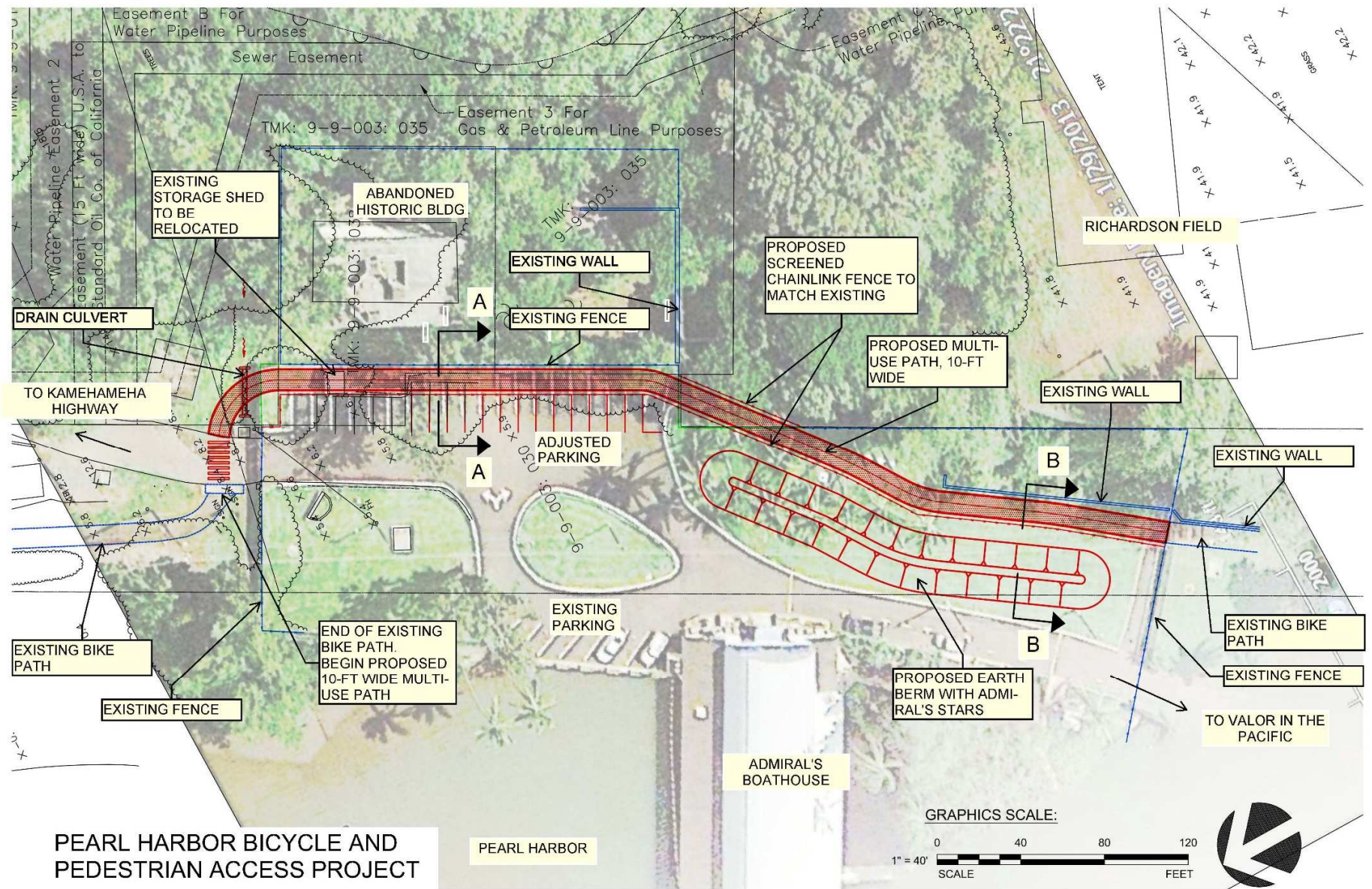
Total Length = 2200 LF

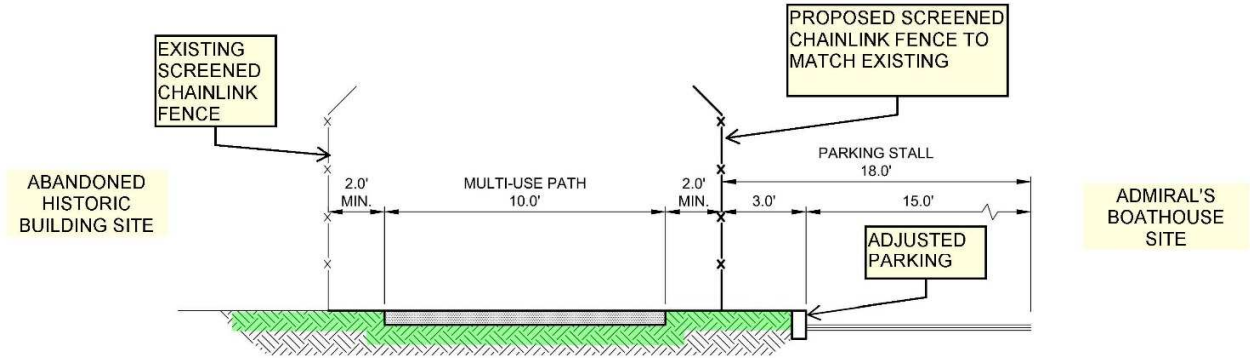
ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT	COMMENTS
15101.0000	MOBILIZATION	1.0	LPSM	\$114,649.22	\$114,649.22	12% of 201 thru 634 items
15201.0000	CONSTRUCTION SURVEY AND STAKING	1.0	LPSM	\$9,554.10	\$9,554.10	1% of 201 thru 634 items
15301.0000	CONTRACTOR QUALITY CONTROL	1.0	LPSM	\$28,390.27	\$28,390.27	3% of 201 thru 634 items
15401.0000	CONTRACTOR TESTING	1.0	LPSM	\$9,463.42	\$9,463.42	1% of 201 thru 634 items
15501.0000	CONSTRUCTION SCHEDULE	1.0	LPSM	\$5,000.00	\$5,000.00	
15701.0000	SOIL EROSION CONTROL	1.0	LPSM	\$19,108.20	\$19,108.20	2% of 201 thru 634 items
15802.0000	WATERING FOR DUST CONTROL	1.0	LPSM	\$5,000.00	\$5,000.00	
20102.0000	CLEARING AND GRUBBING	0.4	ACRE	\$25,000.00	\$9,067.95	
20301.0000	REMOVALS	1.0	LS	\$25,000.00	\$25,000.00	Trees and pavement saw cutting/removal
20402.0000	EMBANKMENT CONSTRUCTION	2,340.7	CUYD	\$100.00	\$234,074.07	Assume 2' depth
25101.2000	PLACED RIPRAP, CLASS 2	0.0	CUYD	\$90.00	\$0.00	
25210.0000	ROCKERY / CAST IN PLACE	1,680.0	SQYD	\$100.00	\$168,000.00	potential small wall along tall fill slope
25501.0000	MECHANICALLY STABILIZED EARTH WALL	0.0	SQFT	\$150.00	\$0.00	Various segments as shown on plans
25501.0000	SOIL NAIL WALL	0.0	SQFT	\$350.00	\$0.00	Various segments as shown on plans
30802.2000	ROADWAY AGGREGATE, METHOD 2	525.4	TON	\$40.00	\$21,014.00	
40301.0300	HOT ASPHALT CONCRETE PAVEMENT, GRADING C	0.0	TON	\$225.00	\$0.00	4-inch trail
61501.0000	CURB AND GUTTER	1,000.0	LF	\$100.00	\$100,000.00	
61501.0100	SIDEWALK CONCRETE	1,755.6	SQYD	\$200.00	\$351,111.11	
61504.0100	ACCESSIBILITY RAMP, CONCRETE	28.0	SQYD	\$350.00	\$9,800.00	
60201.0600	18-INCH PIPE CULVERT	0.0	LNFT	\$250.00	\$0.00	15 each @ 30-foot
60210.0600	END SECTION FOR 18-INCH PIPE CULVERT	0.0	EACH	\$1,500.00	\$0.00	
60704.0000	CLEANING CULVERT IN PLACE	0.0	EACH	\$2,000.00	\$0.00	
61901.0000	FENCE, CHAINLINK	200.0	LNFT	\$75.00	\$15,000.00	
62201.0200	DUMP TRUCK, 8 CUBIC YARD MINIMUM CAPACITY	20.0	HOURL	\$85.00	\$1,700.00	
62201.0550	BACKHOE LOADER, 6 CUBIC FOOT MINIMUM RATED CAPACITY	20.0	HOURL	\$120.00	\$2,400.00	
62201.0950	WHEEL LOADER, 3 CUBIC YARD MINIMUM RATED CAPACITY	20.0	HOURL	\$155.00	\$3,100.00	
62201.2850	MOTOR GRADER, 12 FOOT MINIMUM BLADE	20.0	HOURL	\$135.00	\$2,700.00	
62301.0000	GENERAL LABOR	20.0	HOURL	\$60.00	\$1,200.00	
62302.1000	SPECIAL LABOR, HIRED TECHNICAL SERVICES	20.0	HOURL	\$120.00	\$2,400.00	
62302.1100	SPECIAL LABOR, HIRED SURVEY SERVICES	20.0	HOURL	\$120.00	\$2,400.00	
62510.2000	SEEDING, HYDRAULIC METHOD	0.4	ACRE	\$600.00	\$217.63	
62515.2000	MULCHING, HYDRAULIC METHOD	0.4	ACRE	\$2,000.00	\$725.44	
63301.0000	SIGN SYSTEM	10.0	EACH	\$500.00	\$5,000.00	
63308.0000	OBJECT MARKER	10.0	EACH	\$50.00	\$500.00	
63501.0000	TEMPORARY TRAFFIC CONTROL	1.00	LPSM	\$4,777.05	\$4,777.05	0.5% of 201 thru 634 items
99920.0000	DESIGN CONTINGENCY	1.00	LPSM	\$95,541.02	\$95,541.02	15% of 201 thru 634 items
CONSTRUCTION TOTAL					\$1,246,900	

Design/NEPA (10%)	\$124,690.00
CM (10%)	\$124,690.00
Total	\$1,496,280.00

7.3 Appendix C. Recommended Concept Supporting Documentation





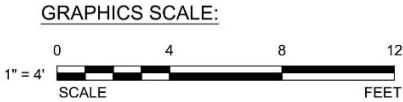


SECTION VIEW A-A

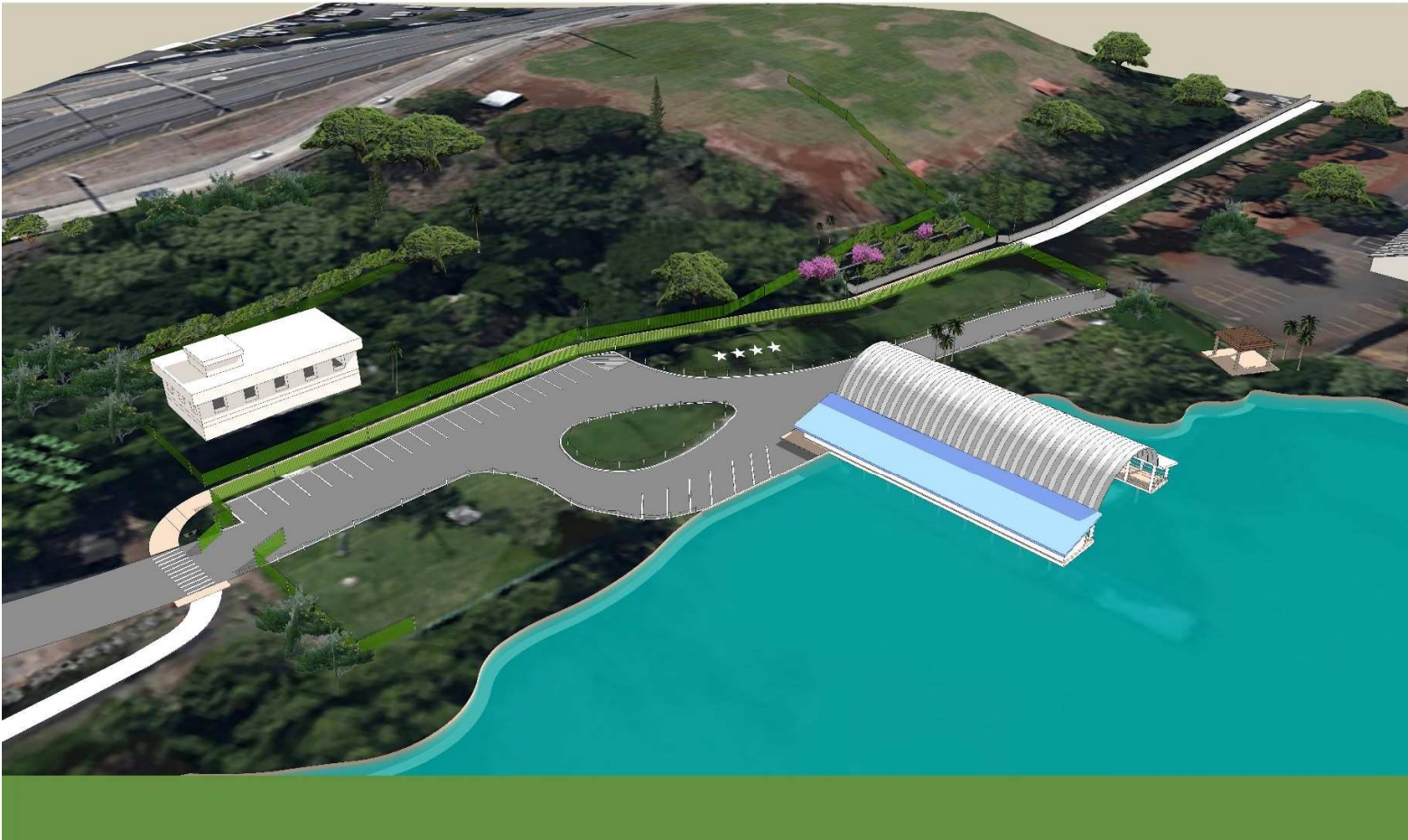


SECTION VIEW B-B

PEARL HARBOR BICYCLE AND
PEDESTRIAN ACCESS PROJECT



Pearl Harbor Historic Trail – Overview of Proposed Layout and Impact Mitigation



Pearl Harbor Historic Trail – Traversing Navy Boathouse Property



Pearl Harbor Historic Trail – Exiting Navy Boathouse Property and Gated Section



8. References

Halawa Area Transit-Oriented Development Plan, City and County of Honolulu, 2016.

Honolulu High Capacity Transit Corridor Project - Environmental Impact Statement (EIS) and Record of Decision (ROD), U.S. DOT, Federal Transit Administration (FTA), and City and County of Honolulu DTS, 2011.

O'ahu Bike Plan, City and County of Honolulu DTS, 2012.

Pearl Harbor Historic Trail (PHHT) Master Plan, City and County of Honolulu, 2003.