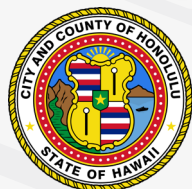


ALA WAI ALTERNATIVES ANALYSIS

APPENDIX G: ENVIRONMENTAL SETTING DESCRIPTION





ALA PONO, AN ALA WAI CROSSING

Environmental Setting, Potential Impacts, and Suggested Mitigation Measures

June 2019

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

Table of Contents

	Page
1 Executive Summary	1
2 Introduction.....	7
3 Project Timeline and Permit Requirements	9
Environmental Documentation.....	9
Permitting Requirements.....	10
4 Demographics, Social, and Environmental Justice.....	18
Population	19
Age Demographics.....	20
Households, Employment, and Income	21
Race/Ethnicity and Place of Birth Demographics.....	22
People With Disabilities	24
Potential Impacts and Suggested Mitigation Measures.....	24
5 Local Transportation Activity	29
Mode Shares and Trip Volumes.....	29
School Transportation Activity	32
Potential Impacts and Suggested Mitigation Measures.....	35
6 Transportation Infrastructure.....	38
Local Roads.....	38
Active Transportation Infrastructure	38
Parking.....	44
Potential Impacts and Suggested Mitigation Measures.....	49
7 Land Use	51
Existing land uses, along with zoning regulations provide important community context for considering the project alternatives.....	51
Parcel Ownership	51
Land Use and Zoning	52
Potential Impacts and Suggested Mitigation Measures.....	58
Visual Resources.....	60
Potential Impacts and Suggested Mitigation Measures.....	60
8 Public Services and Utilities	62
Emergency Services.....	62
Potential Impacts and Suggested Mitigation Measures (Emergency services).....	63
Public Services.....	65
Potential Impacts and Suggested Mitigation Measures (Public services).....	66
Utilities.....	66
Potential Impacts and Suggested Mitigation Measures (Utilities)	73
Planned Projects Near the Ala Wai Canal	75
Potential Impacts and Suggested Mitigation Measures (planned projects).....	76
9 Archaeological and Cultural Resources	78
Historic Properties.....	80
Archaeological Studies.....	81
10 Recreation.....	86
Recreation Activities	86
Recreation Facilities.....	87

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

11	Natural Resources	89
	Topography, Geology, and Associated Risks.....	89
	Water and Hydrology	93
	Biological Resources.....	97
	Air Quality	100
12	Natural Hazards and Climate Change	104
	Sea Level Rise.....	104
	Local Flooding	107
13	References	118
	Adjacent Planned Projects	123
	Key High Level Policies.....	124
	Key Images From Existing Plans.....	126

Appendix A Plan Review

Table of Figures

		Page
Figure 1	Ala Wai Canal Vicinity	2
Figure 2	Locations of Potential Alignments and Alternatives	8
Figure 3.	Anticipated Permits and Approvals	13
Figure 4	Ala Wai Community Park LWCF Boundary	16
Figure 5	Special Management Area.....	17
Figure 6	Ala Wai Canal Area Census Tracts	18
Figure 7	Population Forecasts, By Census Tracts (2014-2045).....	19
Figure 8	Age Distribution, By Census Tract (2016)	20
Figure 9	Household Statistics, By Census Tract (2016).....	21
Figure 10	Workforce and Unemployment, By Census Tract (2016).....	21
Figure 11	Family and Household Income Statistics, By Census Tract (2016).....	22
Figure 12	Race and Place of Birth, By Census Tract (2016)	23
Figure 13	People with Disabilities, By Census Tract (2016)	24
Figure 14	Travel Mode Share, By Census Tract (2015).....	30
Figure 15	Existing Bridge Travel Across Ala Wai Canal (2017, 2018).....	30
Figure 16	Existing Commutes In and Out of Waikīki	31
Figure 17	Possible New Active Transportation Commutes if Ala Pono is Aligned as a New Canal Crossing	32
Figure 18	Schools Within 2 Miles of the Ala Wai Canal.....	33
Figure 19	Map of Schools in the Vicinity of the Ala Wai Canal	34
Figure 20	Biki Bike Stations.....	40
Figure 21	Existing and Planned Bicycle Infrastructure	41
Figure 22	Existing Walk and Bike Shed	42
Figure 23	Potential Walk and Bike Shed with a New Crossing	43
Figure 24	Parking Inventory Map.....	46
Figure 25	Parking Utilization Map, Weekday 5:30 AM	47
Figure 26	Parking Utilization Map, Weekday 12:00 PM	47
Figure 27	Parking Utilization Map, Weekday 7:00 PM.....	47

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

Figure 28	Parking Utilization Map, Saturday 5:30 AM.....	48
Figure 29	Parking Utilization Map, Saturday 12:00 PM.....	48
Figure 30	Parking Utilization Map, Saturday 7:00 PM	48
Figure 31	Parcel Ownership in the Ala Wai Canal Area.....	51
Figure 32	Parcel Ownership Map	52
Figure 33	State Land Use Districts	55
Figure 34	Local Land Use Designations	56
Figure 35	Special Design Districts.....	57
Figure 36	Diagram of Local Panoramic Views.....	60
Figure 37	Emergency Service Centers	62
Figure 38	Detail Map of Utility Lines Around the Ala Wai Canal, Including Proposed Underground Electrical Cable Re-Alignment.....	70
Figure 39	Map of HECO Underground Cable Relocation Alignment, with Land Use Zoning....	71
Figure 40	Beachwalk Buffer Zone, Around Force Main 1	72
Figure 41	Planned Construction In and Around the Ala Wai Canal	77
Figure 42	Past Archaeological Research Around the Ala Wai Canal.....	82
Figure 43	Canal Area Archaeological Studies.....	83
Figure 44	Active and Regular Ala Wai Canal Events	86
Figure 45	Topography Around the Ala Wai Canal.....	90
Figure 46	Soils Map.....	91
Figure 47	Hawai'i Seismicity Map	93
Figure 48	Ala Wai Canal Water Quality Conditions.....	95
Figure 49	Bird Species Documented in the Ala Wai Canal Area	98
Figure 50	Federal/State-Protected Species of Fauna and Flora	99
Figure 51	Air Quality Standards Per Pollutant	102
Figure 52	Land Area Change Under 3.2 Feet of Sea Level Rise Conditions.....	105
Figure 53	Flood Zone Map	108
Figure 54	Definitions of Flood Zones Around the Ala Wai Canal.....	109
Figure 55	Rendering of 1% Annual Chance Exceedance Flood.....	110
Figure 56	1% Annual Chance Exceedance Flood Map, By Foot of Flooding	111
Figure 57	Disturbance Areas During 1% Annual Exceedance Flood	111
Figure 58	Tsunami Evacuation Zone Map.....	112
Figure 59	Pedestrian Evacuation Across Ala Wai Canal, No New Crossing	115
Figure 60	Pedestrian Evacuation Across Ala Wai Canal, With Proposed New Crossing at University Avenue	116
Figure 61	Pedestrian Evacuation Across Ala Wai Canal, With Proposed New Crossing at the Ala Wai Golf Course.....	117
Figure 62	Plans with Local Recommendations Related to the Ala Wai Canal.....	121
Figure 63	Planned Projects In and Around the Ala Wai Canal.....	124
Figure 64	Key Policies	125
Figure 65	Waikiki Pedestrian Network Gaps.....	126
Figure 66	Waikiki 3.2 Ft Sea Level Rise Forecast (2100 Planning Horizon).....	127
Figure 67	Documents Reviewed.....	127

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report
City and County of Honolulu

Cover Image Source: Google Earth, 2016

Prepared By: Honolulu Department of Transportation Services

Consultant Team: Nelson Nygaard Consulting Associates, in association with PBR HAWAII & Associates, and Austin, Tsutsumi & Associates

1 EXECUTIVE SUMMARY

This document describes existing environmental conditions in the Ala Pono project area, including surrounding land uses, regional context, and a description of related projects. Detailed physical site characteristics are provided, along with a review of planning contexts. It focuses on conditions that may be impacted, improved, or harmed by potential Ala Pono alignments. Data sources build off the three environmental setting efforts, recently completed as part of other capital projects planned in the Ala Wai Canal area:

- Hawaiian Electric Company (HECO): Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)¹
- US Army Corps of Engineers (USACE): Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)²
- State of Hawai'i, Department of Land and Natural Resources (DLNR): Ala Wai Canal Dredging and Improvements, Final Environmental Impact Statement (2018)³

The key findings and potential mitigations described in this report will serve as inputs for the environmental analysis conducted during the project design.

For the purpose of this study, the Ala Wai Canal area is defined by the 24 census tracts in the following map. In some sections however, the bounds of this study area vary based on the geography of specific data sources. The neighborhoods in the study area include Ala Moana and Mō'ili'ili on the mauka side of the canal, and Waikīkī on the makai side.

¹ http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-06-08-OA-FEA-Ala-Wai-46kV-Cable-Relocation.pdf

²

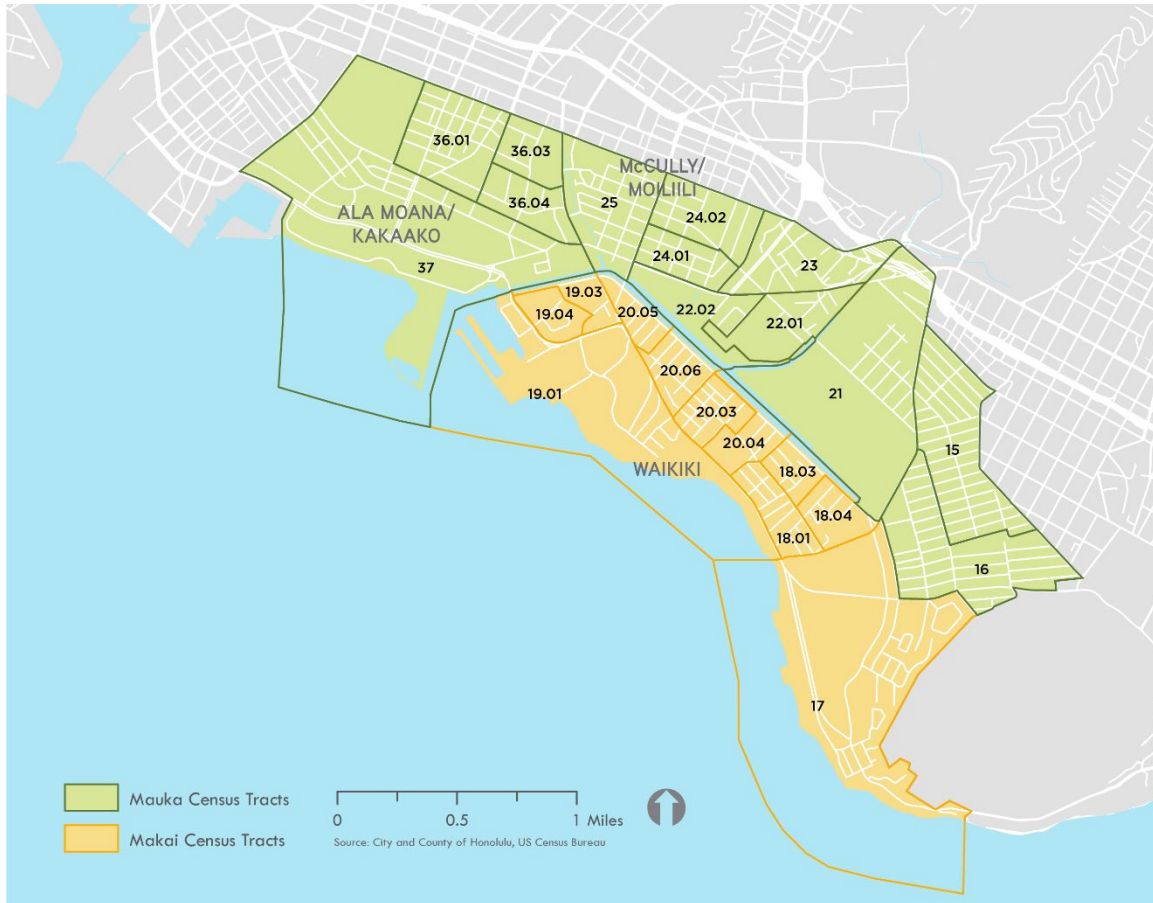
https://www.poh.usace.army.mil/Portals/10/docs/projectreviewplans/Ala%20Wai_FeasibilityReportEIS_FINAL.pdf?ver=2017-05-24-115820-123

³ http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2018-01-08-OA-FEIS-Ala-Wai-Canal-Dredging-and-Improvements.pdf

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

Figure 1 Ala Wai Canal Vicinity



Population Demographics

Key Findings

Over 70,000 people live in the 24 census tracts around the Ala Wai Canal (Figure 7), with approximately 70% residing on the mauka side of the canal, and 30% on the makai side.

- The canal area is estimated to gain 5,550 new residents by 2045 (Figure 7).
- Youth aged 19 and under are 13% of residents in Waikīkī, and 20% of those living across Ala Moana and Mō‘ili‘ili (Figure 8).
- On the makai side of the canal, approximately two out of five housing units are unoccupied (Figure 9). This could reflect the large number of second homes or vacation rental units in Waikīkī. Comparatively, the housing stock on the mauka side more closely reflects Honolulu’s occupancy ratio, with approximately nine out of ten housing units occupied.
- Approximately 41,715 people in the canal area are in the labor force, with over two-thirds residing on the mauka side of the canal (Figure 10).
- Unemployment is lower in the canal area than it is across Honolulu, with 5.1% unemployed in the county, 3.5% in Ala Moana and Mō‘ili‘ili, and 4.1% in Waikīkī (Figure 10).

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

- Median household incomes are 17%-29% lower in the Ala Wai Canal area than Honolulu's \$77,161 median household income (Figure 11).
- In Ala Moana and Mō'ili'ili, 8.8% of families have an income below the poverty level, a rate 2.7% higher than Honolulu (Figure 12).
- In Ala Moana and Mō'ili'ili, Asian residents make up 56% of the local population; this is 13% greater than their share of Honolulu residents (Figure 12).
- In Waikīkī, white residents make up 46% of the local population; this is more than double their share of Honolulu residents (Figure 12).
- Hawai'i-born residents are more than double (45%) their share of residents in Ala Moana and Mō'ili'ili, than in Waikīkī (19%).
- Residents born outside the United States are 31%-35% of the canal area population.
- In the Ala Wai Canal area, approximately 7,074 people are experiencing a disability. People experiencing a disability represent approximately one in ten Honolulu and canal area residents (Figure 13).

Local Transportation Activity

Key Findings

- Non-drive alone travel is more common among residents living around the Ala Wai Canal than in Honolulu overall, as 31% of canal residents travel by walking, bicycling, or riding transit today, compared to 22% in the county (Figure 14).
- Over 52,000 daily car and motorcycle trips crossing the Ala Wai Canal are within a 2 mile bikeshed of Waikīkī (Figure 15).
- If Ala Pono is aligned as a new crossing, it could expand the bikeshed around Waikīkī to enable approximately 3,000 more people to commute across the canal by walking or bicycling (Figure 17).
- There are 23 schools within 2 miles of the Ala Wai Canal (Figure 18). Ala Wai Elementary School and the 'Iolani School are the two schools closest to the Ala Wai Canal, and are in the immediate vicinity of proposed Ala Pono alignments.
- A new crossing could reduce overall vehicular traffic in the area by converting car and motorcycle trips in and around the Ala Wai Canal to biking and walking trips. The reduction of vehicular trips may also improve safety for biking and walking commutes.

Transportation Infrastructure

Key Findings

- A new or enhanced Ala Pono crossing can fill a gap between corridors on both sides of the canal with existing bike lanes and off-street paths.
- The O'ahu Bike Plan 2018 Update proposes a new canal crossing to fill one of these gaps with a bicycle path connecting Kālaïmoku Street and University Avenue – this is one of the proposed alignments for Ala Pono.
- As shown in Figure 22 and Figure 23, an estimated 18,000 more residents could gain access to Waikīkī within a 20-minute walk or bike ride, if a new crossing for walking and biking is built over the Ala Wai Canal.

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

- Biki bike stations also provide many easily accessible bikeshare locations throughout Waikīkī and the surrounding neighborhoods, as shown in Figure 20.
- The utilization of on-street parking within the study area already exceeds the City’s target, with many streets experiencing a rate higher than 85% while off-street facilities are under-utilized at 70%. Given this condition, a new Ala Pono crossing is unlikely to make a perceptible difference to nearby on-street parking demand. Any increase in demand for parking as a result of a new crossing is likely to be observed in off-street parking facilities, such as the Ala Wai Neighborhood Parking lot.
- Parking management strategies should be further studied as a separate effort to improve management of existing parking resources. A sample of parking management strategies that could be applied for improved turnover or resident access include:
 - Pricing existing parking supply
 - Resident Parking Permit program
 - Shared-Parking agreements with private lot operators
 - Transportation Demand Management services and infrastructure
 - Enhanced communication about parking availability
 - Shuttle services to the bridge head from remote parking
 - Wayfinding, signage, and information improvements

Land Use

Key Findings

- The Ala Wai Canal and much of the land adjacent to it are owned and operated by public agencies.
- The prospective Ala Pono alignments are all located within the Waikīkī Special District, per Honolulu zoning.
- The objectives defined for the Waikīkī Special District include supporting multi-modal transportation, emphasizing pedestrian orientation, and maintaining viewsheds where possible.
- The land surrounding the makai side of the proposed bridge alignment is within the City and County of Honolulu jurisdiction and thus land acquisitions are not anticipated.
- Scenic views play an integral role in sense of place around the Ala Wai Canal.

Public Services and Utilities

Key Findings

- Police and EMS calls for service by foot and bicycle have the potential to change based on alignment of Ala Pono. Emergency evacuation routes may also change based on the alignment of Ala Pono.
- The following utility lines are in the vicinity of the University Avenue/Kālainmoku Street and Kai’olu Street corridors (Figure 38): gas, sewer, water, drain, telecom, electric, and the proposed HECO cable realignment.

Ala Pono, an Ala Wai Crossing

DRAFT Environmental Setting, Potential Impacts and Suggested Mitigation Measures Report City and County of Honolulu

- HECO recommends in their underground cable relocation EIS that no structures be built above their new cable alignment, between the University Avenue/Kālainoku Street and Kai'olu Street corridors (Figure 38, Figure 39, and Figure 40). This alignment is beneath one of the proposed alignments for Ala Pono.

Archaeological and Cultural Resources

Key Findings

- There are two known historic sites with immediate proximity to the canal crossing project area, SIHP # 50-80-14-5796: An original wetland surface, and SIHP # 50-80-14-9757: The Ala Wai Canal itself.
- The Mānoa-Pālolo Canal, McCully Bridge and Kalākaua Bridge are eligible for inclusion in the National/State Register of Historic Properties.
- Figure 43 summarizes the DLNR's findings from five studies most pertinent to evaluating Ala Pono alignment due to their close proximity to the canal. Based on these studies, archaeological resources have been found within a 0.25-mile radius of the Ala Wai Canal, however not within the alignment of proposed crossing alternatives.

Recreation

Key Findings

- Local clubs and schools' canoe and kayak teams, including Interscholastic League of Honolulu (ILH) teams, regularly use the Ala Wai Canal as a practice and event venue.
- The Ala Wai Canal is a prominent venue for local paddling and kayaking clubs, as well as recreational sightseeing, walking, jogging, and biking (Figure 44).

Natural Resources

Key Findings

- Development of the Ala Pono crossing will not have any long-term impact on the area's topography or geology, which has already been highly modified since the completion of the Ala Wai Canal in the late 1920s. Construction will cause temporary soil disturbance, which can be restored to their original conditions after construction.
- The proposed crossing alignments are not within critical habitat. However, there are 24 federal- and state-protected species that potentially occur in the Ala Wai Watershed (Figure 50).
- There is potential for short-term negative water quality impacts in the Ala Wai Canal and Mānoa-Pālolo Drainage Canal during construction, however, significant long-term impacts to water quality and surrounding hydrology are not anticipated. There is also potential for runoff from the new crossing to enter the canal.

Natural Hazards and Climate Change

Key Findings

- Under the no new crossing scenario (Figure 59), all Waikīkī residents and employees would face a walk time of 45 minutes or longer to reach one of the safe sites on the mauka side of the canal, with approximately 21,500 people crossing the McCully Street bridge, and 13,900 people walking around the canal via Kapahulu Avenue.
- A new crossing at University Avenue (Figure 60) would enable 18,300 people to reach a safe site in less than 40 minutes and would reduce the number of people crossing at the McCully Street bridge by 60%.
- A new crossing at the Ala Wai Golf Course (Figure 61) would lessen walk times from central and eastern Waikīkī by five minutes each and reduce the number of people crossing at McCully and Kapahulu by 3,700-5,500 people respectively.
- While hurricane surge flooding is assumed to be minimal due to breakwaters and revetments at the Ala Wai Boat Harbor, the aging floodwalls have been cited as a high risk of local flooding; a condition USACE aims to rectify with its planned floodwall reconstruction project.
- Forecasts of sea level rise are projected to reach one foot of rise by 2050, and three feet by 2100, according to HECO's underground cable relocation environmental assessment and the analysis of the City and County's Climate Change Commission, which informed the mayor's Directive No. 18-01.
- Under the Mayor's Directive No. 18-01, Ala Pono should be planned and designed to remain functional through forecasted sea level rise of three to six feet, based on its intended service life.

2 INTRODUCTION

This document describes existing environmental conditions in the Ala Pono project area, including surrounding land uses, regional context, and a description of related projects. Detailed physical site characteristics are provided, along with a review of planning contexts. It focuses on conditions that may be impacted, improved, or harmed by potential Ala Pono alignments. Data sources build off the three environmental documentation efforts, recently completed as part of other capital projects planned in the Ala Wai Canal area:

- Hawaiian Electric Company (HECO): Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)⁴
- US Army Corps of Engineers (USACE): Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)⁵
- State of Hawai'i, Department of Land and Natural Resources (DLNR): Ala Wai Canal Dredging and Improvements, Final Environmental Impact Statement (2018)⁶

Over 20 existing plans, policies, and reports were reviewed to provide the policy foundation upon which this project is built. These documents set the stage for what is already planned and prioritized for, and around, the Ala Wai Canal. They were produced and/or adopted between 1971 and 2018, by the:

- City and County of Honolulu
- Oahu Metropolitan Planning Organization (OahuMPO)
- Hawai'i Department of Land And Natural Resources (DNLR)
- US Army Corps of Engineers (USACE)
- Hawaiian Electric Company (HECO)
- 'Iolani School

This plan review is in Appendix A.

The three alternatives evaluated in this document are:

- Create a New Crossing
- Enhance Existing Bridges
- Do Nothing

The alternative of creating a new crossing means construction of a bridge crossing for pedestrian and bicycle use. A new crossing is being considered at two locations. The first is an extension Kālaïmoku Street in Waikīkī to University Avenue. The second possible location is an extension of Seaside Avenue in Waikīkī to the Ala Wai Golf Course, and then across the outlet of Pālolo Stream to connect to the public multi-use path called the Ala Wai Park Trail that runs behind 'Iolani School and Ala Wai Elementary School (see Figure 2).

⁴ http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2017-06-08-OA-FEA-Ala-Wai-46kV-Cable-Relocation.pdf

⁵

https://www.poh.usace.army.mil/Portals/10/docs/projectreviewplans/Ala%20Wai_FeasibilityReportEIS_FINAL.pdf?ver=2017-05-24-115820-123

⁶ http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2018-01-08-OA-FEIS-Ala-Wai-Canal-Dredging-and-Improvements.pdf

3 PROJECT TIMELINE AND PERMIT REQUIREMENTS

Project permitting requirements and timeline will vary depending upon the scope and location of the selected alternative.

ENVIRONMENTAL DOCUMENTATION

Use of federal funds and/or need for a discretionary permit from a federal agency will necessitate compliance with the National Environmental Policy Act of 1970 (NEPA) (United States, Council on Environmental Quality). Use of state funds will trigger the need for compliance with Hawai'i's environmental documentation requirements consistent with Chapter 343, Hawai'i Revised Statutes.

National Environmental Protection Act & Related Authorities

Use of federal funds and/or need for a discretionary permit from a federal agency will necessitate compliance with the National Environmental Policy Act of 1969 (NEPA), the basic national charter for the protection of the environment (40 CFR Parts 1500-1508). When use of federal highways funds are the trigger for NEPA compliance, implementation is guided by 23 CFR Part 771. Section 771.115 (United States, Federal Highways Administration, Department of Transportation) describes classes of actions that prescribe the level of environmental documentation required for NEPA compliance.

NEPA compliance includes evaluation, consultation, and compliance with related authorities such as the National Historic Preservation Act ("Section 106"), the Endangered Species Act ("Section 7"), the Clean Water and Clean Air Acts, and for Federal Highways projects, 23 CFR 774 ("4f" of the Department of Transportation Act).

Actions that significantly affect the environment require an EIS. Examples of such actions include new construction of a freeway, rapid transit system, major rail lines, and highways of four or more lanes. Actions that are defined in 40 CFR 1508.4, and based on similar actions that do not involve significant impacts are documented with Categorical Exclusions, also known as CEs. These actions do not induce significant impacts to planned growth; do not require relocation of populations; do not have a significant impact on natural, cultural, recreational, historic, or other resource; do not significantly impact, air, water, or noise, do not have significant impacts on travel patterns or individually or cumulatively have significant environmental impacts. Notably, actions that normally might be categorized as a CE, but involve unusual circumstances may require additional study to determine if a CE is the appropriate level of environmental documentation. 24 CFR 771.117(b) list such unusual circumstances as:

- Significant environmental impacts
- Substantial controversy on environmental grounds
- Significant impact on properties protected by 4(f) requirements
- Significant impact on properties protected by Section 106 of the National Historic Preservation Act

- Inconsistencies with any Federal, State, or local law or administrative determination relating to the environmental aspects of the action

Additionally, 24 CFR 771.117(e) directs that bridges for which a bridge permit from the U.S. Coast Guard is needed, or does not meet the terms and conditions of if nationwide or general permits under section 404 of the Clean Water Act and/ Section 10 of the Rivers and Harbors Act may not be processed as a CE. Or, if a bridge triggers a finding of “adverse effect” to historic properties, or a use of a 4(f) property, or involves a finding of “may affect, likely to adversely affect” threatened and endangered species or critical habitat under the Endangered Species Act, it may not be processed as a CE.

The third class of action are Environmental Assessments (EAs). EAs are required for actions where there is not a clearly established significance necessitating an EIS, but exceeds the thresholds for consideration as a CE. All actions that are not an EIS or a CE are EAs (24 CFR 771.115(c)). If the preferred alternative is a new bridge, it is anticipated that the action will trigger the need for an Environmental Assessment to satisfy NEPA due to the need for a Coast Guard permit and, the likelihood of use of a 4(f) property (park) that is beyond *de minimus*. Other environmental factors discussed in this document upon further study, may also be grounds to evaluate the action with an Environmental Assessment. The proposed action does not appear to trigger the need for analysis under an EIS.

Hawai‘i Environmental Impact Statement Law (Chapter 343, HRS)

According to the HRS Chapter 343, the use of State and/or County lands and/or funds requires the preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS). Preparation of an EA or EIS falls in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR) pertaining to Environmental Impact Statements. HRS Section 343-5, established nine “triggers” that require either an EA or an EIS. When development is subject to HRS 343, it must be evaluated against Hawai‘i Administrative Rules Section 11-200-12, Significance Criteria. If the development will cause a significant impact pursuant to 11-200-12, it must be evaluated with an Environmental Impact Statement (EIS). If environmental impacts can be avoided or appropriately mitigated to achieve a Finding of No Significant Impact (FONSI), an Environmental Assessment may be prepared.

It is anticipated that an Environmental Assessment will be sufficient to disclose the environmental conditions and impacts (both beneficial and negative) for the project.

PERMITTING REQUIREMENTS

Anticipated entitlements include local, state, and federal permits as follow:

Federal Permits

- Coast Guard Permit (Section 9 of the Rivers and Harbors Act). Construction or modification of any bridge over navigable waters necessitates a Coast Guard Permit. The bridge permitting process (in brief) involves: project initiation through the Coast Guard District Bridge Office; coordination relating to NEPA lead agencies; preliminary navigational clearance; NEPA scoping; NEPA decision-making; and, public notice before a final decision is made (United States Coast Guard, Office of Bridge Programs, 2016)

- Army Corps Permit (Section 10 of the Rivers and Harbors Act). Section 10 of the Rivers and Harbors Act of 1899 requires approval from the Corps of Engineers for work in or over navigable waters of the United States. Commonly, Army Corps permits are required for dredge, fill, installation of piers, shoreline stabilization. Depending on design of the preferred alternative, an Army Corps permit may be required.
- Clean Water Act (Section 404) - In-water work that involves dredge or fill in the Ala Wai Canal may trigger the need for a Section 404 permit from the Army Corps of Engineers. An “individual” permit will be required for dredge or fill that create significant impacts, whereas a “Nationwide” permit (NWP) may be appropriate for more routine categories of actions. NWP 15 authorizes dredge or fill of material incidental to the construction of bridges, authorized by the U.S. Coast Guard under section 9 of the Rivers and Harbors Act; however NWP does not cover approach fills. Upon selection of a preferred alternative, the U.S. Army Corps Regulatory Branch (Honolulu District) should be consulted to confirm if a Section 404 permit is necessary. If no in-water work is proposed, this permitting process may be avoidable. The Army Corps of Engineers Honolulu District Regulatory Branch website offers helpful guidance in determining when individual Water Quality Certifications and Coastal Zone Management Act Concurrence are required:
 - Clean Water Act Water Quality Certification (Section 401) – Typically, a Water Quality Certification (WQC), is required for in-water work. In Hawai‘i, Water Quality Certifications are issued by the State Department of Health, Clean Water Branch. If the selected alternative includes in-water work, the Hawai‘i Department of Health, Clean Water Branch should be consulted to establish the need for a Water Quality Certification is required. If no in-water work is proposed, this permitting process may be avoidable.
 - Coastal Zone Consistency – The entire State of Hawai‘i is in the Coastal Zone, thus subject to the Coastal Zone Management Act (CZMA). Most federal actions in the Coastal Zone are subject to review for consistency with the CZMA. If a Coast Guard bridge permit is required, CZM federal consistency review is required. Permits through the Army Corps are separate actions for CZM reviews, therefore, it is possible that CZM consistency will also need to be sought for Corps permits. However, individual CZMA Concurrence is required for NWP#14 (linear transportation projects) where more than 200 lineal feet are impacted, however not required for bridges authorized under NWP#15 (United States Army Corps of Engineers, Honolulu District, 2019). If The State of Hawai‘i Office of Planning is the statewide lead for implementation of the CZMA and should be consulted upon determination of upon design (Nakagawa, 2019).
- Land and Water Conservation Fund (LWCF 6f) – Section 6(f)(3) of the Land and Water Conservation Fund Act protects federal investments in outdoor recreation facilities. If land used for public outdoor recreation was purchased or developed using LWCF funds, it may not be converted to uses other than public outdoor recreation uses (United States, National Parks Service, 2019). The boundary shown on Figure 4 indicates that the area of Ala Wai park that is protected forever for outdoor recreational use is limited to the ball fields and does not include the area mauka of the canal proposed for either of the Ala Pono crossing alternatives.

State of Hawai‘i

- Section 103-50, HRS (DCAB Review) – Section 103-50, HRS requires that all public facilities be designed to be accessible and usable to people with disabilities. The specific design standards shall conform to the 2004 Americans with Disabilities Act Accessibility Guidelines (2004 ADAAG) and the requirements of the Fair Housing Guidelines (FHAG) as adopted and amended by the Disability and Communication Access Board. Agencies of the state and counties are directed by Section 103-50 to seek the advice and recommendations from DCAB on all plans and specifications prior to commencing with construction to ensure conformance with the 2004 ADAAG and FHAG as well as any other design specifications that DCAB has adopted. Should a new bridge or bridge rehabilitation be the preferred alternative, DCAB should be consulted during the design phase of the project.
- State Historic Preservation Review (HRS 6-E) - The State of Hawai‘i recognizes the value of conserving and developing the historic and cultural property within the State for the public good. The State Historic Preservation Division (SHPD) reviews projects for impacts to historic properties in order to lessen or mitigate those impacts. The historic review process for Ala Pono will begin with initial consultation with SHPD to determine the need for historic review under HRS 6E. Initial consultation will be followed by an evaluation of significance and potential effects to historic properties, a plan for mitigation commitments, and finally a verification of the mitigation completion by SHPD.

City and County of Honolulu

- **Special Management Area (SMA)** – As described earlier, the entire State of Hawai‘i is within the Coastal Zone Management Areas (CZMA). Counties within the State of Hawai‘i are charged with implementation of some CZMA requirements, specifically, regulating activities and development in Special Management Areas (SMA). Honolulu’s SMA requirements are codified in Chapter 25, Revised Ordinances of Honolulu (ROH). Honolulu’s SMA boundary is shown in Figure 5. As it relates to the Ala Wai Canal, the SMA’s mauka boundary follows the centerline of Ala Moana Boulevard, crossing the canal and continues in the Diamond Head direction along Kālia Road, encompassing portions of the Royal Hawaiian Center, then extends along Kalākaua Boulevard, Koa Avenue, and follows Lemon Road to Kapahulu Avenue. Should the preferred alternative include modifications to the bridge at Ala Moana Boulevard, Special Management Area permit requirements may be triggered. Assuming any alterations to the bridge would exceed \$125,000 in value, the appropriate level of review would be a “SMA-Major”. Additionally under this scenario, the project Environmental Assessment (HRS 343) should address Chapter 25, Revised Ordinances of Honolulu relating to Special Management Area.
- **Special District Permit** – Portions of the Ala Wai Canal and adjacent land are within the Waikiki Special District and the Diamond Head Special District (see Figure 35). Special Districts as codified in Article 9, ROH are a means to guide development to protect or enhance physical or visual appearance in designated areas that have been deemed in need of restoration, preservation or redevelopment. Special District standards are supplemental to zoning district standards. Special District Permits are required for “major” or “minor” developments, as described in Section 21-9.20-2. “Major” developments are those that may significantly change the intended character of the

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

special district, and are subject to review by the district’s design advisory committee as specified in 21-2.40-2. “Minor” developments are those which will have limited impact. They are subject to review by the Planning Director. Exemptions to the Special District permit requirements are for development that have negligible or no impact, although emergency repairs can be exempt from permit requirements. Pre-consultation comments from the Department of Planning and Permitting indicate that a new bridge will be classified by the department as a major above-grade infrastructure improvement and requires a Special District Permit (Minor). The DPP pre-consultation response letter also notes the potential alignments within two Special Districts, and one alignment in a view corridor. These issues are discussed later in this report.

- **NPDES Permit** – A National Pollutants Discharge Elimination System (NPDES) establishes criteria intended to reduce the pollution associated with storm water runoff from new development and redevelopment. The Ala Pono crossing will likely fall under Priority B Projects, which are generally smaller projects with at least 10,000 square feet of impervious surface area and have the potential to discharge pollutants into the City’s drainage system.
- **Drainage Report** – Depending on the final design of the Ala Pono crossing, the City and County of Honolulu may require that the receiving body of water (Ala Wai Canal) be shown to have enough capacity to accept additional runoff generated from the project. Typically, this information is provided in a Drainage Report for the project.
- **Building Permits** – Building permits are administered by the Department of Planning and Permitting (DPP). The DPP serves as a coordinator of multiple departments and agencies to review construction plans.

Figure 3. Anticipated Permits and Approvals

Permit/Disclosure Type	Create a New Crossing	Enhance Existing Bridge(s)	Do Nothing	Phasing Timeline	Duration
FEDERAL					
NEPA & related authorities	Y – EA or CE	Y – CE	N	Design phase	9-12 months
Coast Guard Permit	Y	Y	N	Design phase; submit Project Initiation at outset of NEPA	Pre-consultation required to determine.
Army Corps Permit	Y, if in-water work	Y, if in-water work	N	Design phase	Pre-application consultation to determine if needed and duration

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

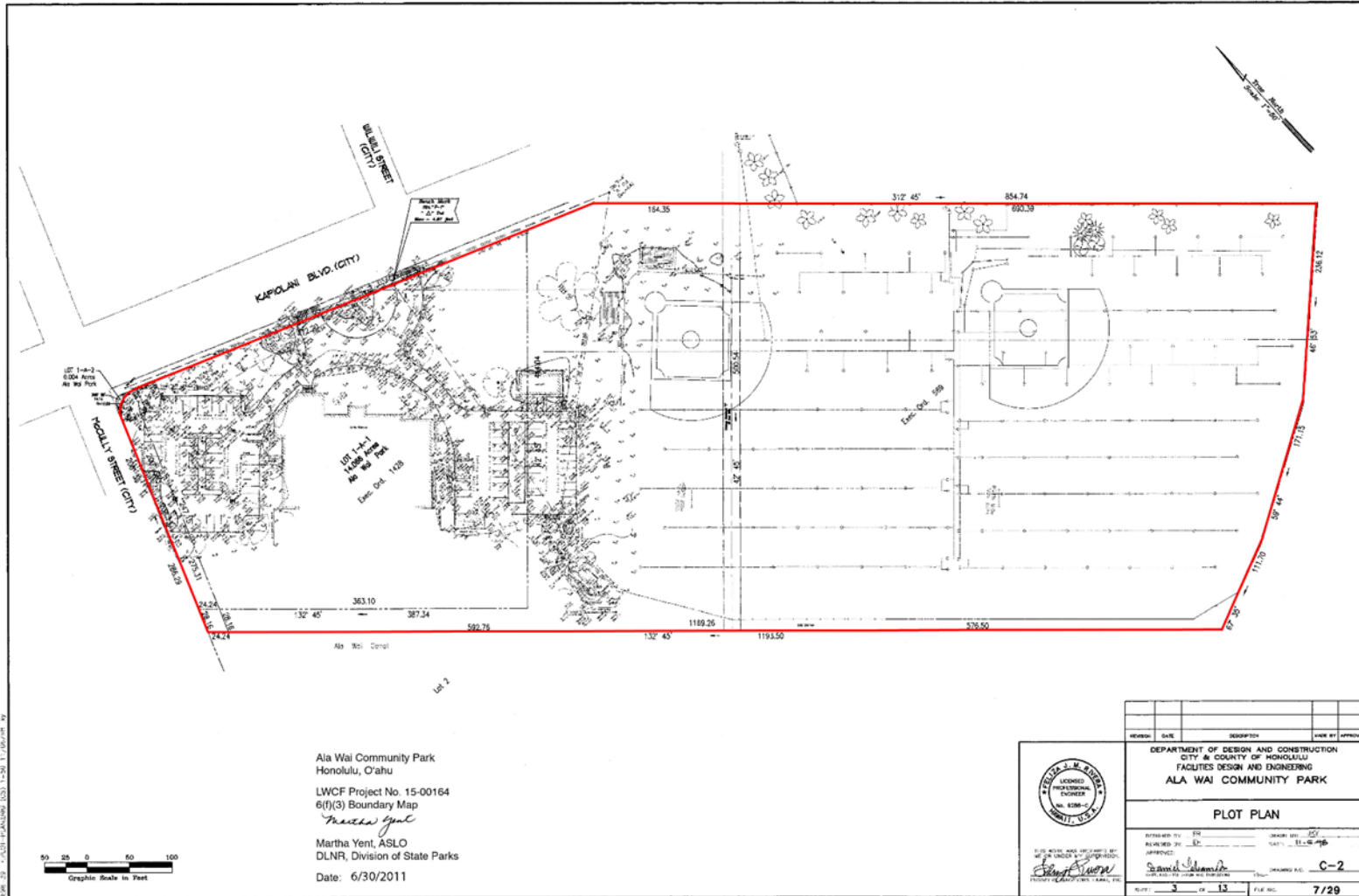
Permit/Disclosure Type	Create a New Crossing	Enhance Existing Bridge(s)	Do Nothing	Phasing Timeline	Duration
Water Quality Cert	Y, if in-water work	Y, if in-water work	N		Concurrent with Army Corps permit.
CZM Certification	Y, if Army Corps Individual Permit; N if NWP #15	Y, if Army Corps Individual Permit; N if NWP #15	N	Design phase; submit at least 90 days before federal approval of action	2-3 months
STATE OF HAWAII					
HRS 343	Y – EA	Y – EA likely	N	Design phase	8-12 months
DCAB Review	Y	Y	N	Design phase-consult; Construction phase-review	1 month
Historic Preservation Review (HRS 6-E)	Y	Y – initial consultation	N	Design phase (should accompany a permit)	4-6 months
CITY & COUNTY OF HONOLULU					
SMA	N - provided new crossing is mauka of Ala Moana Blvd.	Y – Minor if Ala Moana Bridge is enhanced	N	Design phase	5-6 months
Special District Permit	Y – Waikīkī and Diamond Head	Y (Waikīkī SD only) - Ala Moana & Kalākaua Bridges Y (Waikīkī and possibly	N	Design phase	1.5-3 months

Ala Pono, an Ala Wai Crossing | Environmental Setting
 City and County of Honolulu

Permit/Disclosure Type	Create a New Crossing	Enhance Existing Bridge(s)	Do Nothing	Phasing Timeline	Duration
		Diamond Head SDs) – McCully Bridge			
NPDES Permit	Y – (likely Priority B)	N	N	Design phase	2-3 months
Drainage Report	Y – if final design directs storm drainage from the crossing into the Ala Wai Canal	N	N	Design phase	4-6 months
Building Permits	Y	Y	N	Construction phase	At least 6 months

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 4 Ala Wai Community Park LWCF Boundary



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

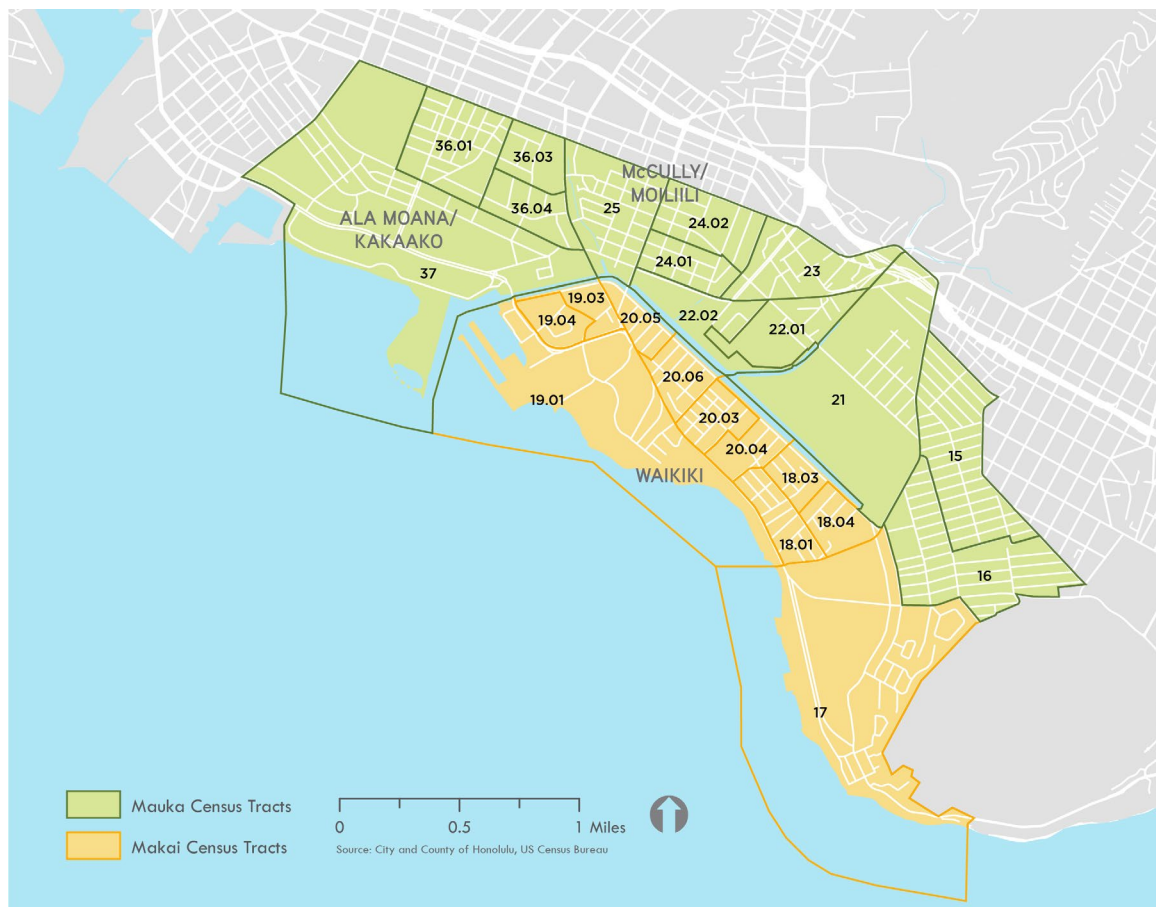
Figure 5 Special Management Area



4 DEMOGRAPHICS, SOCIAL, AND ENVIRONMENTAL JUSTICE

Environmental justice involves the evenhanded and meaningful involvement of all peoples, regardless of their race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies.⁷ A key component of understanding environmental justice is the anticipated social impacts of any given action. Therefore, demographic conditions in the Ala Wai Canal area are documented to assess the potential social and environmental justice impacts of the Ala Pono crossing alternatives, so that measures to minimize any potential negative consequences toward especially vulnerable groups can be anticipated. The data in this chapter builds off the HECO's Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment, published in 2017, which reported demographics for census tracts on the makai and mauka sides of some Ala Pono alignment alternatives.

Figure 6 Ala Wai Canal Area Census Tracts



⁷ <http://hidot.hawaii.gov/administration/ocr/title-vi-program/>

POPULATION

The purpose of Ala Pono is to provide additional access for people travelling by foot or by bicycle across the canal. Assessing current population demographics determines the base conditions the crossing can improve.

Over 70,000 people live in the 24 census tracts around the Ala Wai Canal (Figure 6, Figure 7). Seventy percent of these residents live on the mauka side of the canal. However, the large concentration of hotels and resorts on the makai side of the canal supports a higher daily population than Census records can capture. The net result of DBEDT’s annual growth forecasts from 2016 through 2045 is an 8% population increase, an estimated 5,550 new residents in the canal area.

Figure 7 provides 2016 population estimates, and forecasted future population based on the application of annual change rates published by the State Department of Business, Economic Development, and Tourism (DBEDT). The DBEDT regularly publishes long-range population change forecasts for the state. They estimate that Honolulu County’s population will experience the following annual growth rates through 2045:⁸

- 2016-2025: 0.4%
- 2025-2035: 0.3%
- 2035-2045: 0.1%

Figure 7 Population Forecasts, By Census Tracts (2014-2045)

Population	City and County of Honolulu	Waikiki ⁹	Ala Moana & Mō‘ili‘ili ¹⁰
		Makai Side of Canal	Mauka Side of Canal
2016 ACS Estimate ¹¹	986,999	21,236	49,168
2025 DBEDT Forecast	1,023,105	22,013	50,967
2035 DBEDT Forecast	1,054,216	22,682	52,516
2045 DBEDT Forecast	1,064,805	22,910	53,044

Sources: American Community Survey, 2016 five-year estimates, Table S0101; Population and Economic Projections for the State of Hawai‘i to 2045, DBEDT (2018)

⁸ Population and Economic Projections for the State of Hawai‘i to 2045 (2018)

⁹ Waikiki values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01

¹⁰ Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01

¹¹ The most current available population distributions by Census Tract are 2016; however, the US Census estimate for Honolulu has declined in 2017 and 2018

AGE DEMOGRAPHICS

Figure 8 displays the age distribution of the population in Honolulu and the canal area.

The close proximity of Ala Wai Elementary and the ‘Iolani School to proposed alignments for Ala Pono will necessitate engaging youth and parents in the analysis of crossing alternatives, to address the needs of students and parents traveling to these local schools. Youth, age 19 and under, are almost a quarter of Honolulu’s general population, however they are a smaller share of the people living in the canal area. Youth are 13% of residents in Waikīkī, and 20% of those living across Ala Moana and Mō‘ili‘ili.

Older adults, age 65 and up, are 16% of Honolulu residents. In the canal area, older adults make up a smaller but similar size subset of the population, as 15% of Waikīkī and 13% of Ala Moana and Mō‘ili‘ili residents.

Figure 8 Age Distribution, By Census Tract (2016)

Population	City and County of Honolulu	Waikīkī	Ala Moana & Mō‘ili‘ili
		Makai Side of Canal	Mauka Side of Canal
Total	986,999	21,236	49,168
Under 5 years	7%	3%	5%
Age 5-9	6%	2%	3%
Age 10-14	6%	2%	4%
Age 15-19	6%	6%	8%
Age 20-24	8%	9%	9%
Age 25-29	8%	9%	8%
Age 30-34	7%	7%	7%
Age 35-39	6%	8%	7%
Age 40-44	6%	8%	7%
Age 45-49	6%	8%	8%
Age 50-54	6%	8%	8%
Age 55-59	6%	7%	7%
Age 60-64	6%	7%	6%
Age 65-70	5%	5%	4%
Age 70-74	3%	3%	3%
Age 75-79	3%	3%	2%
Age 80-84	2%	2%	3%
Age 85+	3%	2%	1%

Notes: Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01. Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Source: American Community Survey, 2016 five-year estimates, Table S0101

HOUSEHOLDS, EMPLOYMENT, AND INCOME

Households

Figure 9 provides statistics on household size and occupation rates.

On the makai side, approximately two out of five housing units are unoccupied. This could reflect a large number of second homes or vacation rental units in Waikīkī. Comparatively, the housing stock on the mauka side of the canal more closely reflects Honolulu’s occupancy ratio, with approximately nine of ten housing units occupied.

The number of people per household is lower in the Ala Wai Canal area than Honolulu, with 1.7 people per household in Waikīkī, 2.2 people in Ala Moana and Mō‘ili‘ili, compared to 3.1 people across the county. The larger household size on the mauka side of the canal follows the larger population on the mauka side of the canal, compared to Waikīkī on the makai side.

Figure 9 Household Statistics, By Census Tract (2016)

Statistic	City and County of Honolulu	Waikīkī	Ala Moana & Mō‘ili‘ili
		Makai Side of Canal	Mauka Side of Canal
Average HH Size	3.1	1.7	2.2
Housing Units	342,982	20,462	26,590
Occupied Units	90%	58%	85%
Vacant Units	10%	42%	15%

Notes: Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01. Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Sources: American Community Survey, 2016 five-year estimates, Tables DP03, DP04, and S1101

Employment

Figure 10 presents workforce and unemployment statistics in the area of potential Ala Pono alignments.

Approximately 41,715 people in the canal area are in the labor force, with over two-thirds residing on the mauka side of the canal. The unemployment rate in Honolulu is approximately 5.1%. In the canal area, unemployment is 1-1.6% lower.

Figure 10 Workforce and Unemployment, By Census Tract (2016)

Statistic	City and County of Honolulu	Waikīkī	Ala Moana & Mō‘ili‘ili
		Makai Side of Canal	Mauka Side of Canal
Residents in Workforce	526,530	12,663	29,052
Unemployment Rate	5.1%	4.1%	3.5%

Notes: Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01. Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Source: American Community Survey, 2016 five-year estimates, Table DP03

People with Low Income

Figure 11 provides statistics on individuals with income below the poverty level by age group.

People with lower incomes are a key stakeholder group to engage in the evaluation of Ala Pono crossing alternatives. Median household incomes are 17%-29% lower in the Ala Wai Canal area than Honolulu's \$77,161 median household income. The median household income in Ala Moana and Mō'ili'ili is \$55,072, \$9,308 less than that of Waikīkī.

In Ala Moana and Mō'ili'ili, 8.8% of families have an income below the poverty level, a rate 2.7%-3.1% higher than Waikīkī and Honolulu. In the Ala Wai Canal area over 1,200 families have an income below the poverty level.

Figure 11 Family and Household Income Statistics, By Census Tract (2016)

Statistic	City and County of Honolulu	Waikīkī	
		Makai Side of Canal	Ala Moana & Mō'ili'ili Mauka Side of Canal
Median Household Income	\$77,161	\$64,380	\$55,072
Total Families	218,344	4,600	11,241
Percent of Families With Income Below the Poverty Level	6.1%	5.7%	8.8%

Notes: Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01. Ala Moana & Mō'ili'ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Source: American Community Survey, 2016 five-year estimates, Table S1701

RACE/ETHNICITY AND PLACE OF BIRTH DEMOGRAPHICS

Figure 12 presents the makeup of residents by proportions of race and ethnicity, as well as their place of birth.

In terms of race and ethnicity, white and Asian Americans are the two largest groups in the Ala Wai Canal area, comprising 75% or more of residents of the area. Ala Moana and Mō'ili'ili are more similar to Honolulu in their mix of race and ethnicity than is Waikīkī. On the makai side of the Ala Wai Canal, white residents make up more than double (46%) their share of countywide population (21%). On the mauka side, Asian residents make up 56% of the local population; this is 13% greater than their share of county residents.

Native Hawaiian and other Pacific Islander peoples represent 9% of Honolulu residents. Around the Ala Wai Canal, Native Hawaiian and Pacific Islander people are a smaller share of the population, making up 4%-8% of residents.

Hawai'i-born residents represent 45% of the residents in Ala Moana and Mō'ili'ili, compared to 19% in Waikīkī. Taken together, less than half the canal area residents (mauka and makai sides of the canal) are Hawai'i-born; conversely, 54% of Honolulu residents are Hawai'i-born.

In Waikīkī, 43% of residents were born in other states, which is 20% more than the share in Honolulu overall. Residents born outside the United States are 31%-35% of the canal area population.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

HECO’s environmental impact statement (EIS) found that their underground cable relocation project area was not an area with distinctively high racial minority populations compared to the City and County as a whole.¹² The USACE’s floodwall EIS, with a wider project area, including the entire Ala Wai flood basin, reflects this as well.¹³ Based on the data in Figure 12, and these recent findings encompassing the area of the proposed canal crossings, this project is not located in an area with distinctively high racial minority populations.

Figure 12 Race and Place of Birth, By Census Tract (2016)

Population	City and County of Honolulu	Waikīkī	
		Makai Side of Canal	Ala Moana & Mō‘ili‘ili
Total	986,999	21,236	49,168
Race/Ethnicity			
White	21%	46%	19%
Black or African American	2%	2%	1%
American Indian and Alaska Native	0%	0%	0%
Asian	43%	36%	56%
Native Hawaiian or Other Pacific Islander	9%	4%	8%
Other Race	1%	2%	1%
Two or more races	23%	10%	15%
Place of Birth			
Hawai‘i	54%	19%	45%
Other State	23%	43%	21%
Native, Born outside of USA	4%	4%	3%
Foreign Born	19%	35%	31%

Notes: Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01. Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Sources: American Community Survey, 2016 five-year estimates, Tables B03002 and B06003

¹² Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

¹³ Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

PEOPLE WITH DISABILITIES

Figure 13 shows shares of the Honolulu and Ala Wai Canal area populations who are people experiencing disabilities.

With approximately one in ten Honolulu and canal area residents experiencing a disability, they represent a significant stakeholder group that should be engaged through analysis of proposed canal crossing alignments.

Approximately 7,074 people living in the Ala Wai Canal area experience a disability. The shares of residents in Ala Moana and Mō‘ili‘ili, and in Waikīkī, are less than Honolulu, but within a 1% margin of difference.

Figure 13 People with Disabilities, By Census Tract (2016)

Population	City and County of Honolulu	Waikīkī ¹⁴	Ala Moana & Mō‘ili‘ili ¹⁵
		Makai Side of Canal	Mauka Side of Canal
Total Civilian Non-Institutionalized Population	939,337	20,826	48,874
Percent of People Experiencing a Disability	11%	10.5%	10%

Source: American Community Survey, 2016 five-year estimates, Table DP02

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

DBEDT forecasts a growing population along the Ala Wai Canal. Ala Pono should serve the growing number of people that live and work in the vicinity with an alignment that increases safety and convenience for the most people (Figure 7). Over 70,000 people live in the 24 census tracts around the Ala Wai Canal, and the local population is estimated to gain 5,550 new residents by 2045. The sections below present potential impacts and suggested mitigation measures segregated by the alternative types considered.

Create a New Crossing

Potential social, cultural and environmental justice-related impacts resulting from a new crossing generally relate to the creation of new linkages between a residential and commercial community mauka (Mō‘ili‘ili/McCully) and a visitor-oriented community makai (Waikīkī).

Kālainokū-University Alignment

With respect to a Kālainokū-University alignment, the greatest impacts on the mauka side could be expected to affect adjacent and proximate properties and uses, including the Ala Wai Park and Ala Wai Park Trail, Ala Wai Elementary School, the Ala Wai Community Gardens, the Ala Wai Canoe Shed and launch area, and the 500 University Avenue and Ala Wai cove condominium

¹⁴ Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01

¹⁵ Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01

developments. However, certain impacts could be felt in a broader area extending into the surrounding residential community.

Impacts of facilitating visitor access to mauka areas could include:

- Individually marketed visitor rental units (VRUs) - On the makai side, approximately two out of five housing units are unoccupied (Figure 9). This could reflect a large number of second homes or vacation rental units in Waikīkī. Comparatively, the housing stock on the mauka side of the canal more closely reflects Honolulu’s occupancy ratio, with approximately nine out of ten housing units occupied.

Whether legal or not, enhanced non-vehicle access to Waikīkī may encourage some mauka area condominium owners to market their homes as VRUs for parts or all of each year. This may be especially appealing where units were held as investments and rented long-term. The opportunity for shorter-term/higher yielding rentals could displace some primary residents from the mauka community and also create higher residential resale values, which will in turn lead to higher real property taxes for all owners in the area.

- Commercial interest and nuisance- The introduction of visitors or transients to the mauka areas may tend to generate interest in commercial uses and pressures to entitle such uses, and/or to spur unentitled enterprises. In turn, commercial activity, including VRU uses, could lead to increased nighttime noise and other nuisance factors in the neighborhood.
- Public safety – Increased foot and bicycle traffic alongside or through the public/social areas such as the Ala Wai Park, the Community Gardens and the Canoe Shed could expose these areas to greater risks of vandalism, theft and other petty crimes.
- Public facilities – Increased utilization of restroom and other facilities at Ala Wai Park will likely require additional repairs, maintenance and security, and may also suggest some initial new capital expenditures.
- Mobility – Greater ease of non-vehicular access from Waikīkī could also result in:
 - Easier access to UH Mānoa by students living in Waikīkī-based dormitories, and
 - More homeless persons or unsheltered youth seeking refuge in the mauka area parks, gardens, private plazas or streets and sidewalks.
- Recreational/cultural impacts – It is unclear how the “landing” at or near the Canoe Shed would be handled and if there would be some loss of area or functionality for this cultural/recreational land use. On the other hand, the opportunity to observe Hawaiian canoe practices by local residents could provide cultural enrichment for visitors.
- Economic impacts - Ala Pono could affect public interests and the area economy as follows:
 - More housing unit demand and higher property values in the mauka areas, as a result of VRU usage and potential displacement of primary residences from the community.
 - Increase in transient populations and/or retiree or second home owners in the mauka residential areas.
 - Increased desirability of existing UH dormitory uses in Waikīkī.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

- New employment during the construction of Ala Pono and to the extent authorized by government, new operational employment related to needs for additional public safety, repairs, maintenance and the like.
- Additional personal income related to the above employment factors.
- Fiscal impacts – Related to its economic impacts, Ala Pono could affect County government finances as follows:
 - Capital expenditures related to Ala Pono itself (direct), as well as for potentially needed support facilities such as additional rest facilities in Ala Wai Park, expansion of bike networks, etc.
 - Additional direct and indirect operating expenses in the operations of Ala Pono and any new support facilities.
 - Net additional real property and other tax revenues as may be generated by higher property values, population movements, and different uses in the region.

For State government, fiscal impacts may be expected to include:

- Gross excise tax from construction expenditures, income taxes from additional tax from construction and operational employment.

Impacts of facilitating pedestrian and bicycle access to Waikīkī could generally have positive impacts on environmental justice considerations for canal area residents:

- Employment and income access – Approximately 41,715 people in the canal area are in the labor force, with over two-thirds residing on the mauka side of the canal (Figure 10). While unemployment is already lower in the canal area than it is across Honolulu, with 5.1% unemployed in the county, 3.5% in Ala Moana and Mō‘ili‘ili, and 4.1% in Waikīkī, median household incomes are 17%-29% lower in the Ala Wai Canal area than Honolulu’s \$77,161 median household income (Figure 11). In Ala Moana and Mō‘ili‘ili, 8.8% of families have an income below the poverty level, a rate 2.7% higher than Honolulu.

The proposed crossing could further improve access by those living immediately mauka of the canal and without benefit of vehicular access to the numerous employment and income opportunities of Waikīkī.

- Recreational and cultural access – Easier access to beaches, parks and other recreational and cultural offerings of Waikīkī for Canal Area residents.
- Commercial access – Potentially more patronage of commercial establishments in Waikīkī.

Suggested mitigation measures for those impacts with potential social, cultural or environmental justice outcomes of concern include:

- ➔ Continue to engage with Ala Wai Elementary and the ‘Iolani School. The proposed alignment for Ala Pono will necessitate engaging youth and parents in the design of a crossing to address the needs of students and parents traveling to these schools. Youth are 13% of residents in Waikīkī, and 20% of those living across Ala Moana and Mō‘ili‘ili (Figure 8). Additionally, many of ‘Iolani School’s students and faculty and staff do not live in the area but could be impacted.

- Engage with people with lower incomes and those experiencing a disability as well as DCAB in the design of a crossing.
- Regarding the construction period, consultation with and notification of area residents, park users, gardeners and schools should be undertaken. Construction activities should be timed to avoid periods of most sensitive impact, so as to minimize disruption of living conditions, classroom and after school functions, and recreational and cultural pursuits.
- Measures to protect the primary residential nature of the mauka areas of the canal, including means of enforcing existing zoning regulations, should be considered in interests of preserving community values, housing affordability, noise control, and safety. Discussions might also consider whether the crossing should be open at all hours, or closed during some period of the night.
- The need for increased budgeting for repairs, maintenance, security and policing of public and private spaces potentially impacted by the additional multimodal traffic through the crossing area and its vicinity should be evaluated. There may also be need for initial capital expenditures to improve area public facilities in advance of the project's implementation, such as expansion or new or enlarged rest facilities, viewing areas, or relocation of Canoe Shed facilities.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Moving the crossing to the Seaside-Ala Wai Golf Course-Ala Wai Park Trail Alignment route is seen to have very similar impacts as the Kālaaimoku-University alignment, except that it may be utilized less due to its longer and more indirect route. Additionally, since this route would “land” on the mauka side farther from public roads and approach the Ala Wai Golf Course:

- It could create more negative impacts and potential nuisance travel through ‘Iolani School, the Community Gardens and Ala Wai Elementary as bicyclists and pedestrians seek to link to roads leading elsewhere in Mō‘ili‘ili/McCully.
- It could potentially create safety hazards for pedestrians and bicyclists in relationship to play on nearby holes of the Ala Wai Golf Course.

Suggested mitigation measures for this alternate alignment include:

- Continue to engage with Ala Wai Elementary and the ‘Iolani School. The proposed alignment for Ala Pono will necessitate engaging youth and parents in the design of a crossing to address the needs of students and parents traveling to these schools. Youth are 13% of residents in Waikīkī, and 20% of those living across Ala Moana and Mō‘ili‘ili (Figure 8). Additionally, many of ‘Iolani School’s students and faculty and staff do not live in the area but could be impacted.
- Engage with people with lower incomes and those experiencing a disability as well as DCAB in the design of a crossing.
- Regarding the construction period, consultation with and notification of area residents, park users, gardeners and schools should be undertaken. Construction activities should be timed to avoid periods of most sensitive impact, so as to minimize disruption of living conditions, classroom and after school functions, and recreational and cultural pursuits.
- Special attention should be paid to the alignment of the initial route, and to security and safety regarding its adjacency to the Ala Wai Golf Course.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, the potential social and environmental impacts related to increased visitor access to Mō‘ili‘ili/McCully would be less of a concern, but the various positive attributes of enhanced access to Waikīkī for residents of the mauka area would also be less likely to be realized. Enhanced multimodal access and safety on the bridges could be expected to have some effect, but far less than would the pedestrian/bicycle access at a new crossing location.

Suggested mitigation measures could include:

- Increased and improved measures for encouraging and guarding the safety of those who choose to cross the canal alongside the existing, high-traffic routes should be considered along with those of other planned multi-modal improvements in the vicinity.

Do Nothing

Should the alternative of no change be selected, potential impacts, both positive and negative, would be expected to be limited even more than under the “Enhance Existing Bridges” option, since multimodal traffic between Waikīkī and the Canal Area mauka of it would continue to be effectively discouraged.

5 LOCAL TRANSPORTATION ACTIVITY

To best improve local transportation activity with an Ala Pono crossing project, it is important to take stock of people’s current transportation activities in the canal area. This section describes mode shares, travel on existing Ala Wai Canal crossings, and school transportation activity.

MODE SHARES AND TRIP VOLUMES

In the Ala Wai Canal area, 31% of residents travel by walking, bicycling, or riding transit, making the average resident in the canal area more likely to travel by active transportation or public transit than the average Honolulu resident (Figure 14). According to travel mode shares reported by the Oahu Metropolitan Planning Organization (OahuMPO), 19% of canal area residents travel by walking or bicycling; a rate 8% higher than that of Honolulu.

Over 52,000 daily car and motorcycle trips crossing the Ala Wai Canal are within a 2-mile bikeshed¹⁶ of Waikīkī (Figure 15). Airsage anonymous location data from mobile devices reports that these trips make up 17%-30% of the daily trips on each road crossing the canal today. On a typical day, over 260,000 trips are made across the canal; approximately 14,000 of these trips are walking and bicycling trips today. Based on 24-hour count data recorded on road segments around the canal (Figure 15), daily trips crossing around the canal on Kapahulu Avenue are currently the most likely to be on foot or bicycle, compared to the three bridges at the western end of the canal.

Figure 16 maps commutes in and out of Waikīkī, according to 2015 U.S. Census Longitudinal Employer-Household Dynamics (LEHD) data. Approximately 38,000 commute trips start or end on the makai side of the Ala Wai Canal. With existing canal crossings, 18% of these commutes are within a reasonable walking or bicycling distance of Waikīkī. If Ala Pono is aligned as a new crossing, it could expand the bikeshed around Waikīkī to enable approximately 3,000 more people to commute across the canal by walking or bicycling (Figure 17).

¹⁶ A bikeshed or a walkshed is an access shed “defined as the area around a focal point to which a person would reasonably travel” by bicycling or walking. In this context, references to the “bikeshed” or “2-mile bikeshed of Waikīkī” refer to the area that is within a 2-mile bicycle ride of a central point in Waikīkī, using existing road non-motorized pathway networks. Similarly, references to the “walkshed” refer to the area that is within a 1-mile walk of a central point in Waikīkī, using sidewalks and pedestrian pathway networks. Figure 17, Figure 22, and Figure 23 illustrate the existing Waikīkī walkshed and bikeshed, as well as the area these access sheds could expand to with a new canal crossing. For more on bike and walk access sheds, see Section 2 of FTA Report No.0111 (2017):

<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf>

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 14 Travel Mode Share, By Census Tract (2015)

Mode	City and County of Honolulu	Waikīkī ¹⁷	Ala Moana & Mō‘ili‘ili ¹⁸
		Makai Side of Canal	Mauka Side of Canal
Auto	77%	69%	69%
Transit	11%	13%	12%
Walk or Bicycle	11%	19%	19%

Notes: Data reflects all trip types.

Source: OahuMPO Travel Demand Model (2015)

Figure 15 Existing Bridge Travel Across Ala Wai Canal (2017, 2018)

Statistic	McCully St Bridge	Kalākaua Ave Bridge	Ala Moana Blvd Bridge	Kapahulu Ave access around the canal (no bridge)
Average Daily Trips	75,000	74,000	75,000	39,000
Percent of Daily Trips By Bike / Walking	4%	5%	6%	7%
Percent of Daily Trips By Car / Motorcycle	96%	95%	94%	93%
Percent of Trips Within 2 Mile Bikeshed of Waikīkī	19%	23%	17%	30%
Car / Motorcycle Trips Within 2 Mile Bikeshed of Waikīkī	13,000	16,500	12,000	11,000

Note: Data reflects all trip types.

Sources: 24-hour count data recorded on road segments around the canal (September 2018); Airsage data (2017)

¹⁷ Waikīkī values are based on census tracts 20.04, 20.06, 19.03, 18.03, 20.03, 18.01, 18.04, 19.04, 17, 20.05, and 19.01.

¹⁸ Ala Moana & Mō‘ili‘ili values are based on census tracts 36.03, 36.04, 22.01, 24.02, 24.01, 37, 21, 22.02, 15, 23, 16, 25, and 36.01.

Ala Pono, an Ala Wai Crossing | Environmental Setting
 City and County of Honolulu

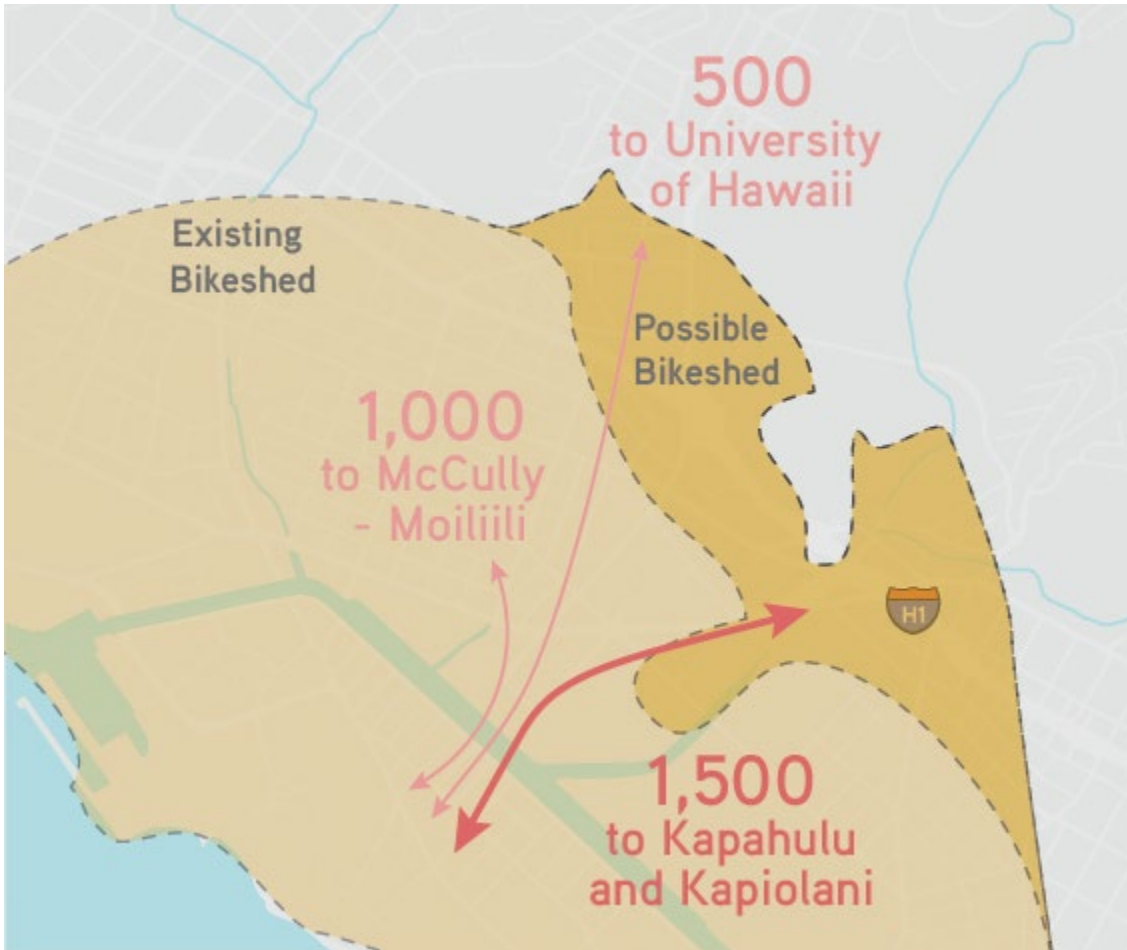
Figure 16 Existing Commutes In and Out of Waikiki



Note: Data reflects commute trips.

Sources: LEHD LODES (2015)

Figure 17 Possible New Active Transportation Commutes if Ala Pono is Aligned as a New Canal Crossing



Note: Data reflects commute trips.

Source: LEHD LODS 2015

SCHOOL TRANSPORTATION ACTIVITY

There are 23 schools within 2 miles of the Ala Wai Canal (Figure 18). Student travel is therefore a significant source of travel demand in the neighborhoods surrounding the canal. Figure 19 shows public school district boundaries in the canal area.

The two schools closest to the canal are Ala Wai Elementary School and the 'Iolani School. There are approximately 2,300 students in grades K-12, between these two schools.

Vehicle access to Ala Wai Elementary School, where approximately 430 students K-5 are enrolled, is by Hihiwai Street. The southeast end of Hihiwai Street at Lā'au Place is the primary pick-up/exit location for the 'Iolani lower campus (grades K-6), where enrollment is approximately 540 students. 'Iolani upper campus (grades 7-12) pick-up and drop off is on Kamoku Street side of the 'Iolani School upper campus parking lot.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 18 Schools Within 2 Miles of the Ala Wai Canal

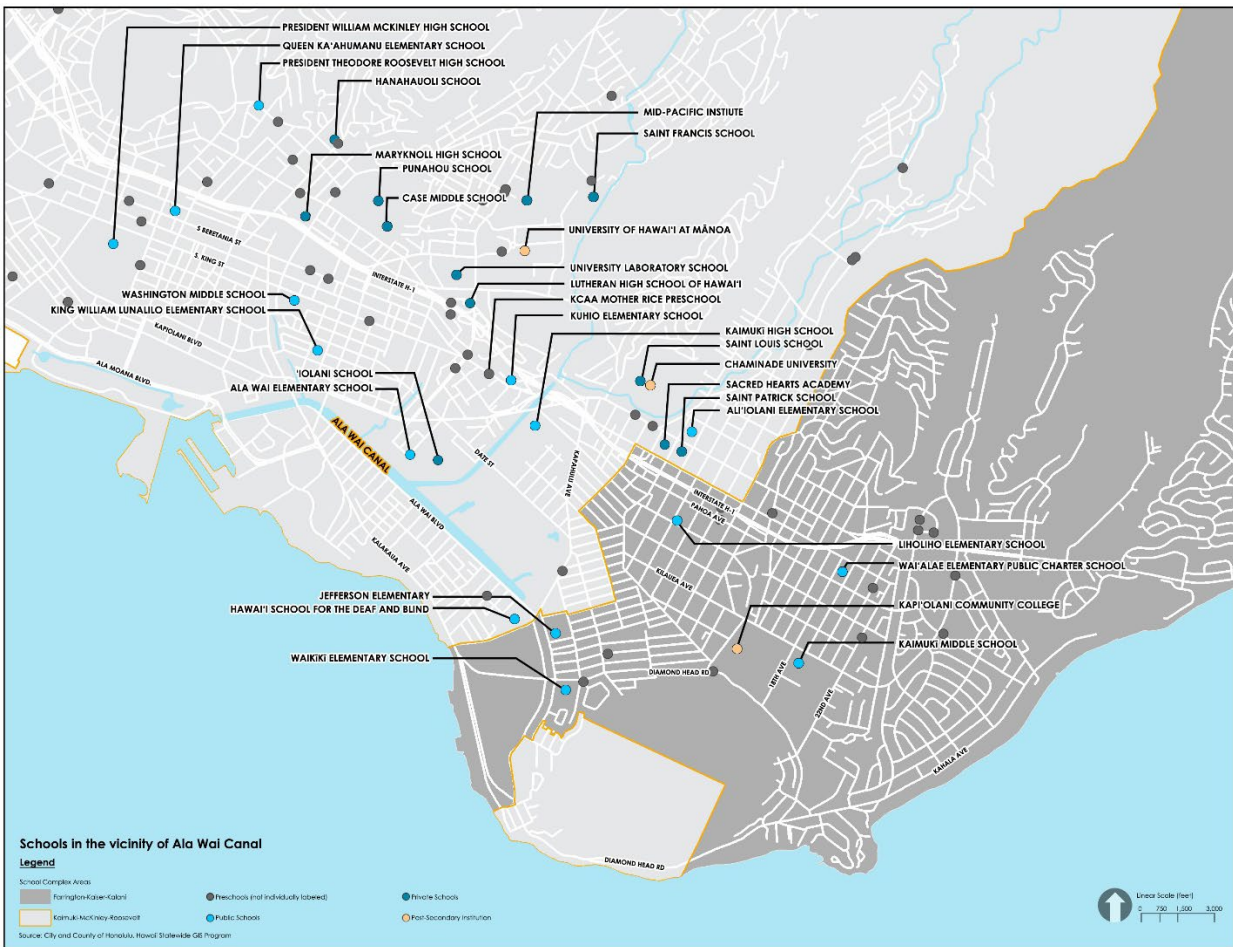
School	Distance From Proposed Project
Jefferson Elementary School	Located adjacent and makai of the Ala Wai Canal and Kapahulu Library
Hawai'i School for the Deaf and Blind	Located adjacent to the Ala Wai Canal near the Kapahulu Library
'Iolani School	Located adjacent and mauka of the Mānoa-Pālolo Drainage Canal
Ala Wai Elementary School	Located adjacent and mauka of the Ala Wai Canal and Mānoa-Pālolo Drainage Canal
Waikīkī Elementary School	Located approximately 0.4 miles from the Kapahulu Library end of the Ala Wai Canal
KCAA Mother Rice Preschool	Located approximately 0.6 miles from the Date Street Bridge, mauka of the Mānoa-Pālolo Drainage Canal
University of Hawai'i at Mānoa	Located approximately 0.9 miles from the Date Street Bridge, mauka of the Mānoa-Pālolo Drainage Canal
King William Lunalilo Elementary School	Located approximately 0.3 miles from the McCully Street Bridge crossing the Ala Wai Canal
Washington Middle School	Located approximately 0.7 miles from the Kalākaua Avenue Bridge crossing the Ala Wai Canal
Maryknoll High School	Located approximately 1 mile from the McCully Street Bridge crossing the Ala Wai Canal
Case Middle School	Located approximately 1 mile from the McCully Street Bridge crossing the Ala Wai Canal
Lutheran High School of Hawai'i	Located approximately 1 mile from the Date Street Bridge, mauka of the MPDC project area
Queen Ka'ahumanu Elementary School	Located approximately 1.2 miles from the Kalākaua Avenue Bridge crossing the Ala Wai Canal
President William McKinley High School	Located approximately 1.2 miles from the Ala Moana Boulevard Bridge crossing the Ala Wai Canal
Sacred Hearts Academy	Located approximately 1.2 miles from the Date Street Bridge, mauka of the MPDC project area
Punahou School	Located approximately 1.3 miles from the McCully Street Bridge crossing the Ala Wai Canal
Chaminade University	Located approximately 1.4 miles from the Date Street Bridge, mauka of the Mānoa-Pālolo Drainage Canal
Kapi'olani Community College	Located approximately 1.4 miles from the Kapahulu Library end of the Ala Wai Canal
Kaimukī Middle School	Located approximately 1.6 miles from the Kapahulu Library end of the Ala Wai Canal
Ali'iolani Elementary School	Located approximately 1.6 miles from the Kapahulu Library end of the Ala Wai Canal

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

School	Distance From Proposed Project
Hanahau'oli School	Located approximately 1.7 miles from the McCully Street Bridge crossing the Ala Wai Canal
Wai'ala'e Elementary Public Charter School	Located approximately 1.9 miles from the Kapahulu Library end of the Ala Wai Canal
President Theodore Roosevelt High School	Located approximately 2 miles from the Kalākaua Avenue Bridge crossing the Ala Wai Canal

Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Figure 19 Map of Schools in the Vicinity of the Ala Wai Canal



POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

This section presents potential impacts and suggested mitigation measures related to local transportation activity. Transportation-related impacts and mitigation measures are also discussed in Chapter 6, which focuses on transportation infrastructure.

Create a New Crossing

Kālainmoku-University Alignment

Potential impacts to local transportation activity resulting from a new crossing include:

- Less vehicular traffic - Converting current car and motorcycle trips to and around the Ala Wai Canal area to biking and walking trips. Based on OahuMPO mode share data for all trip types, non-drive alone travel is more common among residents living around the Ala Wai Canal than in Honolulu overall, as 31% of canal residents travel by walking, bicycling, or riding transit today, compared to 22% of the county (Figure 14). Those neighbors who are already accustomed to travel by non-drive alone modes may welcome a new or enhanced canal crossing.

Based on 24-hour travel counts collected on September 27 and 29, 2018,¹⁹ and Airsage mobile data collected October 1-31, 2018, over 52,000 of the daily car and motorcycle trips crossing the Ala Wai Canal are within a 2 mile bikeshed of Waikīkī (Figure 15). These trips have the potential to be converted to bicycling and walking trips with more connective and safer walking and bicycling infrastructure.

- Broader walk and bikeshed – Expansion of the walk and bikesheds around Waikīkī to enable approximately 3,000 more people to commute across the canal by walking or bicycling (Figure 17).
- Bicycle network – A share of the estimated additional bike and pedestrian trips will represent additional utilization of existing bike facilities throughout the canal area, and extending into Mānoa, potentially stressing capacity or maintenance factors
- More efficient travel – A new canal crossing could improve commute times and reduce congestion for the existing biking and walking trips that would benefit from bridge travel across the Ala Wai Canal. In particular, the approximately 7% of daily biking and walking trips (or 2,730 existing trips) that utilize Kapahulu Avenue to get around the east end of the canal may benefit from either a more direct commute into or out of Waikīkī or reduced biking and pedestrian traffic on Kapahulu Avenue (see Figure 11).
- Enhanced mobility – A new and convenient non-vehicular crossing could also lead to more travel between the mauka and makai sides of the canal area, providing mobility to persons who do not have access to vehicles and were less inclined to cross at the existing locations, or to travel alongside motor vehicles.

¹⁹ The 24-hour travel counts were taken on one weekday and one weekend day in September 2018 at the following locations: McCully Street from Kapi'olani Boulevard to Kalākaua Avenue (McCully Bridge), Ala Moana Boulevard from Ala Moana Park Drive to Holomoana Street (Ala Moana Bridge), Kalākaua Avenue from Kapi'olani Boulevard to McCully Street (Kalākaua Bridge), and Ala Wai Boulevard from Wai Nani Way to 'Āinakea Way (closest estimate to Kapahulu Avenue).

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

- Safety - Kapahulu Avenue, as well as the three existing canal bridges, currently share the roadways with motor vehicles, bicycles, and pedestrians. Reducing the number of bicycle and pedestrian trips in close proximity with cars, motorcycles, and other vehicles will also improve overall safety for commuters biking and walking into and out of Waikīkī. There are 23 schools within 2 miles of the Ala Wai Canal (Figure 18). Ala Wai Elementary School and the ʻIolani School are the two schools closest to the Ala Wai Canal, and are in the immediate vicinity of proposed Ala Pono alignments. A new crossing will also provide safer bike and pedestrian access from Waikīkī to the many schools in the vicinity of the Ala Wai Canal, as well as up towards the University of Hawaiʻi at Mānoa .
- Construction period - Construction of a new crossing may temporarily impact the vehicle, bike, and pedestrian traffic along Ala Wai Boulevard, on the makai side of the Ala Wai Canal. A new crossing is not anticipated to have any negative long-term effects to the local transportation activity along the Ala Wai Canal.

Suggested mitigation measures to address local transportation impacts include:

- ➔ Public engagement throughout the analysis of proposed canal crossing alignments to ensure the Ala Pono alignment continues to support and improve existing local active transportation networks.
- ➔ Engagement with school officials, parents, and students throughout the project, to learn more about how the Ala Pono crossing could best serve student travel and protect student safety and security.
- ➔ Construction activity mitigation to reduce impacts to the flow of existing traffic along Ala Wai Boulevard as well as existing bike and pedestrian traffic along the mauka side of the canal. Depending on the location of a new crossing future construction will be coordinated with schools to adequately plan for noise and dust impacts, and in the event of current school access points being temporarily blocked by active construction.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts and suggested mitigations relevant to the alternate crossing alignment as related to local transportation activity are expected to be substantially the same as for the preferred alignment.

Enhance Existing Bridges

Potential impacts of the alternative to enhance existing bridges include:

- Safety – Enhancement of the bridge infrastructure could offer safer bike and pedestrian travel connecting the west end of Waikīkī to Ala Moana and McCully/Mōʻiliʻili neighborhoods. Over 52,000 daily car and motorcycle trips crossing the Ala Wai Canal are within a 2 mile bikeshed of Waikīkī (Figure 11). Many of these trips have the potential to be converted to bicycling and walking trips with more connective and safer walking and bicycling infrastructure from enhancing the existing bridges.
- Greater multimodal utilization - Enhancements to existing bridges would improve and possibly encourage more walking and biking commutes from Waikīkī to schools in the vicinity of the Ala Wai Canal by providing safer connections across these bridges. However, this alternative is expected to have less beneficial impacts in this respect, and

more benefit to the west than would the proposed new crossings. It is likely that any additional walking or biking would be mostly to access schools in the Ala Moana and McCully/Mō'ili'ili neighborhoods based on current bike- and walksheds (see Figure 19).

- Construction - Implementation of the bridge enhancements may temporarily impact the vehicle, bike, and pedestrian traffic along both sides of the McCully Street, Kalākaua Avenue, and Ala Moana Boulevard bridges.
- Enhancements to existing bridges are not anticipated to have any negative long-term effects on the local transportation activity along the McCully Street, Kalākaua Avenue, or Ala Moana Boulevard bridges. All of these bridges already accommodate simultaneous vehicle, bike, and pedestrian traffic and any proposed enhancements would improve the separation of these transportation methods along the bridges.

Mitigation measures to address local transportation impacts from enhancing the existing bridges include:

- ➔ Coordination with the construction contractor to avoid lane closures or congestion during peak traffic hours.
- ➔ Implement construction in phases so as to avoid major traffic restrictions into and out of Waikīkī.

Do Nothing

Should the alternative of no change be selected, modes of transportation will continue at current levels, primarily relying on car and motorcycle travel in the vicinity of the Ala Wai Canal. Bike activity may increase in the vicinity without the proposed Ala Pono alignments due to the implementation of new bike lanes and shared roadways proposed in the O'ahu Bike Plan (2012), which are planned for streets adjacent to the Ala Wai Canal and its existing bridges. However, these improvements may not significantly improve pedestrian connectivity between Waikīkī and its surrounding neighborhoods.

6 TRANSPORTATION INFRASTRUCTURE

LOCAL ROADS

The City and County owns and maintains all roads surrounding the canal, with the exception of Ala Moana Boulevard, which is owned by the State and maintained by the City and County.^{20, 21,}
²² The Department of Transportation Services (DTS) is responsible for the planning and configuration of local roads, and the Department of Facility Maintenance handles day-to-day operations and maintenance.

HECO described road circulation along with the availability of bike lanes and sidewalks in their environmental assessment of underground cable relocation:²³

- Ala Wai Boulevard is a major one-way arterial for northwest bound traffic for the Waikīkī district.
- Kālainoku Street, Kai'olu Street and Hīhīwai Street are collector streets for neighborhood traffic.
- Kālainoku Street and Kai'olu Street are two-lane, one-way roadways heading northbound with on-street parking and sidewalks on both sides of the road.
- University Avenue is four lanes with two lanes headed south bound and two lanes headed north bound with turning lanes, and bike paths and sidewalks on both side of the street.
- Hīhīwai Street is a two-lane roadway with on street parking on the mauka side and drop-off and pick-up lane on the makai side. Sidewalks are also available on both sides of the road.
- Hīhīwai Street is mauka of and adjacent to Ala Wai Elementary school.

ACTIVE TRANSPORTATION INFRASTRUCTURE

A new or enhanced Ala Pono crossing can improve connectivity for people walking and biking across the Ala Wai Canal. To understand which alignments will be most beneficial to filling in gaps in existing networks, this section documents existing pedestrian and bicycling networks.

There are no pedestrian connections between the mauka and makai sides of the canal for the 1.5 miles between the McCully Street bridge and Kapahulu Avenue. The canal is approximately 1.9 miles long, measured from its east end near Kapahulu Avenue, to its mouth at the Ala Wai Boat Harbor. The three existing bridges at Ala Moana Boulevard, Kalākaua Avenue, and McCully Street each have sidewalks on both sides, and connect Waikīkī to the Ala Moana and Mō'ili'ili neighborhoods. However, these sidewalk connections are all within 0.6 miles of the canal outlet. Most streets in Waikīkī and the Mō'ili'ili neighborhoods have sidewalks on both sides.

²⁰ Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

²¹ Street Centerlines (2018) https://honolulu-chnl.opendata.arcgis.com/datasets/180028bc33ad42c699d2b3e4742ee1cc_0

²² Hawai'i 92 - Ala Moana Boulevard / Nimitz Highway (2011) <https://www.aaroads.com/guides/hi-0092/>

²³ Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

Figure 21 maps existing and planned bicycle infrastructure around the Ala Wai Canal, according to the O‘ahu Bike Plan 2018 Update. As with sidewalks, it is important for Ala Pono to connect directly to existing bike networks, while also filling in a key gap across the canal. Currently, there are striped bike lanes on McCully Street and University Avenue in Mō‘ili‘ili, and along Ala Wai Boulevard and Kalākaua Avenue in Waikīkī. The Ala Wai Promenade, Ala Wai Park Trail, ‘Iolani School Trail, and Ala Wai Golf Course trail provide a semi-connected path along and near the mauka side of the canal. The McCully Street bridge is currently the only canal bridge with bicycle infrastructure, having bike lanes in both directions.

A key highlight from the O‘ahu Bike Plan 2018 Update, shown here, is that a bicycle path is planned to cross the Ala Wai Canal, connecting Kālaimoku Street and University Avenue. Several miles of striped, buffered, and protected bike lanes are also planned for both the Waikīkī and the Mō‘ili‘ili neighborhoods. These proposed facilities include the addition of protected bike lanes to the Kalākaua Avenue bridge, and striped bike lanes to the Ala Moana Boulevard bridge.

In June of 2017, Bikeshare Hawai‘i launched its biki bikeshare program in Honolulu. As of January, 2019, the bikeshare program provides 1,300 bikes at 130 bike stations throughout Downtown Honolulu, Kaka‘ako/Ala Moana, and Waikīkī (see Figure 20). While there are many bike stations located in the vicinity of the Ala Wai Canal, the closest stations to the proposed crossing locations include:

- Station 459 McCully/ Mō‘ili‘ili - University & Hihīwai, located one block mauka of the Ala Wai Canal on University Ave in the vicinity of the proposed University alignment.
- Station 313 Waikīkī - Kālaimoku & Ala Wai, located just makai of the canal in the vicinity of the makai side of the proposed University alignment.
- Station 319 Waikīkī - Ala Wai & Seaside, located just makai of the Ala Wai Canal and Ala Wai Golf Course, in the vicinity of the proposed Seaside-Ala Wai Golf Course alignment.
- Station 463 McCully/ Mō‘ili‘ili - Kamoku & Hihīwai, located mauka of the Ala Wai Canal near ‘Iolani School and north west of the proposed Seaside-Ala Wai Golf Course alignment. This station is also located on the opposite side (west) of the Mānoa -Pālolo Drainage Canal to the proposed Seaside-Ala Wai Golf Course alignment.
- Station 465 McCully/ Mō‘ili‘ili - Laau & Date, located mauka of the Ala Wai Canal on the west side of the Date Street bridge, a couple blocks north of the proposed Seaside-Ala Wai Golf Course alignment.

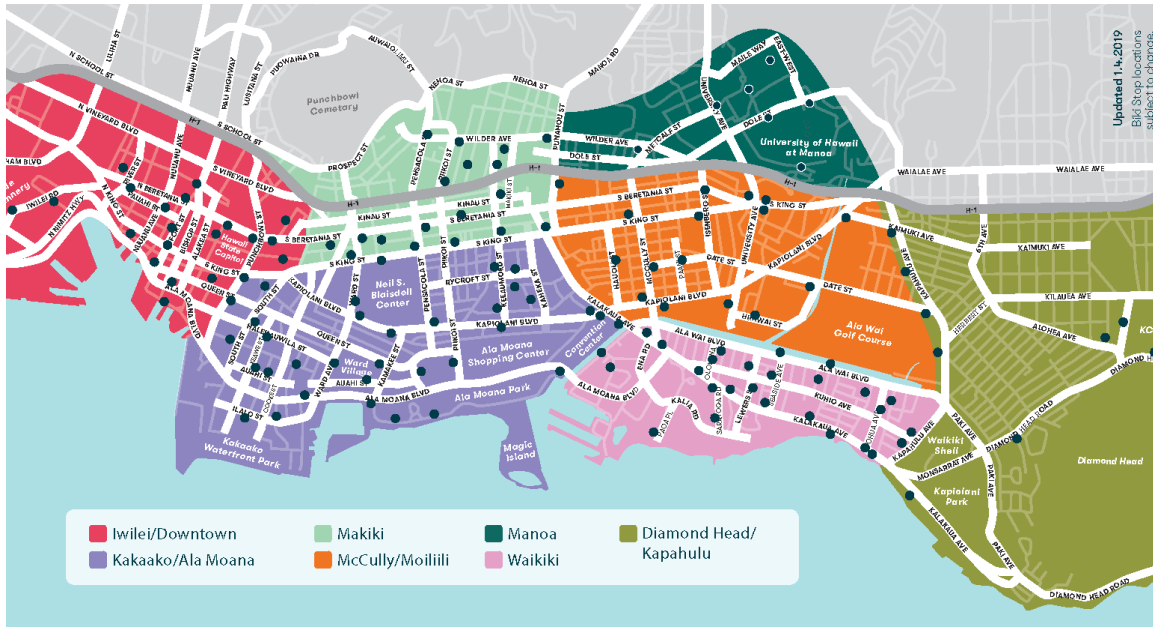
Figure 22 displays the existing 20-minute walk and bike sheds for Waikīkī – these are the areas comfortably within a 20-minute walk or bike ride from central Waikīkī. Figure 23 shows how the size and shape of these areas change if the selected Ala Pono alignment is a new bridge. Based on the area covered in Figure 22, approximately 24,000 people currently live within the Waikīkī walkshed, and 87,000 live within the existing bikeshed.²⁴ Building a new canal crossing between

²⁴ American Community Survey, 2016 five-year estimates, Table B01003

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

the McCully Street bridge and Kapahulu Avenue would add approximately 9,000 more residents each within walking and bicycling distance of Waikīkī.²⁵

Figure 20 Biki Bike Stations

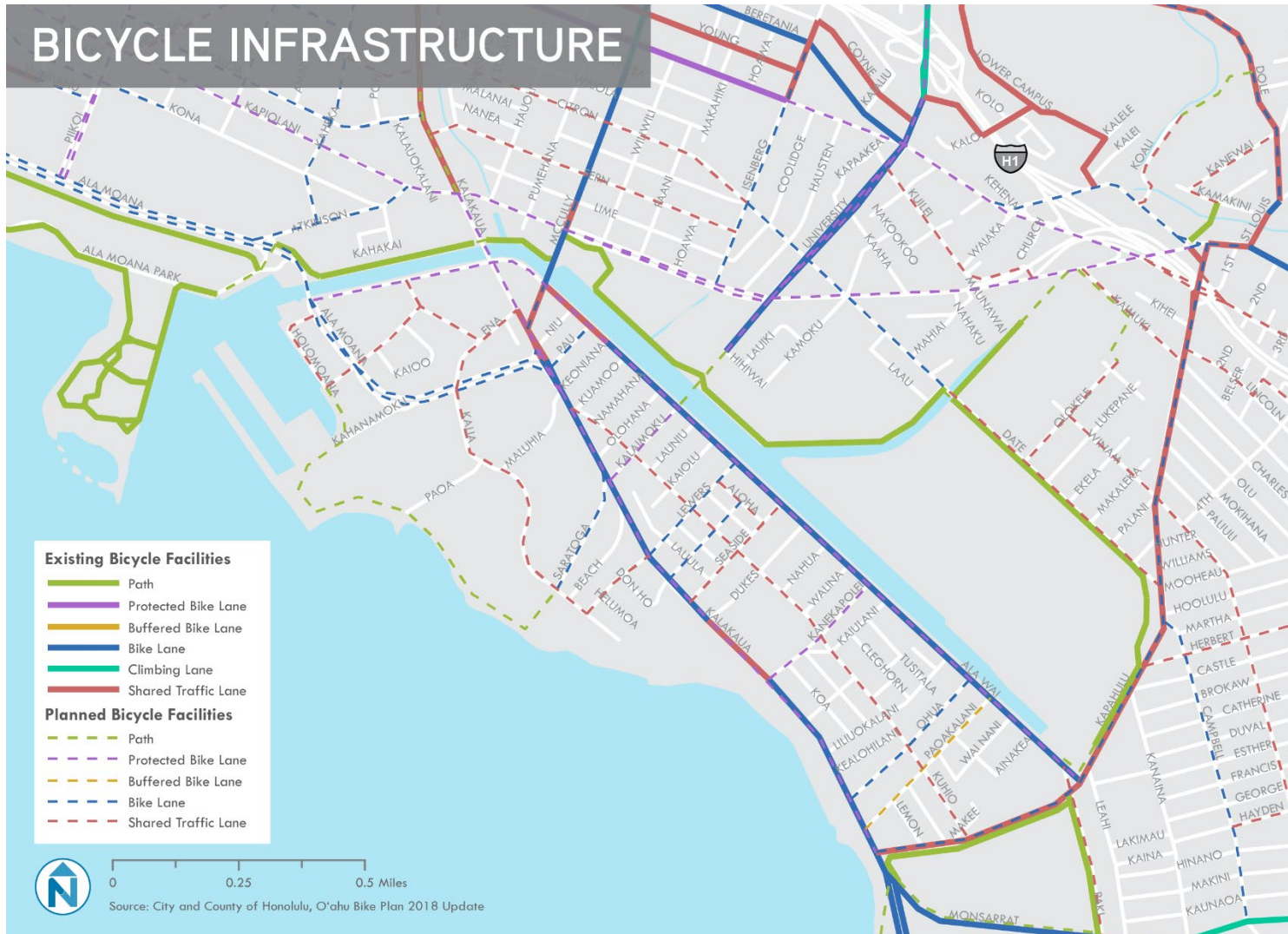


Source: Map of Biki Stops, gobiki.org, 2019.

²⁵ Note: The estimate of 18,000 residents that could be added to the Waikīkī walk and bikesheds (Figure 22, Figure 23) is different from the estimate of 3,000 more people that could commute across the canal by walking or bicycling (Figure 17). Not all residents living within the Waikīkī walk and bikesheds commute to or from Waikīkī, thus the estimate of additional population that could be enabled to commute by walking or bicycling across the canal is less than the estimate of people who could live within a 20-minute walk or bicycle ride of Waikīkī.

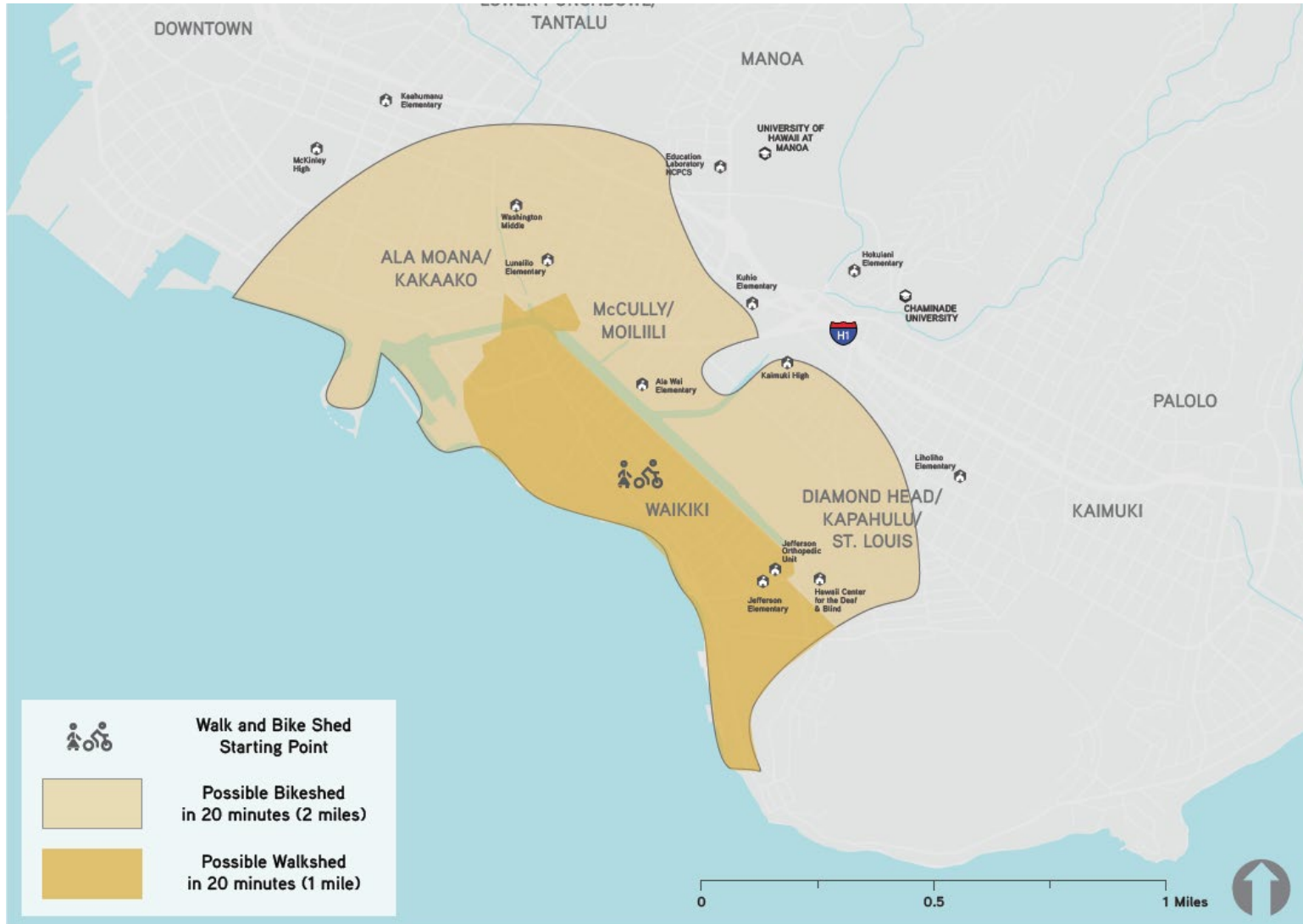
Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 21 Existing and Planned Bicycle Infrastructure



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

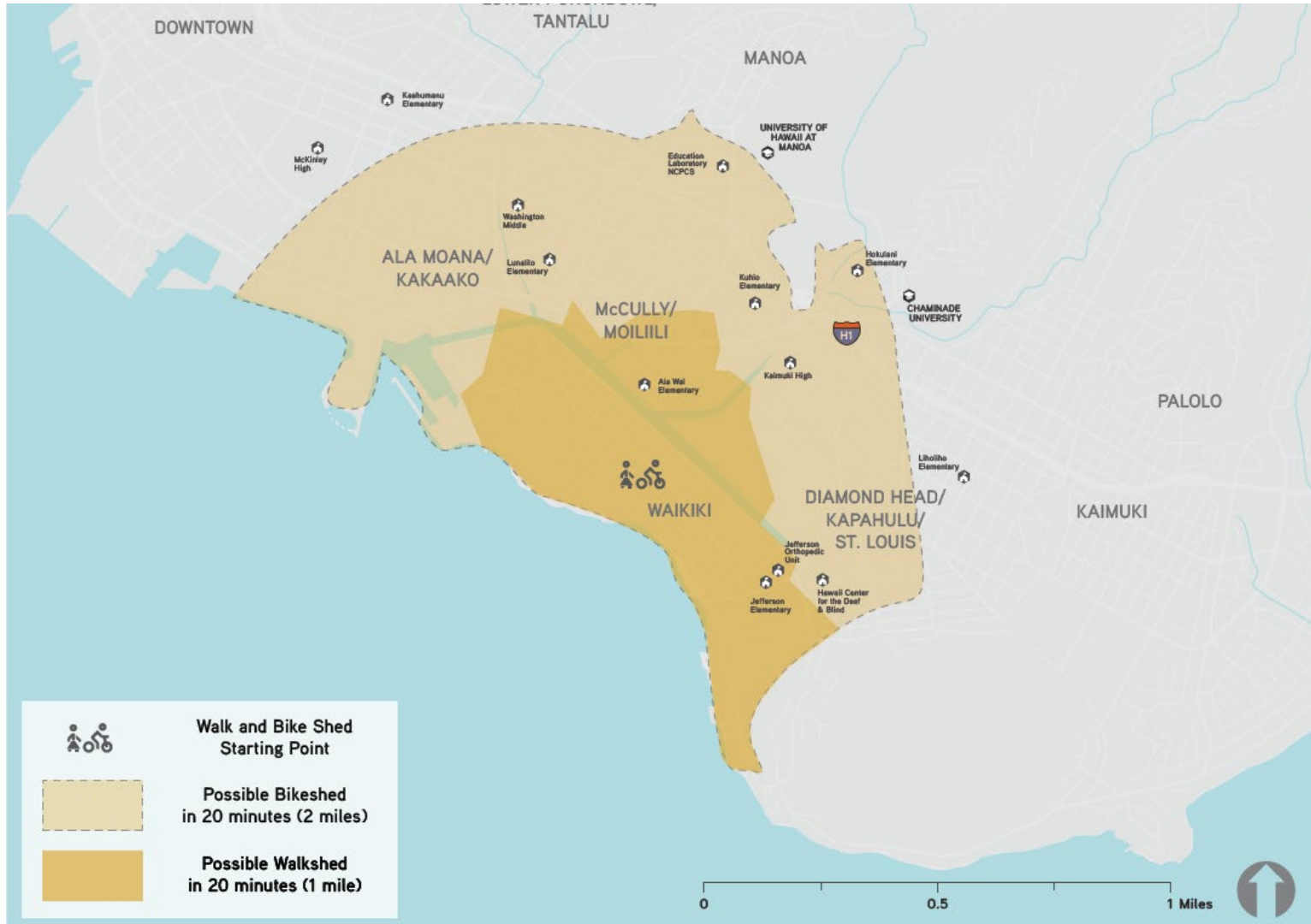
Figure 22 Existing Walk and Bike Shed



Ala Pono, an Ala Wai Crossing | Environmental Setting

City and County of Honolulu

Figure 23 Potential Walk and Bike Shed with a New Crossing



PARKING

While Ala Pono is intended to be for people walking and bicycling, its placemaking features and linkage to City parks and Waikiki require consideration of area parking. Furthermore, if roadway reconfiguration is required to meet other design objectives, there may be changes to local parking supply, especially on-street.

The parking assessment focuses on evaluating the current availability of parking in the study area. It uses parking supply and occupancy data to define the parking ratio. Citywide the goal for is utilization is 85%. This citywide utilization rate is achieved through adoption of parking management strategies to support 85% utilization and turnover in high demand locations balanced with lower and medium demand locations where people can park longer and at a lower cost. This parking assessment informs potential parking management strategies that could be explored through a separate initiative.

Parking Assessment Methodology

Parking supply data was inventoried for on- and off-street parking around the enhanced and new crossing alignments, as shown in Figure 24. Included in this inventory are parking restrictions and pricing.

Parking occupancy data was recorded on three dates to capture a typical weekday, and weekend date at three time points each day: 5:30 AM, 12:00 PM, and 7:00 PM. Occupancy data focuses on areas around the new crossing alignments, as this is the only alternative with potential to impact parking behavior. Private parking facilities not accessible for occupancy counts are removed from the maps.

Parking Supply Findings

The parking supply on both sides of the canal is a mix of public and private spaces.

Mauka of the canal, 515 on street parking spaces are available free of charge and without restriction. There are 887 off-street public spaces in lots and more than 1,700 privately controlled spaces in residential towers and schools.

On the Makai side, the majority of the 744 on-street spaces are free and provided on minor roadways. Two-hour metered parking between the hours of 6 AM and 10PM is applicable to 30% of these spaces. Free parking is provided along Ala Wai Boulevard with tow-away zones in effect on Mondays and Fridays during the hours of 8:30 AM and 11:30 AM. There are 1,740 off-street parking spaces available in public facilities plus additional uncounted off-street parking in private facilities, including residential towers and hotels. Hourly parking fees in the lots surveyed range from \$4 to \$7 during daytime hours. Evening flat rates are provided at three of the off-street parking lots with a starting rate of \$7. Overnight parking is provided at only two of the parking lots, ranging from \$24 to \$34 in price.

Parking Utilization Findings

On-street parking utilization exceeds 80% within the study area and many streets on both sides of the canal see a utilization in excess of 85% throughout the day. Metered block segments experience rates of less than 85%. Off-street public parking is generally at 70% utilization, with

the exception of special events. Calculated utilization rates are demonstrated in Figure 25 through Figure 30. Each time point provides a snapshot of parking demand driven predominantly by a particular user group: residents parking overnight at 5:30 AM, people working nearby at 12:00 PM, and people out for evening recreation at 7:00 PM.

Under-enforcement of the study area results in parked vehicles in on-street areas signed “No Parking” or parked within the restricted areas by driveways and crosswalks during the morning and evening periods.

Key Findings

The utilization of on-street parking within the study area already exceeds the City’s target, with many streets experiencing a rate higher than 85% while off-street facilities are under-utilized at 70%. This usage pattern leaves people with an impression that parking is scarce in the area. Understandably, community members express frustration and concern about the impact of a new crossing on people looking for residential, Waikīkī-bound, and park-access parking.

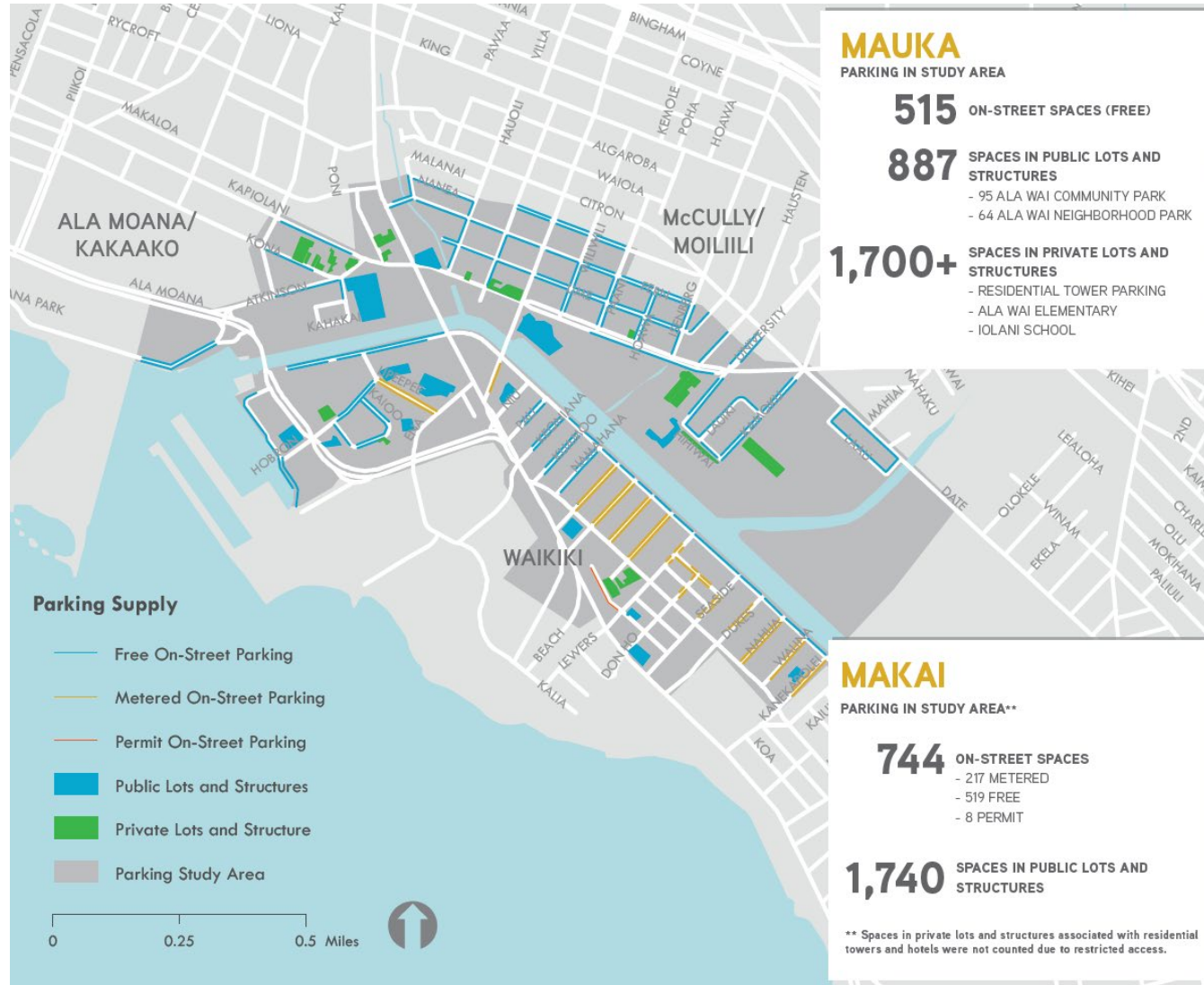
Given this condition, a new Ala Pono crossing is unlikely to make a perceptible difference to nearby on-street parking demand. Any increase in demand for parking as a result of a new crossing is likely to be observed in off-street parking facilities, such as the Ala Wai Neighborhood Parking lot. Some of the pedestrian and bicycle activity across a new crossing will be the result of mode shift out of cars, however this is unlikely to prompt significant changes in local parking demand.

Parking management strategies should be further studied as a separate effort to improve management of existing parking resources. A sample of parking management strategies that could be applied for improved turnover or resident access include:

- Pricing existing parking supply
- Resident Parking Permit program
- Shared-Parking agreements with private lot operators
- Transportation Demand Management services and infrastructure
- Enhanced communication about parking availability
- Shuttle services to the bridge head from remote parking
- Wayfinding, signage, and information improvements

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 24 Parking Inventory Map



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 25 Parking Utilization Map, Weekday 5:30 AM



Figure 27 Parking Utilization Map, Weekday 7:00 PM

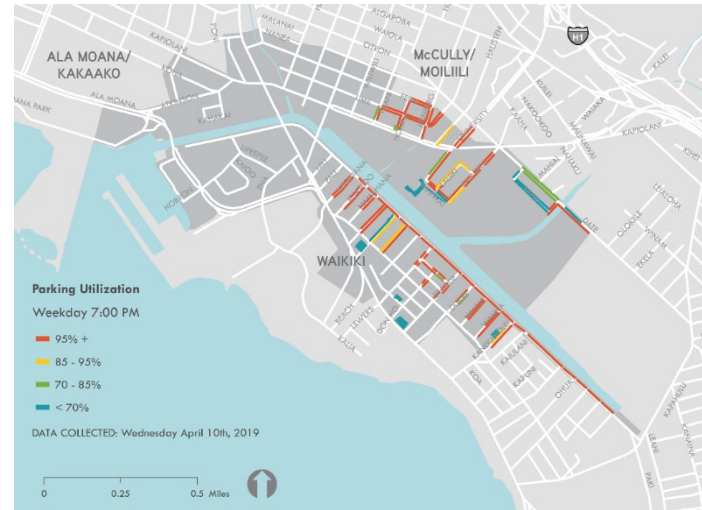


Figure 26 Parking Utilization Map, Weekday 12:00 PM



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 28 Parking Utilization Map, Saturday 5:30 AM



Figure 30 Parking Utilization Map, Saturday 7:00 PM



Figure 29 Parking Utilization Map, Saturday 12:00 PM



POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainmoku-University Alignment

As described in the previous chapter, local 24-hours travel counts and Airsage mobile data indicate that over 52,000 daily car and motorcycle trips crossing the Ala Wai Canal have the potential to be converted to bicycling and walking trips with more connective and safer walking and bicycling infrastructure (Figure 17).

As shown in Figure 22 and Figure 23, an estimated 18,000 more residents could gain access to Waikīkī within a 20-minute walk or bike ride, if a new crossing for walking and biking is built over the Ala Wai Canal.²⁶

Figure 25 through Figure 30 reveal that on-street parking on both sides of the canal is mostly at capacity.

Potential impacts resulting from a new crossing, as noted above, include:

- Greater multimodal activity and reach - Expansion of bikeshed areas and potentially increased bicycle traffic. Ala Pono can fill a gap between corridors on both sides of the Ala Wai Canal with existing bike lanes and off-street paths. The O‘ahu Bike Plan 2018 Update proposes a new canal crossing to fill one of these gaps with a bicycle path connecting Kālainmoku Street and University Avenue.
- Parking – With on-street parking on both sides of the canal mostly at capacity, it is unlikely a new Ala Pono crossing will make a significant and perceivable difference to parking demand. Any increase in demand for parking near a new crossing would be observed in existing off-street parking facilities, such as the Ala Wai Neighborhood Park lot.
- Based on the proposed crossing alignments, on-street parking along Ala Wai Boulevard may be removed or reconfigured.

Suggested mitigation measures to address the above include those noted in Chapter 5, as well as:

- ➔ The capacity of the existing bike network on both sides of the canal, including bike paths and routes, and bike parking facilities, should be evaluated with respect to its ability to support this additional utilization.
- ➔ Review capacity of facilities and services relevant to the area bicycle network; consider appropriateness of Waikīkī Special District design or building standards for public and private structures with respect to bicycle parking or other facilities and amenities, in consideration of the potential additional traffic.

²⁶ Note: The estimate of 18,000 residents that could be added to the Waikīkī walk and bikesheds (Figure 22, Figure 23) is different from the estimate of 3,000 more people that could commute across the canal by walking or bicycling (Figure 17). Not all residents living within the Waikīkī walk and bikesheds commute to or from Waikīkī, thus the estimate of additional population that could be enabled to commute by walking or bicycling across the canal is less than the estimate of people who could live within a 20-minute walk or bicycle ride of Waikīkī.

- Parking management strategies should be further studied as a separate effort to improve management of existing parking resources. A sample of parking management strategies that could be applied for improved turnover or resident access include:
 - Pricing Existing Parking Supply
 - Resident Parking Permit Program
 - Shared-Parking Agreements with Private Lot Operators
 - Transportation Demand Management Services and Infrastructure
 - Enhanced Communication about Parking Availability
 - Shuttle Services to the Bridge Head from Remote Parking
 - Wayfinding, Signage, and Information Improvements
- A safer bike and pedestrian crossing could also mitigate the impacts of some or all car parking spaces potentially lost.
- Parking and lane restriping on other nearby roads could be used to make-up for some spaces lost due to the eventual bridge siting.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts and suggested mitigations relevant to the alternate crossing alignment as related to transportation infrastructure are expected to be substantially the same as for the preferred alignment, except that the impact areas could be expanded and affect streets to the west of University Avenue.

Enhance Existing Bridges

Potential impacts and suggested mitigations relevant to the alternative to enhance existing bridges are substantially the same as stated in Chapter 5.

Do Nothing

Should the alternative of no change be selected, modes of transportation will continue at current levels, primarily relying on car and motorcycle travel in the vicinity of the Ala Wai Canal. Bike activity may increase in the vicinity without the proposed Ala Pono alignments due to the implementation of new bike lanes and shared roadways proposed in the O‘ahu Bike Plan (2012), which are planned for streets adjacent to the Ala Wai Canal and its existing bridges. However, these improvements may not significantly improve pedestrian connectivity between Waikiki and its surrounding neighborhoods.

7 LAND USE

Existing land uses, along with zoning regulations provide important community context for considering the project alternatives.

PARCEL OWNERSHIP

Installing a new or enhanced crossing over the canal requires coordination and engagement with multiple government agencies, who play various roles in the day-to-day operations of land in and around the canal. Figure 31 and Figure 32 provide a list of facilities and parcels adjacent to the canal, and the agencies responsible for them.

Figure 31 Parcel Ownership in the Ala Wai Canal Area

Facility / Parcel	Owner	Operator
Ala Wai Canal	State of Hawai'i	Board of Land and Natural Resources (BLNR) / Department of Land and Natural Resources (DLNR)
Ala Wai Neighborhood Park	State of Hawai'i	Honolulu Department of Parks and Recreation (State of Hawai'i E.O. 569 & 2036 to City and County of Honolulu for park purposes)
Ala Wai Community Gardens	City and County of Honolulu	Honolulu Department of Parks and Recreation
Streets neighboring the canal	City and County of Honolulu	Honolulu Department of Facility Maintenance
Ala Wai Elementary School	State of Hawai'i	Hawai'i Department of Education
Ala Wai Promenade	City and County of Honolulu	Honolulu Department of Facility Maintenance
Ala Wai Golf Course	City and County of Honolulu	Honolulu Department of Enterprise Services
Waikiki-Kapahulu Public Library	State of Hawai'i	Hawai'i State Public Library System

Source: Honolulu Department of Transportation Services; Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

Figure 32 Parcel Ownership Map



The Ala Wai Canal is owned by the State of Hawai'i and the land surrounding the makai side of the proposed bridge alignment is within the City and County of Honolulu jurisdiction. The land surrounding the mauka side of the proposed bridge alignment, however, is owned by the State of Hawai'i and maintained by the City and County of Honolulu by Executive Order (State of Hawai'i E.O. 569 & 2036 to City and County of Honolulu for park purposes).

LAND USE AND ZONING

Land uses surrounding the Ala Wai Canal include a mix of residential, education, parks and schools. Residential condominiums and apartments comprise much of the use on the makai side of the canal. Recreation and education uses dominate much of the mauka side, including the Ala Wai promenade, community park, neighborhood park, community garden, and golf course, as well as Ala Wai Elementary School and the Iolani School. The following subsections describe the state and local zoning that govern these uses.

State Land Use District

All lands in the State of Hawai‘i are placed into four land use districts, “Urban”, “Rural”, “Agricultural”, and “Conservation”. State land use districts are mapped in Figure 33. All of the Ala Wai Canal and parcels adjacent to it are designated “Urban”. According to HRS § 205-2 (1976), the State’s urban land use designation defers power to local counties to determine activities or uses allowed.²⁷

City and County of Honolulu Zoning & Special Districts

Land uses as defined by the City and County of Honolulu Land Use Ordinance (LUO) (Chapter 21, Revised Ordinances of Honolulu) are mapped in Figure 34.

Mauka Side: Diamond Head Special District

Lands immediately mauka of the canal are within the Diamond Head Special District (ROH Chapter 21-9.40). The thrust of this Special District is to preserve the public views of Diamond Head and to protect the “park like character” of the Diamond Head Monument’s slopes. The Diamond Head Special District does not have alternate zoning precincts, however, there are design controls that are enumerated in ROH Chapter 21-0.40-4, and height restrictions which are mapped in ROH 21-9.5. Landscaping design controls include tree removal/replacement requirements. Height controls are depicted in Exhibit 21-9.5. The Ala Wai Park and Golf Course all have a zero-foot height limit, implying no new buildings or structures are anticipated. Design controls require that all architectural forms are designed to be of a scale, exterior finish, material, colors, components and features that relate in a compatible manner to nearby existing structures, particularly small-scale development; and, non-reflective and “subdued in nature”.

Lands on the canal’s mauka side are largely zoned for medium and low-density residential uses – approximately 1,778 acres (Figure 34). Parcels adjacent to the canal are predominantly zoned for preservation, with the exception of medium-density residential and neighborhood commercial uses between the McCully Street and Ala Moana Boulevard bridges. Preservation zoning includes the Ala Moana and Ala Wai parks, Ala Wai Elementary School, and Ala Wai Golf Course. Moving inland from these preservation areas, the McCully/Mō‘ili‘ili neighborhood is zoned in layers, with high-density residential south of Kapi‘olani Boulevard, medium-density residential north of Kapi‘olani, and neighborhood commercial closer to the H1 highway. The Ala Moana/Kaka‘ako neighborhood is predominately neighborhood commercial with some high-density residential uses mixed in.

Makai Side: Waikīkī Special Design District

The Ala Wai Canal and the Waikīkī neighborhood makai of the canal are within the Waikīkī Special District, illustrated in Figure 34. This Special District’s requirements are detailed in ROH Section 21-9.80.

The purpose statement that supports the formation of the Waikīkī Special District is:

Sec. 21-9.80: (a) *Waikīkī is a recognized symbol of Hawai‘i; and the allure of Waikīkī continues, serving as the anchor for the state’s tourist industry.*

²⁷ HRS § 205-2 (1976) https://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0205/HRS_0205-0002.htm

In addition to its function as a major world tourist destination, Waikīkī serves as a vital employment center and as a home for thousands of full-time residents.

(b) The creation of the Waikīkī special district was largely a response to the rapid development of the 1960s and 1970s, and the changes produced by that development. Now, Waikīkī can be described as a mature resort plant and residential locale. Waikīkī needs to maintain its place as one of the world's premier resorts in an international market; yet, the sense of place that makes Waikīkī unique needs to be retained and enhanced.

(c) Waikīkī needs to maintain its place as one of the world's premier resorts in an international market; yet, the sense of place that makes Waikīkī unique needs to be retained and enhanced.

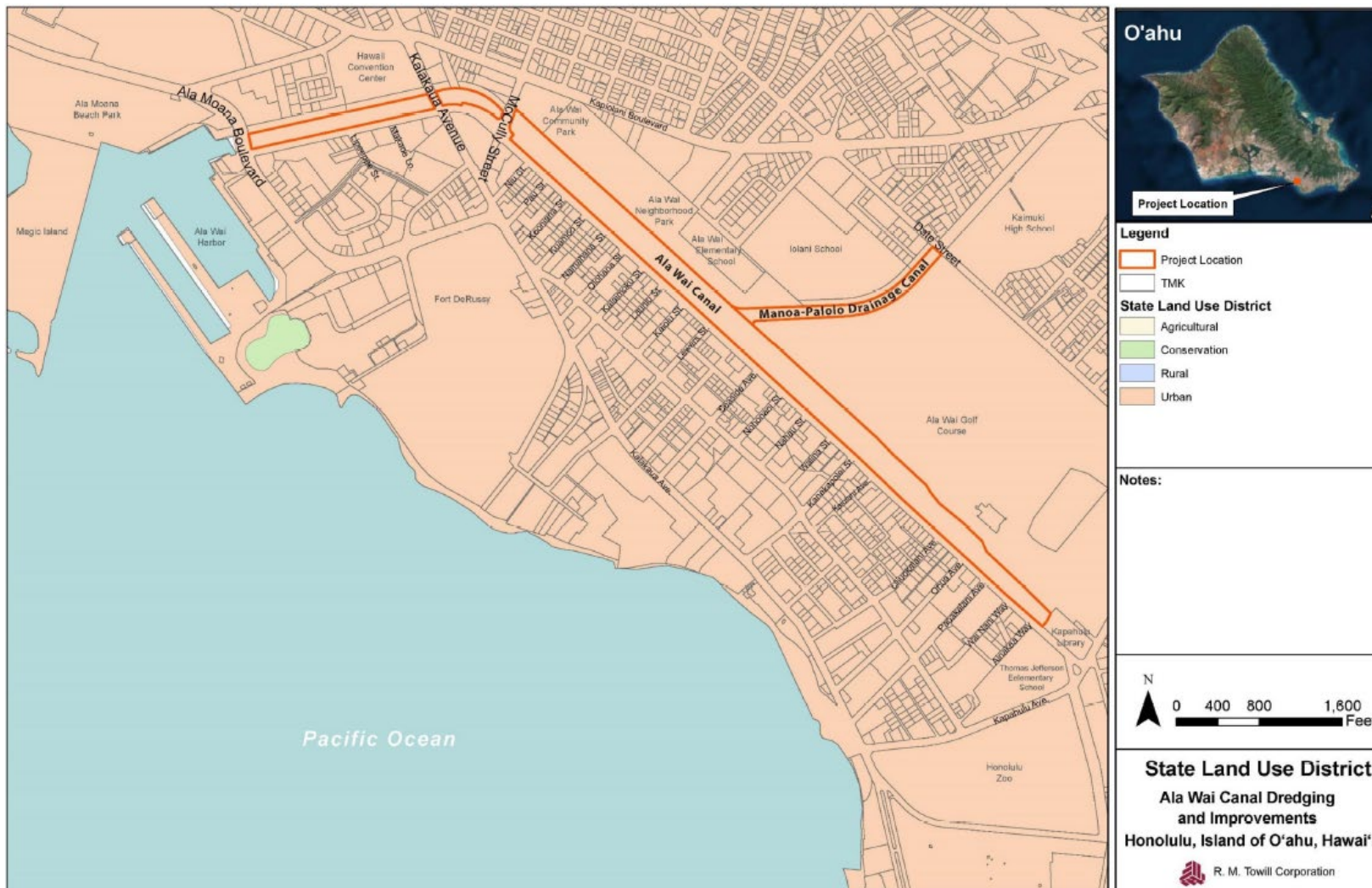
The following three of the 14 defined objectives for the Waikīkī special district, specify intentions for non-automobile travel in the district (Sec. 21-9.80-1):

- *(e) “Support efficient use of multimodal transportation in Waikīkī, reflecting the needs of Waikīkī workers, businesses, residents, and tourists. Encourage the use of public transit rather than the private automobile, and assist in the efficient flow of traffic.”*
- *(j) “Maintain, and improve where possible: mauka views from public viewing areas in Waikīkī, especially from public streets; and a visual relationship with the ocean, as experienced from Kalākaua Avenue, Kālia Road and Ala Moana Boulevard. In addition, improve pedestrian access, both perpendicular and lateral, to the beach and the Ala Wai Canal.”*
- *(l) “Emphasize a pedestrian-orientation in Waikīkī. Acknowledge, enhance and promote the pedestrian experience to benefit both commercial establishments and the community as a whole. Walkway systems shall be complemented by adjacent landscaping, open spaces, entryways, inviting uses at the ground level, street furniture, and human-scaled architectural details. Where appropriate, open spaces should be actively utilized to promote the pedestrian experience.”*

The Special District is divided into zoning precincts, unique to Waikīkī (ROH Exhibit 21-9.13). Within the Waikīkī Special District, the canal and the parcels adjacent (makai) are zoned as a public precinct. The two permitted principal uses in this precinct are public uses and structures, and utility installations. The rest of the district on the makai side of the canal – approximately 612 acres – is designated for apartment and commercial resort uses (Figure 34).

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

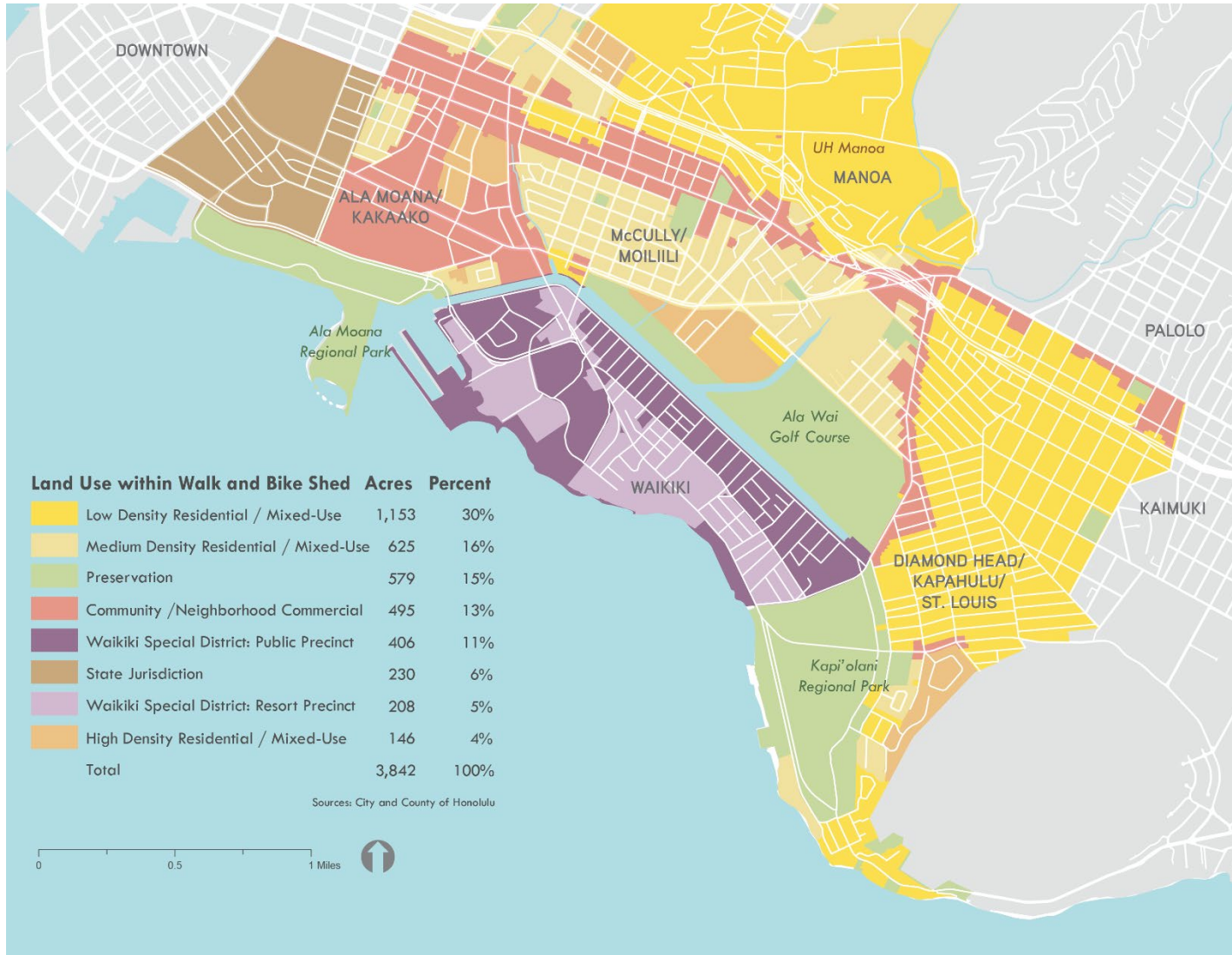
Figure 33 State Land Use Districts



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 34 Local Land Use Designations



Ala Pono, an Ala Wai Crossing | Environmental Setting
 City and County of Honolulu

Figure 35 Special Design Districts



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainmoku-University Alignment

The Ala Pono crossing will not have a significant impact on land use or ownership. The land surrounding the makai side of the proposed bridge alignment is within the City and County of Honolulu jurisdiction (by Executive Order) and thus land acquisitions are not anticipated.

If a new bridge is constructed at this alignment, certain federal, state and county permits will be required (see Section 3 of this report). At this alignment, the bridge would be in both the Diamond Head and Waikīkī Special District. A bridge is urban infrastructure, supportive of the State land use district, “Urban”, it can also be considered of the Diamond Head and Waikīkī Special Districts in that it creates additional opportunities for views of Diamond Head, while supporting walkability.

Suggested mitigation measures include:

- Incorporate Diamond Head and Waikīkī Special District design guidelines into the design of the bridge in preparation for Special District Permit applications.
- The public agencies listed in Figure 31 who own and operate land in and around the Ala Wai Canal should be engaged as stakeholders through the Ala Pono alignment evaluation process. In particular, the State Department of Education as it relates to Ala Wai Elementary, Honolulu’s Department of Parks and Recreation as it relates to Ala Wai Park uses.
- Given the proposed footprint of the project, it is assumed that the City will coordinate with State DLNR for arrangements regarding land needed to support the project.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

The Ala Pono crossing will not have a significant impact on land use or ownership. The land surrounding the makai side of the proposed bridge alignment is within the City and County of Honolulu jurisdiction (by Executive Order) and thus land acquisitions are not anticipated. A landing on the golf course would require some design considerations to avoid conflicting uses and to control access to/from the golf course.

This alignment would also straddle the canal with potentially greater impacts to the Diamond Head Special District.

Suggested mitigation measures include:

- Incorporate Diamond Head and Waikīkī Special District design guidelines into the design of the bridge in preparation for Special District Permit applications.
- Coordinate closely with the Department of Enterprise Services to design a golf course landing that is as compatible as possible with the golf course use.
- The public agencies listed in Figure 31 who own and operate land in and around the Ala Wai Canal should be engaged as stakeholders through the Ala Pono alignment evaluation process.

- Given the proposed footprint of the project, it is assumed that the City will coordinate with State DLNR for arrangements regarding land needed to support the project.

Enhance Existing Bridges

If one or more existing bridges are enhanced, a Special District (minor) permit will likely be required.

Suggested mitigation measures include:

- Incorporate Diamond Head and Waikī Special District design guidelines into the design of the bridge in preparation for Special District Permit applications.

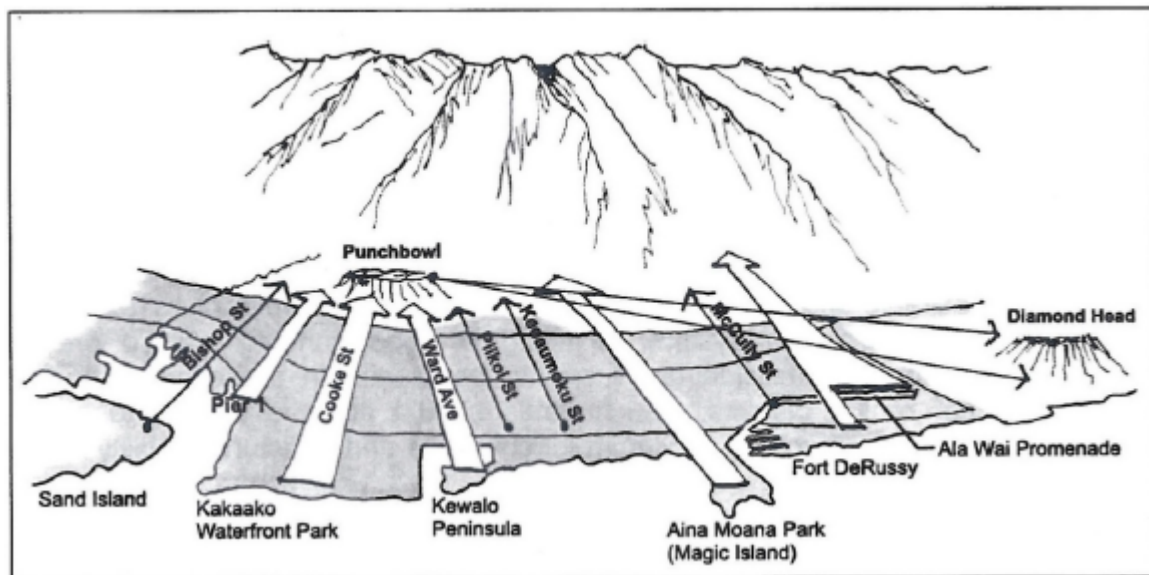
Do Nothing

Should the alternative of no change be selected, no impacts are anticipated to land use districts, however, opportunities to further the objectives of the Waikī Special District relating to pedestrian environment will also not be realized.

VISUAL RESOURCES

Scenic views play an integral role in sense of place around the Ala Wai Canal. Popular views from the makai side of the canal include the Ko‘olau mountain range, and Diamond Head at the canal’s south end. Popular views on the mauka side of the canal include the towers that comprise the Waikiki skyline. Figure 36 provides a diagram of views in Honolulu’s urban center.

Figure 36 Diagram of Local Panoramic Views



Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainokū-University Alignment

The Ala Pono crossing may have minor impacts to the visual resources in the vicinity of the Ala Wai Canal, in particular, views from surrounding schools, parks, playing fields, and buildings makai of the canal. While views of the Ala Wai from the surrounding area may be slightly altered with the implementation of the Ala Pono crossing, it is not anticipated to disrupt the entire viewshed and minor visual impacts can be mitigated. Beneficial impacts may include new opportunities for views of Diamond Head monument.

Suggested mitigation measures include:

- Prospective Ala Pono alignments should be assessed for how they impact prominent local viewsheds, as these are important components of the Ala Wai Canal’s sense of place. Efforts should be made to plan and design Ala Pono in a way that minimizes, avoids, or enhances these views.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts and suggested mitigations relevant to the alternate crossing alignment as related to land use are expected to be substantially the same as for the preferred alignment.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, no impacts are anticipated for visual resources. Enhancements to the existing bridges will not change the current use of the bridges nor affect the visual components of the bridges.

No mitigation measures are suggested at this time.

Do Nothing

Should the alternative of no change be selected, no impacts are anticipated to visual resources, and no mitigations are suggested at this time.

8 PUBLIC SERVICES AND UTILITIES

EMERGENCY SERVICES

In an emergency situation, the directness of travel path between responders and the site of an emergency can play a large role in response time, and potential for success in addressing the situation at hand. This section outlines who is tasked with emergency response duties in the Ala Pono project area, and highlights details related to how crossing alignments impact the ability to respond. Figure 37 maps the locations of various emergency service providers in the Ala Pono project area.

Figure 37 Emergency Service Centers



Police

The Honolulu Police Department (HPD) divides O‘ahu into 8 districts. The Ala Pono project area is in HPD Districts 6 and 7. HPD patrols in Waikiki are based out of the Waikiki Substation, and patrols on the canal’s mauka side are based out of District 7 office on Beretania Street.

Currently, HPD travel from the District 6 station does not generally involve crossing the Ala Wai Canal, as the district is contained on the makai side of the canal. Similarly, HPD District 7 is entirely on the mauka side of the canal, and thus patrols and responses from the District 7 station do not typically cross the canal either.

Pre-Consultation Comments from the HPD indicated no concerns with the proposed project.

Fire

The Hawai'i Fire Department (HFD) serves the Ala Pono project area from Station 29 at the intersection of University and Date streets, Station 2 west of Kalākaua Avenue on Makaloa Street, and Station 7 east of the canal on Kapahulu Street. Each of these three canal area HFD stations is located within a half mile of at least one canal crossing.

Pre-Consultation comments from HFD have been provided. These comments pertain to maintaining sufficient access and water supply to support fire fighting, and noted the requirement to submit plans to HFD for review and approval.

Emergency Medical Services

The Ala Pono project area is in Honolulu Emergency Medical Services (HEMS) District 2, of two. The nearest EMS unit is based at HFD Station 7, on Kapahulu Street. Urgent care services are also available from Straub Doctors on Call, Doctors of Waikīkī, Urgent Care Clinic of Waikīkī and Urgent Care Hawaii.

In May 2016, HEMS expanded its services to include EMTs on bicycles.²⁸

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES (EMERGENCY SERVICES)

Create a New Crossing

Kālainmoku-University Alignment

Potential impacts resulting from a new crossing include:

- An important aspect of emergency response planning relative to the Ala Pono alignment is the way proposed alignments could improve walk times from Waikīkī to a tsunami safe site, or increase the number of people that can reach a tsunami safe site with a shorter walk time. Analysis of pedestrian evacuation travel is described in Chapter 12.
 - Additional evacuation routes - More direct evacuation route and shorter non-vehicular evacuation times from central Waikīkī in the event of an emergency, allowing more persons to leave the makai areas more rapidly.
 - Due to the more efficient evacuation route, potentially more visitors and other Waikīkī inhabitants seeking refuge at Kūhiō Elementary School, the designated shelter, rather than sheltering in place, potentially resulting in more utilization of this shelter.
- Other potential public safety impacts related to vandalism, noise, crime, etc. are presented in Chapter 4.

²⁸ <http://www.hawaiinewsnow.com/story/32010660/ems-expands-service-to-include-bicycles/>

Suggested mitigation measures related to the above include the following:

- ➔ Since the Ala Wai Canal itself is within a Tsunami Evacuation Zone area, its design should particularly consider storm and other emergency resilience as well as accommodations for persons with disabilities.
- ➔ The capacity of Kūhiō Elementary to handle potentially higher utilization should be evaluated, as well as the efficacy of bike and walking routes, and wayfinding signage relative to multimodal means of travel to Kūhiō Elementary from the University Avenue landing.
- ➔ Submit civil drawings to the HFD for review and approval through the building permit process.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts relevant to the alternate crossing alignment as related to emergency services expected to be similar as for the preferred alignment, except that the evacuation route would not be as direct, and hence additional utilization and evacuation time savings may not be as great as under the Kālamoku-University alignment. Police and EMS response travel by foot and bicycle are the only emergency services that have the potential to change based on alignment of Ala Pono.

Additionally, the need to cross the canal twice under the Seaside-Ala Wai Golf Course-Ala Wai Park alignment could pose additional safety risks for users.

Suggested mitigation measures under this alternative alignment include:

- ➔ Those identified for the preferred alignment.
- ➔ The prospective Ala Pono alignments should be assessed for whether or not they enable:
 - HPD foot or bicycle patrols from the District 6 station to respond to emergencies at Ala Wai Elementary School or ‘Iolani School quicker than patrols from the District 7 station.
 - Bicycle EMTs to improve response times in the canal area, especially from HFD Station 7 or 29.
- ➔ Submit civil drawings to the HFD for review and approval through the building permit process.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include:

- Improvements to pedestrian and bike access along the existing bridges, which may improve access for Police and EMS services that utilize the bridges.
 - Consequently, bike and pedestrian access for Police and EMS services may be temporarily hindered along these bridges during the construction or implementation of the bridge enhancements.
- Improved emergency evacuation along the bridges by walking and biking (see additional discussion of emergency evacuation in chapter 12).

Suggested mitigation measures related to emergency services include:

- Coordination with emergency service providers to determine the timing any short-term impacts of bridge enhancements to services that rely on biking and walking along the existing bridges.
- Submit civil drawings to the HFD for review and approval through the building permit process.

Do Nothing

Should the alternative of no change be selected, no impacts are anticipated to the current use and access of emergency services in the vicinity of the canal, however, an opportunity for additional evacuation routes would not be realized.

PUBLIC SERVICES

Waikīkī and its surrounding neighborhoods are home to numerous organizations that provide important public health, wellness, and community facilities to people who live and work in the area. Access to these facilities is also an important factor for those who rely on their services and may rely on walking and biking for all or part of the commute. A few notable public services and facilities in the vicinity of the Ala Wai Canal are listed below, although many more are also present within Waikīkī and its surrounding neighborhoods.

- **Waikīkī Community Center.** According to the Waikīkī Community Center website, this Center provides “crucial multigenerational services to better the lives of all Waikīkī residents” which includes important resources for “human services, social support, lifelong education, and wellness for Waikīkī’s families, keiki, and seniors” (WCC, n.d.). In 2016, the Waikīkī Community Center reported that it served approximately 6,400 senior citizens with programs focused on addressing financial needs, basic needs (food, shelter, etc.), home services, and various other needs for the senior community such as legal and medical assistance. A majority of children at the center are from low-income families and the center programs aim to help them achieve educational benchmarks, successful transitions to kindergarten, as well as family engagement to help improve future education. In addition, the Waikīkī Community Center has helped thousands more through their emergency food pantry, case management contacts, spaces for community gatherings, and activities centered on education, culture, and wellness (WCC, 2016).
- **Waikīkī Health Clinic.** The Waikīkī Health Clinic provides a range of services including medical, dental, preventative care, and social services (Waikiki Health, 2018). The services offered aim to help patients of all ages and socioeconomic backgrounds, including important services for vulnerable communities such as a youth outreach clinic, healthcare for the homeless, and mental health services.
- **Honolulu Community Action Program (HCAP).** Jefferson Elementary School, located at the east end of Waikīkī, offers two classes from HCAP Head Start Program including the A-Plus After School Program run by the Mō‘ili‘ili Community Center and the 21st Century After School Program. The mission of HCAP is to provide “opportunities and inspiration to enable low-income individuals or families to achieve self-reliance”. HCAP includes various “programs and services in six major areas: Early Childhood;

Employment; Education; Economic Development; Emergency & Transitional Programs; and Community Development & Advocacy” (HCAP, n.d.).

- **Mō‘ili‘ili Community Center.** Located mauka of the Ala Wai Canal along University Avenue, the Mō‘ili‘ili Community Center provides programs and services for youth, families, and seniors as well as a Japanese Language School for elementary school children (MCC, n.d.). The Center’s Children & Families Program serves various schools in Honolulu, including Jefferson Elementary School after school programs, located at the east end of Waikīkī. The Center also supports the community by providing rooms in evenings and on weekends for social and service groups to conduct their meetings and activities.

Pre-consultation comments to the project were received from the Department of Community Services (DCS). At the time of pre-consultation, the DCS noted no adverse impact to their activities or projects.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES (PUBLIC SERVICES)

Create a New Crossing

Kālainokū-University Alignment

Potential impacts resulting from a new crossing include increased access to areas mauka and makai of the Ala Wai Canal, which could provide better access to public services for those who can’t drive or who prefer to walk or bike to reach the public facilities. In particular, a new crossing may benefit accessibility for youth centers or homeless services in the vicinity of the Ala Wai.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts relevant to the alternate crossing alignment as related to public services are expected to be similar as for the preferred alignment.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, walking and biking access to public service facilities in the vicinity may increase due to safer routes along the bridges. The bridge enhancements would not have a negative impact on the operations or facilities of public services in the vicinity of the Ala Wai Canal.

Do Nothing

Should the alternative of no change be selected, it is unlikely that there will be any impact to the existing public services in the vicinity of the Ala Wai Canal.

UTILITIES

There are several utility lines within the public right of way on both sides of the canal, as well as underneath the canal itself.

Figure 39, provided in Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017), maps the following utility lines in the vicinity of the University Avenue/Kālainmoku Street and Kai'olu Street corridors:

- Gas
- Sewer
- Water
- Drain
- Telecom
- Electric
- Proposed HECO Cable Realignment

The forthcoming utility assessments is based off of the map and assessment provided in the Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017) as well as Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017) and Ala Wai Canal Flood Risk Management Study, Oahu, Hawai'i, Feasibility Study with Integrated Environmental Impact Statement (2017).

Electricity, Telephone and Cable TV

HECO is the energy provider for the island and is planning a relocation of 46kV cable underneath the Ala Wai Canal (Figure 39, Figure 40 and Figure 40). The proposed relocation of the 46kV cable underneath the Ala Wai Canal is a concern to the proposed Ala Pono Bridge Project as the proposed location of the 46kV cable will run parallel to and in the same corridor as the Ala Pono Bridge.

Additionally, on the Waikīkī side of the Ala Wai Canal, HECO owns ductlines that run parallel with the Ala Wai Boulevard (20-feet from the southwest edge of the Ala Wai Canal), Kālainmoku Street, and Launiu Street and most likely 'Olohana Street Right-of-Ways, as well as two lines that run perpendicular across Kālainmoku Street approximately 100-feet and 320-feet southwest of the southwest edge of the Kālainmoku Street/Ala Wai Boulevard Intersection. HECO improvements on the McCully/Mō'ili'ili side of the Ala Wai Canal are limited to the existing electrical cables in the Hihīwai Street Right-of-Way and the proposed 46kV cable previously mentioned.

Pre-consultation comments from HECO indicated no concerns with the project, but noted the need to maintain continuous access to their facilities.

Hawaiian Telcom provides telecommunications service in the project area. Service lines on the Waikīkī side of the Ala Wai Canal appear to extend from Kūhiō Avenue to the southwest edge of the northeastern most development on each street perpendicular to Ala Wai Boulevard. For Kālainmoku Street, service lines appear to extend from Kūhiō Avenue to approximately 95' southwest of the edge of the Kālainmoku Street/Ala Wai Boulevard Intersection. Service laterals for streets other than Ala Wai Boulevard will likely branch off perpendicular to each main to provide water service to residential and condominium residences on both sides of the streets, if not provided from the next parallel street. Existing improvements on the McCully/Mō'ili'ili side of the Ala Wai Canal extend southwest along University Avenue from Kapi'olani Boulevard to Hihīwai Street where they turn southeast and continue along Hihīwai Street. Pre-consultation comments from Charter Communications indicate no planned projects in the area.

Water

Water service for O‘ahu is provided by The Board of Water Supply. On the Waikīkī side of the Ala Wai Canal, service mains generally run parallel to all streets including Ala Wai Boulevard (12” line and 12” abandoned line), Kālainmoku Street (12” line), and Launiu Street (varies, 12” to 8” line). It is assumed that ‘Olohana Street has a similar service main. Service laterals for streets other than Ala Wai Boulevard will likely branch off perpendicular to each main to provide water service to residential and condominium residences on both sides of the streets. On the McCully/Mō‘ili‘ili side of the Ala Wai Canal, service mains run southwest along University Avenue from Kapi‘olani Avenue to Hihīwai Street where the mains connect and turn southeast and continue along Hihīwai Street. Pre-consultation comments from the Board of Water Supply indicate that there are water transmission lines along the existing bridges that cross the Ala Wai Canal. No future improvements to the water system are known at this time.

Sewer

Sewer service for O‘ahu is provided by the City and County of Honolulu. Two large force mains run parallel to the Ala Wai Canal with Force Main 1 being a 42” force main on the Waikīkī side of the canal in the Ala Wai Boulevard Right-of-Way and Force Main 2 being a 72” force main approximately 45-feet northeast of the bank of the Ala Wai Canal on the McCully/Mō‘ili‘ili side of the canal. As the two large force mains are large transmission mains for the Waikīkī area, careful planning and coordination with the City and County of Honolulu will need to be taken to ensure any improvements related to the Ala Pono Bridge including access and support structures will provide proper clearances and access to existing wastewater mains, and will not negatively impact the two force mains. Additionally, the Beachwalk Buffer Zone, mapped in Figure 40, is centered on the original Force Main 1 sewer which has previously failed. Honolulu Wastewater Systems (WWS) requires that any project within this zone must be sent by them to the City and County of Honolulu, Department of Design and Construction (DDC) for review. The review must find that the proposed alignment, profile, and construction method of a project would not cause undue vibration or disruption of the force main.

Locally, sewer service on the Waikīkī side of the Ala Wai Canal appears to extend from Kūhiō Avenue to the southwest edge of the northeastern most development on each street perpendicular to Ala Wai Boulevard including Kālainmoku Street (10” main) and Launiu Street (10” main). It is assumed that ‘Olohana Street has a similar service main. Service laterals will likely branch off street mains to provide sewer service to residential and condominium residences on both sides of the streets. For Kālainmoku Street, the 10” service main appears to extend from Kūhiō Avenue to approximately 75’ southwest of the edge of the Kālainmoku Street/Ala Wai Boulevard Intersection. Additionally, a 10” branch spurs from the 10” main on Kālainmoku Street and runs northwest perpendicular to the street about 300’ southwest of the edge of the Kālainmoku Street/Ala Wai Boulevard Intersection. Wastewater service on the McCully/Mō‘ili‘ili side of the Ala Wai Canal appears to extend from Kapi‘olani Boulevard southwest along University Avenue and Laukī Street until these streets intersect with Hihīwai Street. Hihīwai Street does not appear to have any wastewater mains in the Hihīwai Street Right-of-Way. No future improvements to the sewage system are known at this time.

Fuel and Utility Gas Lines

Synthetic natural gas service is provided by Hawai'i Gas in the area. Gas service appears to extend from Kūhiō Avenue to the southwest edge of the northeastern most development on each street perpendicular to Ala Wai Boulevard including Kālainmoku Street (2" main) and Launiu Street (2" main); however the Launiu Street service does extend to Ala Wai Boulevard where it tees and runs northwest and southeast along Ala Wai Boulevard till approximately 50-feet away from the edges of the Kālainmoku and Kai'olu Street intersections with Ala Wai Boulevard. It is assumed that 'Olohana Street has a similar service main as to Kālainmoku Street; however that hasn't been confirmed at this time. Service laterals will likely branch off street mains to provide gas service to residential and condominium residences on both sides of the streets. No future improvements to the gas system are known at this time.

Drainage

The City and County of Honolulu, Department of Facility Maintenance maintains drainage facilities including pipes, culverts and intake structures within the Right-of-Way in the project area as well as between the terminus of University Avenue and Ala Wai Canal. On the Waikīkī side of the Ala Wai Canal, two drainage structures (6-foot by 2.5-foot box culvert, and 24" drain line) run parallel to and on the southeast side of the Kālainmoku Street Right-of-Way, cross Ala Wai Boulevard and discharge in the Ala Wai Canal. Various service laterals connect to the box culvert from adjacent condominium structures on both sides of the street, including one that is approximately 40' southwest of the Kālainmoku Street/Ala Wai Boulevard Intersection. Although it does not appear that any drainage lines run parallel to and within the Ala Wai Boulevard Right-of-Way, two drain lines cross Ala Wai Boulevard and discharge in the Ala Wai Canal; one 15-foot northwest and one 80-foot southeast of the respective edges of the Kālainmoku Street/Ala Wai Boulevard Intersection. Drainage improvements within the Launiu Street Right-of-Way appear to be limited to an 18" drainage line that flows to Kūhiō Street and starts approximately 370-feet away from the edge of the Launiu Street's/Ala Wai Boulevard Intersection. On the McCully/Mō'ili'ili side of the Ala Wai Canal, a 10-foot by 8-foot box culvert runs from Kapi'olani Boulevard southwest along and through the terminus of University Avenue to discharge into the Ala Wai Canal. Drainage systems along Hihīwai Street appear to be beyond the project area. No future improvements to the drainage system are known at this time.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 38 Detail Map of Utility Lines Around the Ala Wai Canal, Including Proposed Underground Electrical Cable Re-Alignment

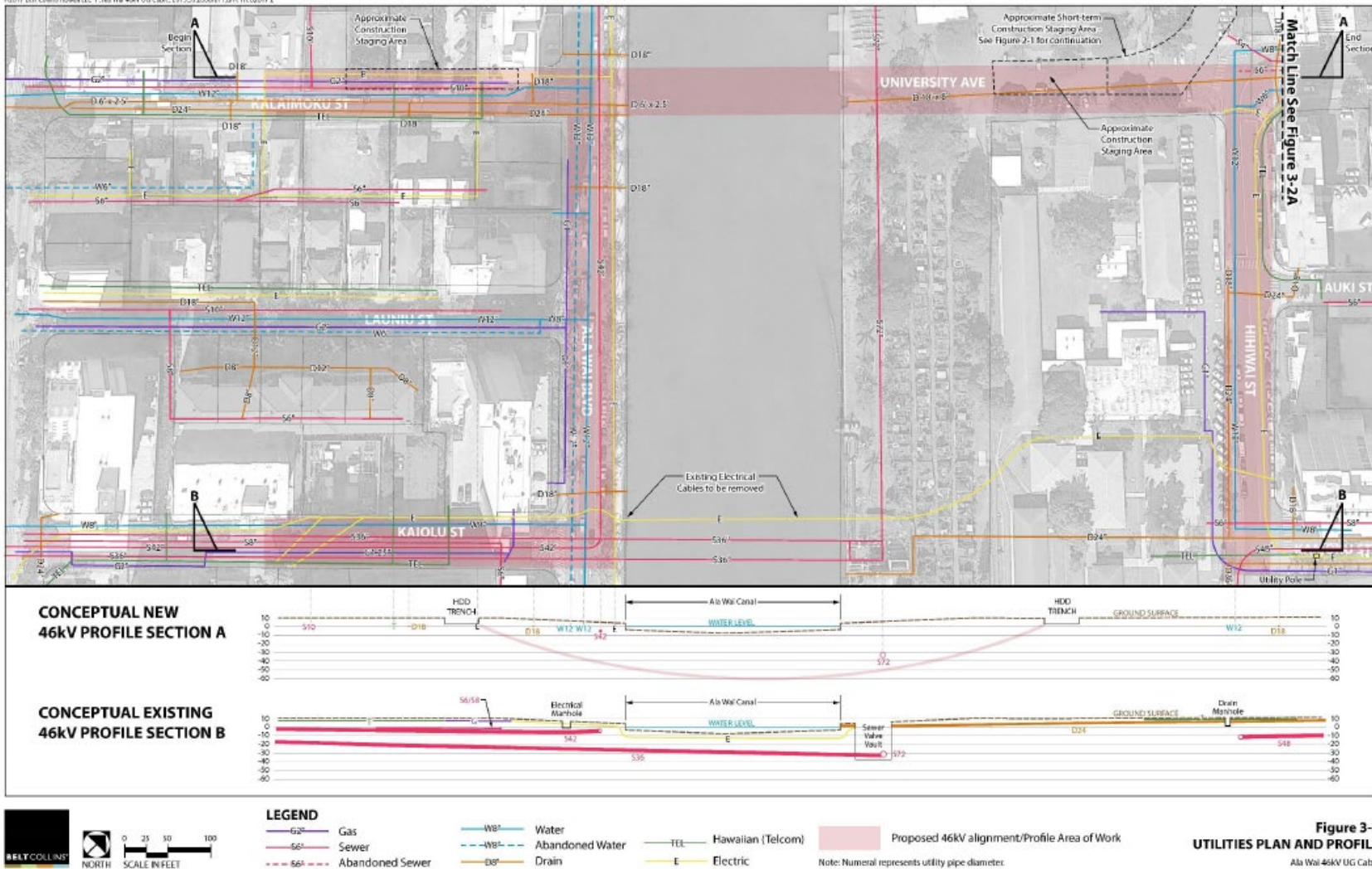
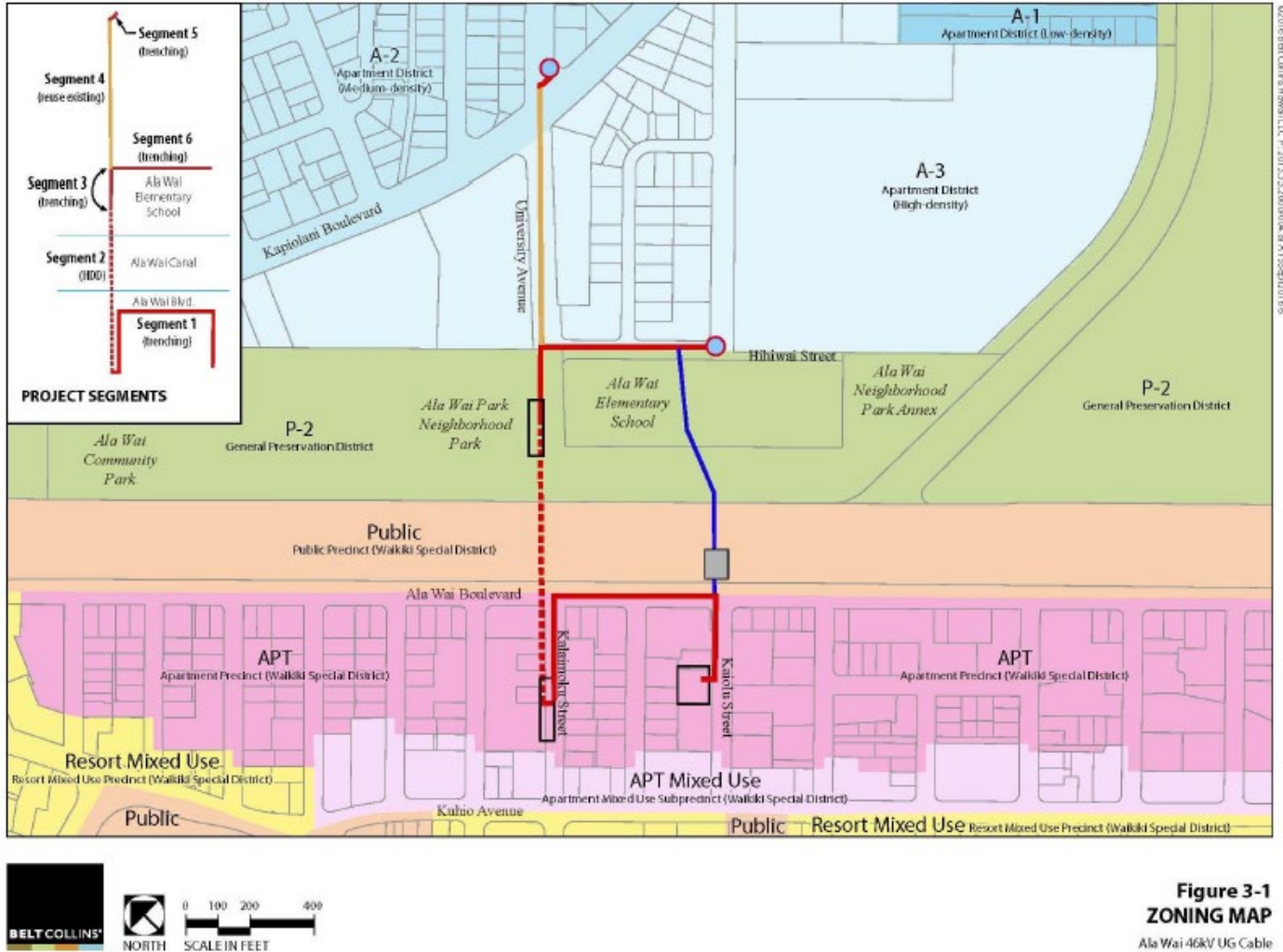


Figure 3-2
UTILITIES PLAN AND PROFILE
Ala Wai 46kV UG Cable

Source: Ala Wai 46kV Underground Cable Relocation, Final Environmental Assessment (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

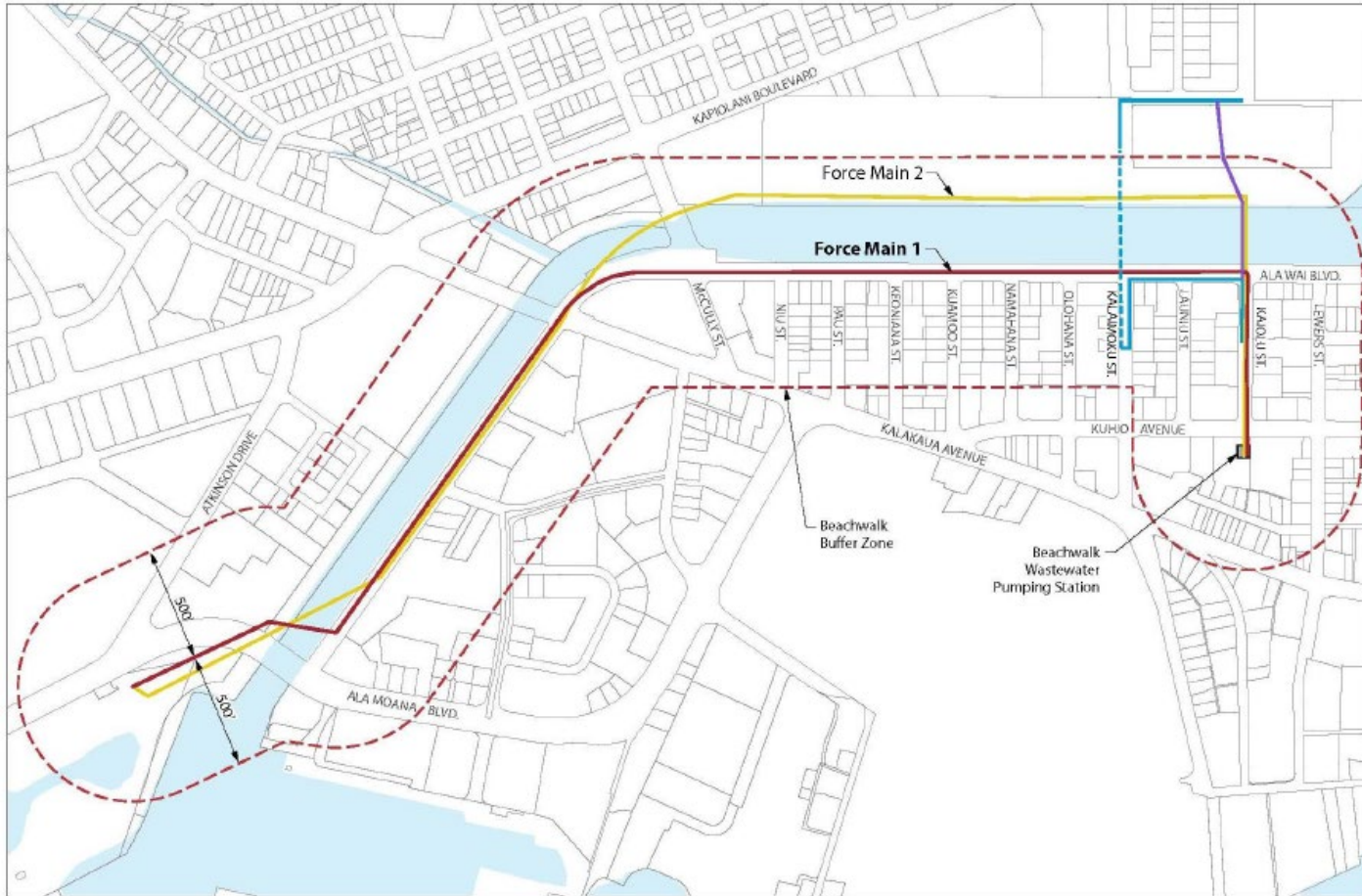
Figure 39 Map of HECO Underground Cable Relocation Alignment, with Land Use Zoning



Source: Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 40 Beachwalk Buffer Zone, Around Force Main 1



©2018 Belt Collins-Hawaii, LLC. P. 2013.31.20000189 v. 1. 7/26/2018



- LEGEND**
- New 46kV Cable (Horizontal Directional Drilling)
 - New 46kV Cable (Trenching)
 - Existing Cable to be removed

Figure 3-3
BEACHWALK BUFFER ZONE
Ala Wai 46kV UG Cable

Source: Ala Wai 46kV Underground Cable Relocation, Final Environmental Assessment (2017)

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES (UTILITIES)

Create a New Crossing

Kālainmoku-University Alignment

With Ala Pono alternatives being largely located in line with the terminus of University Avenue northeast and to Kālainmoku Street to the southwest of the Ala Wai Canal, there are several utilities that need to be taken into account during planning efforts, including the following:

- On the Waikīkī side of the Ala Wai Canal, a 12” waterline, sewage Force Main 1, and an electrical ductline run parallel with Ala Wai Boulevard at the Kālainmoku Street intersection.
- A 24” drain line, a 6-foot by 2.5-foot drainage box culvert, an electrical ductline, and a 12” waterline run parallel with Kālainmoku Street and into (and across in regard to drainage structures) Ala Wai Boulevard.
- Telecommunications, sewer, and gas lines also run in Kālainmoku Street and end before the Kālainmoku Street/Ala Wai Boulevard Intersection with the nearest of the lines coming within 70-feet of the edge of the intersection.
- On the McCully/Mō‘ili‘ili side of the Ala Wai Canal, sewage Force Main 2 runs parallel to the canal.
- A 10-foot by 8-foot drainage box culvert and proposed HECO 46kV cable run parallel to University Avenue with the box culvert discharging into the canal and the HECO cable running to and under the Ala Wai Canal.
- A new crossing will increase impervious surfaces in the vicinity of the Ala Wai, which may lead to run off into the Ala Wai Canal or onto adjacent sidewalks and roadways.

Due to the location of existing telecommunication improvements, it is not anticipated that the Ala Pono Bridge project would impact existing Hawaiian Telcom improvements.

Suggested mitigation measures include:

- ➔ Any electrical requirements for the project for street lights or other uses will need to coordinate improvements with HECO so that they may provide power at the correct location for the project and to determine what impact their new underground cable alignment has on the feasibility of a University Avenue crossing alignment. Any support or connecting structures for the bridge will need to take access to and disturbance of these HECO lines into account. The Environmental Assessment for the HECO underground cable relocation project recommends that no structures be built above the proposed cable alignment, this is supported by HECO’s pre-consultation comments to maintain continuous access more maintenance of their facilities.
- ➔ Any improvements related to the project Ala Pono project will need to comply with the most current rules, design guidelines and permits from HECO, the City and County of Honolulu, State of Hawai‘i and any other vested agencies.
- ➔ Coordination between the Ala Pono project and HECO’s ductline that runs parallel and within with Ala Wai Boulevard Right-of-way will need to be conducted.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

- Honolulu WWS and DDC will need to be engaged to determine if the location of Force Main 1 and 2 impacts the feasibility of any of the proposed Ala Pono alignments.
- The Board of Water Supply will also need to be engaged to determine if Ala Pono alignments would impact the 12” water mains along Ala Wai Boulevard and Kālaïmoku Street. Coordination with BWS is also necessary to ensure that any improvements related to the Ala Pono Bridge including access and support structures will provide proper clearances and access to existing waterlines, and will not negatively impact any existing or proposed Board of Water Supply improvements
- The City and County of Honolulu, Department of Facility Maintenance will need to be engaged to determine if Ala Pono alignments would impact the drainage infrastructure along Kālaïmoku Street (running across Ala Wai Boulevard) as well as drainage infrastructure along University Avenue that discharge into the Ala Wai Canal. Coordination will also ensure any improvements related to the Ala Pono Bridge including access and support structures will provide proper clearances and access to existing drainage structures, and will not negatively impact existing or proposed drainage infrastructure
- An increase in impervious area will need to comply with the most current Rules Relating to Water Quality from the City and County of Honolulu at the time of construction plan review. Depending on the amount of impervious area introduced by the Ala Pono project, stormwater quality and quantity rules may apply and may require that stormwater runoff generated from the project be subject to water quality treatment and BMPs to minimize the environmental impact of the project.
- City and County of Honolulu may require that the receiving body of water (Ala Wai Canal in this case) be shown to have enough capacity to accept additional runoff generated from the project. Typically, this information is provided in a Drainage Report for the project.
- If runoff generated by improvements for the Ala Pono project is collected and discharged, the location and owner of the drainage system where the drainage connection is utilized will determine permitting requirements. Direct discharge into the Ala Wai Canal will require additional permits from the State of Hawai‘i and the United States Army Corps of Engineers.
- Coordination with Hawai‘i Gas will need to be taken to ensure any improvements related to the Ala Pono Bridge including access and support structures will provide proper clearances and access to existing gas lines to ensure the project will not negatively impact existing or proposed gas lines.
- Coordination with Hawaiian Telcom will need to be conducted to ensure any proposed improvements will not negatively impact the existing or proposed Hawaiian Telcom improvements.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts relevant to the alternate crossing alignment as related to utilities are expected to be similar as for the preferred alignment, except that the locations of utility infrastructure may vary slightly for the alternate alignment. It’s possible that one alignment location could have fewer conflicts with utility infrastructure in the vicinity than the other, however, coordination with the appropriate state and county agencies discussed above will help to determine the full extent of impacts and feasibility for each crossing alignment.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, it is unlikely that any surface-level modifications will impact most of the existing or planned utilities in the vicinity of the Ala Wai Canal. The exception are water transmission lines that cross Ala Wai Canal with existing bridges. However, coordination with the appropriate state and county agencies will be conducted throughout the planning process to determine the extent of any impacts to existing utility infrastructure or the need for improvements to the existing utilities.

Suggested mitigation measures include:

- Coordination with BWS Capital Projects Division for all improvements to existing bridges.
- Construction plans should be reviewed by BWS.
- Construction scheduling should be coordinated with BWS.

Do Nothing

Should the alternative of no change be selected, there will be no impact to existing utilities. Other planned utility projects in the vicinity such as the HECO underground cable relocation will continue regardless of the alternative chosen for Ala Pono (further discussion of impacts to planned projects is included in the following section). It is also likely that regular maintenance of existing utility infrastructure will occur at some point in the future, however, these activities will move forward independently of the chosen alternative.

PLANNED PROJECTS NEAR THE ALA WAI CANAL

There are five significant and concurrent construction projects planned for the Ala Wai Canal and locations nearby in the near future (Figure 41). These projects recently underwent city plan review or assessments of potential environmental impacts. These projects include:

- 'Iolani School Expansion
- Hawai'i Department of Land and Natural Resources (DLNR), Ala Wai Canal dredging
- Honolulu Department of Transportation Services (DTS), Complete Streets implementation on Ala Wai Boulevard
- Hawaiian Electric Company (HECO), 46kV underground cable relocation
- United States Army Corps of Engineers (USACE), Ala Wai Canal floodwall

POTENTIAL IMPACTS AND SUGGETED MITIGATION MEASURES (PLANNED PROJECTS)

Create a New Crossing

Kālainmoku-University Alignment

Potential impacts resulting from a new crossing include conflicts with the phasing and construction of various other projects in the vicinity of the proposed crossing alignment at University Avenue. It is not likely that a new crossing will affect the purpose or long-term operations of other known projects in the vicinity, however, the implantation of these projects may occur at a similar time.

Suggested mitigation measures include:

- With multiple construction projects planned for the canal area, organizations leading these efforts should be engaged to assess how potential Ala Pono alignments will interact with these projects during construction and after completion. In addition, it makes sense to coordinate with these organizations in construction efforts to minimize costs, duplication of efforts, and impacts to the surrounding community.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts relevant to the alternate crossing alignment as related to planned projects in the vicinity of the Ala Wai Canal are expected to be similar as for the preferred alignment. It's possible that one alignment location could have fewer conflicts with other projects in the vicinity than the other, however, coordination with organizations overseeing other planned projects will be able to mitigate any impacts from the crossing, as mentioned above.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include conflicts with the implementation of other planned projects in the vicinity of the Ala Wai Canal. While it is unlikely that the proposed enhancements will impact other planned projects, coordination with the organizations overseeing the other planned projects will help to mitigate any impacts to implementation and help to minimize costs, duplication of efforts, and impacts to the surrounding community, as stated above.

Do Nothing

Should the alternative of no change be selected, there will be no impact on other planned projects in the area and their future progress will not be affected.

Ala Pono, an Ala Wai Crossing | Environmental Setting
 City and County of Honolulu

Figure 41 Planned Construction In and Around the Ala Wai Canal



9 ARCHAEOLOGICAL AND CULTURAL RESOURCES

It is important to observe and document any archeological, cultural, and historic properties located within the project area, while evaluating Ala Pono alternatives. A Cultural Impact Assessment (CIA) was prepared by Scientific Consultant Services, Inc. Hawaii (SCS) and LX Gollin Research Hawai'i, LLC for the DLNR Ala Wai Dredging and Improvements EIS in 2016. The CIA provides the cultural and historical context for project area and land in the vicinity of the Ala Wai Canal through research, community consultation, and interviews with cultural experts for the area.

Pre-Contact Historic Period

Initial settlements to the Hawaiian Islands began primarily as coastal settlements on the windward coasts between A.D. 850 and 1100, which eventually spread to the drier, leeward coasts in later periods. The expansion of the population to inland areas didn't occur until much later in the 14th century and into the 16th century. Agricultural development on the windward side of O'ahu was likely to have begun early (AD 1100–1300) during what is known as the Expansion Period (Kirch 1985). Fisheries were included in Waikiki Ahupua'a, supplementing the productive agricultural plots. The Project area is located in the Waikiki Ahupua'a and Waikiki means literally "spouting water" and is said to be named for the swamps (Pukui et al. 1974:223).

Coastal lands such as Waikiki were preferred for residences of *ali'i* (chiefs, royalty, monarchy) as these lands had easily accessible resources such as offshore and onshore fish ponds, the sea with its fishing and surfing (known as the sports of kings), and some of the most extensive and fertile wet taro lands. One of the most extensive terrace areas for taro was the level land between what is now Kalakaua Avenue, Kapi'olani Park, and Mō'ili'ili (Handy 1940). Other agricultural resources necessary for subsistence were located farther inland, but could easily be brought to the *ali'i* residences on the coast from inland plantations. The early economy of Hawai'i was primarily based on agricultural production and the exploitation of marine resources, which emphasized the importance of connections between the coastal areas and upland regions that make up the self-sufficient *ahupua'a* system.

The Pālolo and Mānoa Stream provided an important fresh water source for this area and fresh water ponds (*loko wai*) were formed as the water meandered to the sea. Most of the ponds in Waikiki were *loko pu'uone*, inland ponds with brackish sea water mixed with upland freshwater sources. Eventually, the isolated inland ponds were modified by ancient Hawaiians for agriculture by deepening the ponds, building banks, and constructing *'auwai* (canals) to allow water and small fish to flow in and out. In addition, several access trails were present in the vicinity of the Project area to connect mauka and makai portions of Waikiki, with one of the trails bisecting what is now the Ala Wai Canal. These trails were also used to access Kamehameha I's Kūihelani residence, where the Moana Hotel and Royal Hawaiian Hotel are now located.

Because of the fine beach and rich agricultural lands, the ruling chiefs of Hawai'i also chose this area for the seat of government in very early times (Handy and Handy 1972). The *ali'i nui* (high chief), Mā'ilikūkahi, transferred the government from Waiāluā to Waikiki in the 1400s, thus making it one of the main political and economic centers of O'ahu for the next 400 years and attracted many of O'ahu's chiefs to Waikiki (Kamakau 1991; Kanahele 1995).

The Māhele

Land tenure in Hawai‘i began a dramatic shift in the 1840s with the introduction of private land ownership based on western law. The Māhele of 1848 divided the Hawaiian lands between the king, chiefs, and government and began the implementation of private land ownership through Land Commission Awards and Land Grants. Land Commission Awards were determined based on claims to a right to the land before 1848, which gave owners a Royal Patent of Confirmation. Land Grants on the other hand, were lands purchased from the government.

Based on historic records and maps of the area, there were about 250 claims to land in the Waikīkī Ahupua‘a, many of which were located on the south side of the Mānoa-Pālolo Drainage Canal. While no land claims during the Māhele were made to the area east of the Ala Wai Canal, many Land Commission Awards and Land Grants were made in the area north of the Canal in Mō‘ili‘ili.

Waikīkī and the Construction of the Ala Wai Canal

Waikīkī became the capitol of the Hawaiian Kingdom after Kamehameha I’s conquest of O‘ahu in 1795 until it was moved to Honolulu in 1809. This was in large part due to the opening of Honolulu Harbor, which attracted more westerners than Waikīkī as it was the only sheltered harbor on O‘ahu and gradually became the new center for activities on O‘ahu. Although the shift to Honolulu drew much of the government and foreign activities away from Waikīkī, many *ali‘i* still preferred the area and a small group of foreigners began building more homes along the beach in the 1860s.

The newfound interest in Waikīkī as a suburb of Honolulu led to the development of larger access roads in and out of Waikīkī, followed by the addition of parks and more large homes in the vicinity. However, the development of roads as well as the many houses would prove to be obstacles to the drainage of fresh water flowing through the agricultural plots to the sea. Although Waikīkī continued to support many different types of agriculture throughout the 19th century, including foreign crops like rice and lotus root, the urbanization of Waikīkī and increasing development put additional strain on the natural drainage of the wetlands. Labeled “unsanitary” because of the dammed waters, these changes would lead to the complete destruction of agriculture and aquaculture in Waikīkī in the early 20th century (Nakamura 1979).

By 1896, Act 61 of the Session Laws established the basis for the filling in of low-lying lands and required owners to convert wetlands to dryland if the Board of Health judged these lands to be injurious to the public, or unsanitary. For land owners, failure to take this action or to repay the government for taking on this action on their behalf meant the possibility of losing their land altogether. At this point, existing wetlands and agricultural areas of Waikīkī were determined a hazard to public health as a vector site for mosquitoes carrying malaria and yellow fever. Various reports concluded that the threat to public health would reach epidemic proportions and that land reclamation would both remedy the mosquito problem and outweigh the economic loss of wetland crops by converting them to an asset of new housing tracts (Chan 2006:29). The new narrative for Waikīkī emphasized that reclamation of the land could turn it into an attractive urban environment (Nakamura 1979). Nakamura, however, also states that: “sanitation was merely a cover for ‘reclamation’ and take-over of land from people who could not afford the costs of ‘improvement’...” Many entrepreneurs were already taking advantage of the buying and filling pond fields and fishponds in Waikīkī and selling the land at large profits.

By mid-1920, the Hawaiian government had acquired the acreage necessary to dredge a drainage canal and the dirt acquired from dredging was then sold and used to fill in remaining wetlands in

Waikīkī. Most notably, the Hawaiian Dredging Company owned by Walter Dillingham was awarded the contract for the dredging and also profited from the sale of the dredged materials for fill throughout Waikīkī. During the years it took to dredge the Ala Wai Canal, viable fishponds and agricultural plots were irreparably impacted by its construction, which in turn released more land to be developed and sold (Nakamura 1979). The completion of the Ala Wai Drainage Canal in 1928 finished the draining and filling in of the remaining ponds and irrigated fields in Waikīkī, opening the way to commercial enterprises, including houses and hotels. Only in 1992 was the Ala Wai Canal designated State Site 50-80-14-9757 and placed on the Hawai'i State Register of Historic Places.

Mo'olelo (oral histories) and Wahi Pana (storied places) of Waikīkī

Waikīkī's abundance of water and inland ponds associated it closely to stories of the *mo'ō* god, Kamō'ili'ili and gave the area mauka of Waikīkī the name Mō'ili'ili, which is the name still used today. Another significant water source mauka of Waikīkī is Kumulae Spring (the current location of Willows Restaurant), which is the only remnant of the fresh water ponds to survive until today. Kumulae Spring is the subject of an old legend that tells of a princess who used to bathe in the spring as the cool, clean water in the otherwise arid plain was said to have healing properties and was full of fish. Similarly, the Kānewai pond was said to also have healing powers and is located underground along what is now called King Street.

A number of heiau are also located within Waikīkī, which attests to the importance of the area for ancient Hawaiians. Among the many religious structures in the area, some of the most notable are Mau'oki Heiau, said to have been built by menehune for worship of Lono the god of harvest, as well as Papa'ena Heiau where there was *luakini* (human sacrifice) and Kamehameha was said to have sacrificed his foster son for breaking kapu in 1809.

HISTORIC PROPERTIES

In the USACE's floodwall environmental impact statement, 39 historic sites were identified within the Ala Wai flood basin.

There are two historic sites with immediate proximity to the canal crossing project area, identified in HECO's underground cable relocation environmental assessment:

- **SIHP # 50-80-14-5796: An original wetland surface**, characterized as “agricultural wetland sediments, non-agricultural wetland sediments, peat sediments, pond sediments and pond berms dating from the pre-Contact period to the early 1900s”²⁹ lies 2.9 feet below the surface.
- **SIHP # 50-80-14-9757: The Ala Wai Canal** itself, was constructed approximately between 1921 and 1928 by the Hawaiian Dredging Company, for the purposes of culling mosquito breeding areas, controlling runoff from the Mānoa and Pālolo valleys away from Waikīkī beach, and attracting recreational use.

In pre-consultation comments, the Historic Hawai'i Foundation notes a number of properties in the project area that are eligible for the National Register, including:

²⁹ Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

- **Mānoa-Pālolo Drainage Canal**
- **Kalākaua Avenue Bridge**
- **McCully Street Bridge**
- **Ala Wai Clubhouse** (listed on the Hawai‘i State Register of Historic Places)

According to the CIA prepared for the DLNR Ala Wai Dredging and Improvements EIS, the Ala Wai Canal in its entirety and/or as separate historic properties and Traditional Cultural Properties, is likely to be eligible for inclusion in the NRHP as authorized by the NHPA of 1966 (SCS, 2016). The Mānoa-Pālolo Canal Drainage, constructed in 1935-1936, is eligible for listing on the National/State Register under criteria A and C. In addition, within the construction footprint the Kalākaua Avenue Bridge (constructed in 1929), McCully Street Bridge (constructed in 1959), and Date Street Bridge (constructed in 1937) have been declared eligible for the National/State Register of Historic Places.

ARCHAEOLOGICAL STUDIES

The state Department of Land and Natural Resources reviewed archaeological studies in and around the canal from between 1902 and 2009, in the cultural impact outreach component of its environmental impact statement. Figure 42 provides a map of the focus area for these studies.

Figure 43 summarizes the DLNR’s findings from five studies that will be most pertinent to evaluating Ala Pono alignment options, due to their close proximity to the canal. Based on these studies, archaeological resources have been found within a 0.25-mile radius of the Ala Wai Canal, however not within the alignment of proposed crossing alternatives. All project personnel should be advised that encountering cultural finds, like human remains are possible.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 42 Past Archaeological Research Around the Ala Wai Canal



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Figure 43 Canal Area Archaeological Studies

Study	Location	Type of Study	Results
Neller, 1984;	Waikīkī	Archaeological reporting	Documented human remains identified in the early 1960s. In 1961, a human jawbone and 19th century trash pit was excavated adjacent to Fort DeRussy. In 1963, two human skulls and other human skeletal material were uncovered along Prince Edward Street, and an ancient Hawaiian burial ground encountered during construction of the present-day Outrigger Canoe Club.
Batch & Kawachi, 1989	Ala Wai Golf Course	Archaeological monitoring	Documented human skeletal remains at TMK: (1) 2-7-036:015. The burials representing a minimum of two individuals (State Site 50-80-14-4097) appeared to have undergone previous disturbance during grading activities for the Territorial Fairgrounds. Based on the osteological analysis, both sets of remains were interpreted as pre-Contact.
Pietruszewsky 1992	Queen Liliu'okalani Gardens	Analysis of human remains	Analyzed human remains recovered by Neller. Concluded that the remains of at least nine individuals of Polynesian ancestry had been recovered.
Freeman et al., 2005	Waikīkī	Archaeological inventory survey	Documented historic properties (State Sites 50-80-14-6700, -6701, -6702 and -6703), including auwai, lo'i, fishponds, human burials and prehistoric and historic remnants.
Armstrong & Spear, 2009	Waikīkī	Archeological monitoring	No historic properties or artifacts associated with the pre- or post-Contact Period were encountered.

Note: Two additional studies within the canal area are documented by DLNR (Figure 35): one by Chaffee and Spear (2012) focused on the Ala Wai Golf Course parking facilities, and a second by Hazlett and Spear (2014) focused on the driving range at Ala Wai golf course. Findings from these two studies could not be found through publicly available sources online.

Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

HECO's 2017 environmental assessment noted four other historic properties located within their project's vicinity, underground:

- SIHP # 50-80-14-4890, an inadvertent discovery of a burial of at least one individual
- SIHP #-6680, ponded field sediment
- SIHP #-6407, subsurface cultural layer
- SIHP #-4970, 'auwai.

HECO's assessment did not identify any *iwi kūpuna* (Native Hawaiian burials). However, they acknowledge that *iwi kūpuna* and other cultural resources are potential impacts based on their review into Waikīkī's history and interviews with interested community members.

The DLNR noted in their environmental impact statement that human burials have been found within 492 and 984 feet of the canal.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainmoku-University Alignment

Potential impacts resulting from a new crossing include ground disturbance for the construction of a new crossing, which may uncover archaeological or cultural resources in unstudied areas. The proposed location for the University alignment is not located in an area with known archaeological resources, however, given the proximity of other, known archaeological resources in the vicinity, including human remains, and the extensive settlement history of Waikīkī, there is a possibility of uncovering archaeological resources with the construction of a new crossing. The location of these sites may disqualify potential alignments, or require specific considerations to minimize the impacts of a bridge's siting on valued facets of local heritage.

In addition, construction of a new crossing may disturb an original wetland surface (SIHP: 50-80-14-5796) located 2.9 feet below the existing surface. Archaeological support in evaluation of potential effects to the wetland surface may be warranted.

Suggested mitigation for potential impacts to archaeological and cultural resources include:

- Engagement of archaeological technical support through the design process, to inform the City of potential impacts to resources.
- Informal consultation with the State Historic Preservation Division (SHPD) during the design phase of the project to develop an agreed upon strategy for investigation of resources.
- Should historic, cultural or burial sites or artifacts be uncovered and identified during ground disturbing activities, all construction work will immediately cease and the appropriate agencies notified pursuant to applicable law.
- Should iwi kūpuna (ancestral remains) or Native Hawaiian cultural deposits be identified during ground altering activities, all work will immediately cease and the appropriate agencies, including OHA, will be contacted pursuant to applicable law.
- Any work affecting the walls, stairs, railings and other character-defining features of the historic Ala Wai Canal must comply with the Secretary of the Interior's Standards for Treatment of Historic Properties.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

The potential impacts and suggested mitigations for the alternative alignment are seen to be similar to those for the preferred alignment. The location of the alternative alignment is not exposed to any known archaeological or cultural resources, although still has the potential to uncover resources in the vicinity of the 'Iolani School facilities and the Ala Wai Golf Course.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, Historic Hawai'i Foundation notes that there may be adverse impacts to bridges eligible for the National Register (McCully and Kalākaua). Impacts to historic resources are not expected if the Ala Moana bridge is enhanced.

Suggested mitigation measures include:

- Adherence to HRS 6E and Section 106 of the National Historic Preservation Act.
- Engagement of historic architectural technical support through the design process, to inform the City of potential impacts to resources, and to support in consultation with the State Historic Preservation Division as well as preservation partners, such as the Historic Hawai‘i Foundation.
- Investigation for presence of historic resources eligible for the National Register to confirm Historic Hawai‘i Foundation’s pre-consultation letter.
- Evaluation of proposed alterations or enhancements on the character-defining features of any historic structures.
- Adherence to the Secretary of the Interior’s Standards for Treatment of Historic Properties.
- Resolution of any adverse effects through mitigation and/or Memorandum of Agreement as HRS 6-E and/or Section 106 of the National Historic Preservation Act dictate.
- Any work affecting the walls, stairs, railings and other character-defining features of the historic Ala Wai Canal must comply with the Secretary of the Interior’s Standards for Treatment of Historic Properties.

Do Nothing

Should the alternative of no change be selected, no impacts to cultural or historic resources are anticipated from current use.

10 RECREATION

The Ala Wai Canal and several locations alongside it are popular recreation venues for residents and visitors alike. This section outlines known recreation facilities, events and activities, and prominent local visual resources. This record points to important stakeholders who will need to be engaged throughout this project, to minimize and avoid impacts to these facilities, events, and activities as much as possible.

RECREATION ACTIVITIES

Common recreation and athletic activities taking place in the canal include sightseeing, walking, jogging, biking, canoe paddling, and kayaking. Local clubs and schools' canoe and kayak teams, including Interscholastic League of Honolulu (ILH) teams, regularly use the canal as a practice and event venue. Figure 44 provides a list of popular local events scheduled throughout the year in and around the canal.

Figure 44 Active and Regular Ala Wai Canal Events

Recreational Use or Event	Time Frame	Area Used
Special Events		
Great Hawaiian Rubber Duckie Race	3 rd or 4 th Saturday in March	McCully St. bridge to Hawai'i Convention Center
Sailing		
Regular Races	Fridays, 4 p.m.	Ala Wai Boat Harbor to Honolulu Harbor
Outrigger Canoes		
High school season	November to February	Kapahulu-Waikiki Library to McCully St. bridge
Pre-season races	March to May	Kapahulu-Waikiki Library to McCully St. bridge
Practices	Weekdays, early a.m. and late afternoon, May to August (highest intensity)	Kapahulu-Waikiki Library to McCully St. bridge
Short course regatta season	April to August (ends with State championship in August)	Whole canal for practices, race in ocean
Long course season	August to 2 nd Sunday in October (ends with the Moloka'i to O'ahu race)	Launch and land in canal for open ocean practices and races
Kayaks		
Ocean racing (surf ski) racing	January to May	Open ocean (launch in canal) and canal for practice
Hawai'i Canoe Kayak Team	November to June	Ala Wai Neighborhood Park and length of canal

Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Prospective Ala Pono alignments should be assessed for how they can best support or add to the continued and future success of these activities and events.

RECREATION FACILITIES

In addition to the canal itself, the following are popular public recreation venues alongside the canal:

- Ala Wai Neighborhood Park provides open space and outdoor athletic facilities.
- Ala Wai Community Garden occupies the eastern portion of Ala Wai Neighborhood Park, and includes 154 12'x15' garden plots that neighbors maintain.
- Ala Wai Dog Park is a fenced 0.8 acre dog park, along the canal.
- Ala Wai Community Park borders the Neighborhood Park, and includes additional athletic facilities as well as a community center with public restrooms and showers.
- Ala Wai Boulevard Promenade along the canal and boulevard is popular for walking and jogging, at the north end of the canal.
- Ala Wai Golf Course is an 18-hole public golf course, operated by the City and County.

All six of these venues are located on the mauka side of the canal. Along with the canal, these venues should be considered common destinations in travel analysis performed for the evaluation of crossing alignments.

Representatives from these facilities should be accounted for in community outreach to assess how Ala Pono might impact their activities in and around the canal. In addition, these representatives should be consulted in any preparations for future construction to disseminate construction information, and provide time for event schedule adjustments and proper handling of park fixtures.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainmoku-University Alignment

Potential impacts resulting from a new crossing include:

- Conflicts between some of the community events noted in Figure 44 and the construction of Ala Pono as well as other planned construction projects (Figure 41) may arise and some activities may need to relocate or reschedule. Local clubs' and schools' canoe and kayak teams will encounter times when they may need to temporarily relocate their activity, due to Ala Pono or other project construction. In addition, many informal recreations in the canal area will be impacted by these construction periods.
- The crossing could attract more runners, bikers, skateboarders and other recreational enthusiasts seeking new and scenic routes. Such additional traffic and utilization of public spaces in the area also have the potential to create conflicts with existing uses.
- The crossing could attract more fishing from the canal, and/or new special events or races.

Suggested mitigation measures related to the above include:

- ➔ Consultation with school activity coordinators, canoe or running clubs and community events organizers in the planning and implementation of Ala Pono, and its relationship to existing recreational activities in the area. See also suggested mitigations in Chapter 3.

- Water quality studies and mitigations, together with public education and signage regarding such and the safety of consuming items harvested from the canal should be pursued.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

The potential impacts for the alternative alignment are seen to be similar to those for the preferred alignment. However, the alternative alignment may extend the potential zone of conflicts to the west, further affecting Tolani School facilities and the Ala Wai Golf Course.

Suggested impacts include:

- Coordinate closely with the Department of Enterprise Services to design a golf course landing that is as compatible as possible with the golf course use.
- Consultation with school activity coordinators, canoe or running clubs and community events organizers in the planning and implementation of Ala Pono, and its relationship to existing recreational activities in the area. See also suggested mitigations in Chapter 3.
- Water quality studies and mitigations, together with public education and signage regarding such and the safety of consuming items harvested from the canal should be pursued.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include:

- Conflicts between some of the community events that occur near the mouth of the canal, as noted in Figure 44, during minor construction activities which could produce excess noise or exhaust that may interfere with canal activities. In addition, many informal recreations in the vicinity of the canal may be impacted by these construction periods that could temporarily restrict bike or pedestrian access along the existing bridges.
- The bridge enhancements could attract more runners, bikers, skateboarders and other recreational enthusiasts from the improvements to bike and pedestrian access. Such additional traffic and utilization of public spaces in the area also have the potential to create conflicts with existing uses.

Suggested mitigation measures related to the above include:

- Consultation with school activity coordinators, canoe or running clubs and community events organizers in the planning and implementation of the bridge enhancements.
- Coordination with agencies overseeing other projects in the vicinity of the Ala Wai Canal such as HECO and DLNR to minimize the impacts to recreational uses by multiple projects in the area.

Do Nothing

Should the alternative of no change be selected, recreational activities within and around the Ala Wai will continue at current levels. However, recreational activities will likely be impacted from the implementation of other projects such as DLNR's Ala Wai Dredging and Improvements as well as HECO's Underground Cable Relocation.

11 NATURAL RESOURCES

TOPOGRAPHY, GEOLOGY, AND ASSOCIATED RISKS

Geology, hydrology, and biology are key factors to consider in the siting and design of Ala Pono. Geology and topography consider the shape and stability of the land where Ala Pono may be located. Water and hydrology consider the location and nature of local water resources, one of which – the Ala Wai Canal – is to be crossed by Ala Pono. Biology considers the local flora and fauna, especially any species that are protected, for project staff to be aware in siting and construction.

Topography

The area around the Ala Wai Canal is relatively flat in topography, as illustrated in Figure 45. Land surrounding the Ala Wai Canal ranges from 20 feet above mean sea level (amsl) to 10 feet amsl.

Geology

Dry land around the Ala Wai Canal is composed of volcanic sedimentary deposits.

According to the DLNR, there are three soil types in the Ala Pono project area, with 0% to 3% slopes (Figure 46):³⁰

- **Fill Land (FL):** Land once used for the disposal of dredging, garbage, and old sugar mill waste. This land type is used for urban development and has moderate water holding capacity and extremely fast permeability. Slopes are mixed.
- **Water (W):** These are the water bodies in the project area, including drainage canals and streams. The slope for this land type is 0%.
- **Kawaihāpai clay loam (KLA):** Runoff is slow on this productive soil found along stream banks, and the erosion hazard is no more than slight. Permeability is moderate. The slope for this land type is 0% to 2%.

³⁰ Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

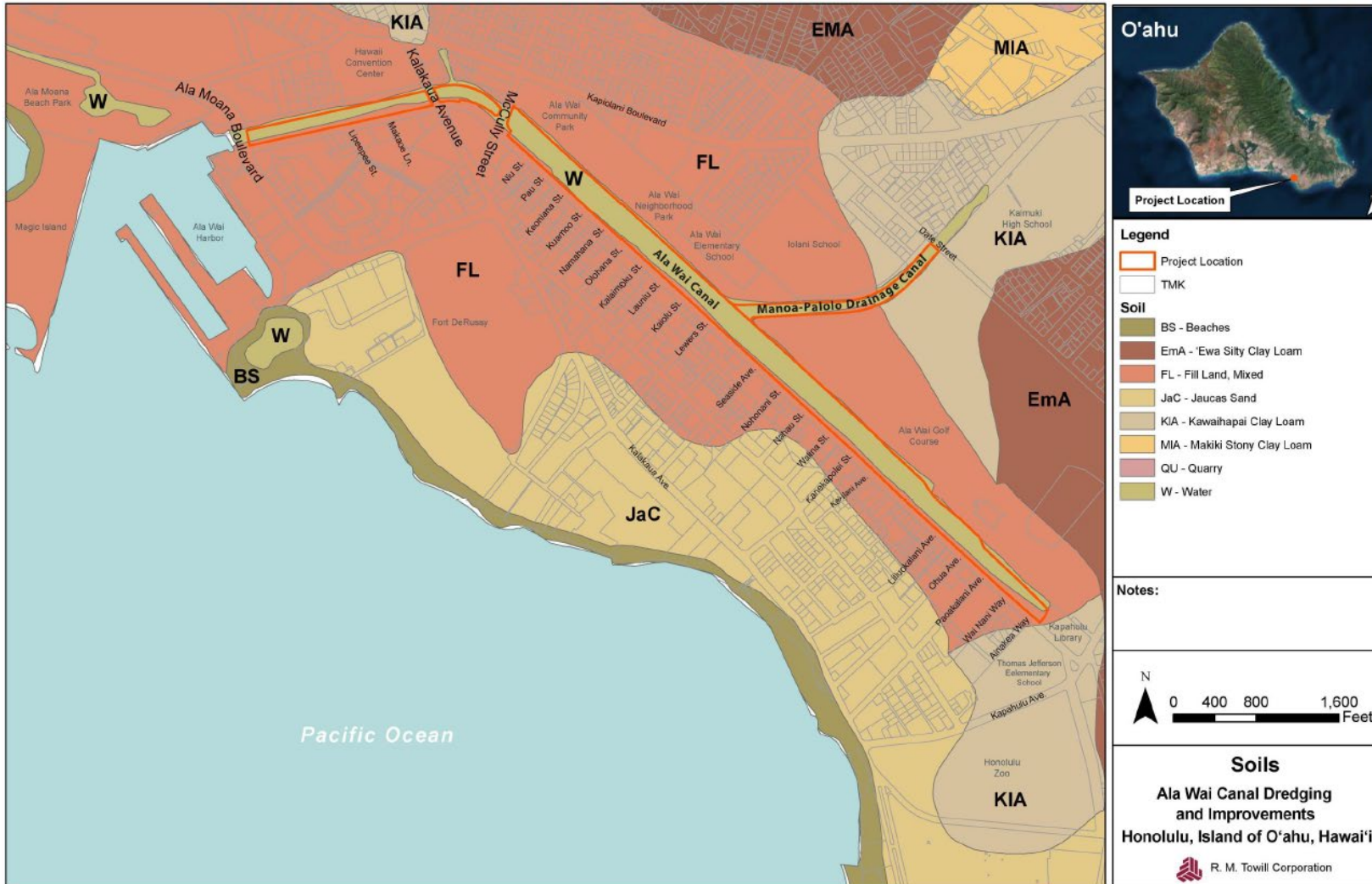
Figure 45 Topography Around the Ala Wai Canal



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 46 Soils Map



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Seismic Activity and Risk

Earthquakes with magnitudes up to 5.0 have been historically documented along the Diamond Head Fault, along the seafloor northeast of O‘ahu.

There is a lower risk for seismic activity on O‘ahu as compared with Hawai‘i Island and Maui, compared with other areas of Hawai‘i (Figure 47).

In 1997, the Uniform Building Code (UBC) upgraded O‘ahu’s seismic risk ranking from 1 to 2A , on a 0-4-point scale, indicating a higher risk of seismicity than had been previously thought.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Potential Impacts resulting from a new crossing include minor ground disturbance where the crossing will connect to each side of the canal. The construction of Ala Pono would not adversely impact the integrity of the canal area’s topography or geology. Topography will not likely be a significant differentiating factor in the relative comparison of alignments, however, it may impact the shape of approaches to the bridge structure.

Crossing construction will disturb the soil in the Ala Pono project area, but any locations disturbed will be restored to their original conditions after construction is finished. Ala Pono will be built in a manner that anticipates user safety in the event of an earthquake. In addition, the development of the Ala Pono crossing will not have any long-term impact on the area’s topography or geology, which has already been highly modified since the completion of the Ala Wai Canal in the late 1920s.

No mitigation is required for a new crossing regarding the impacts to geology or topography. However, construction BMPs will need to be implemented to control fugitive dust, erosion, and runoff during the development of the new crossing. Ala Pono will also need to comply with Uniform Building Code (UBC) regulations, which will be addressed during the final design phase.

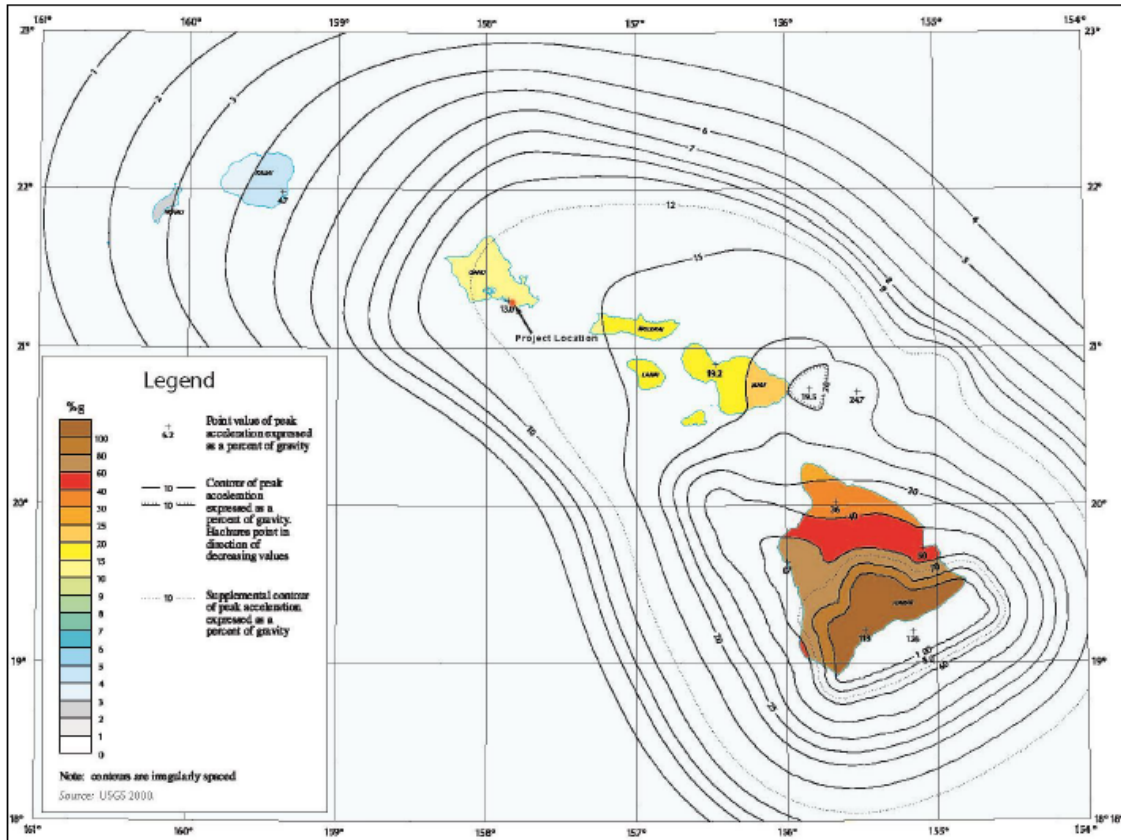
Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include surface level modifications to the existing roadways and/or sidewalks. These modifications will not impact the existing geology or topography of the surrounding area. Assuming no ground disturbance, no mitigation is required for existing bridge modifications regarding impacts to geology or topography.

Do Nothing

Should the alternative of no change be selected, current use of surrounding roadways and sidewalks will continue at current levels. No impacts are anticipated to geology or topography of the surrounding area from existing use. No mitigation measures for the existing use are required regarding geology or topography.

Figure 47 Hawai'i Seismicity Map



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

WATER AND HYDROLOGY

This section briefly describes the history of the Ala Wai Canal, and how it fits within the Ala Wai watershed. This information will provide useful background on the function and orientation of the canal within O‘ahu’s larger water systems.

Surface Water Resources

Ala Wai Watershed

The Ala Wai Canal is part of the Ala Wai watershed, which encompasses approximately 19 square miles (12,064 acres) on the southeastern side of O‘ahu. The watershed extends from the Ko‘olau Mountains to the nearshore waters of Mānala Bay. It includes Makiki, Mānoa, and Pālolo streams, which flow to the Ala Wai Canal.

Ala Wai Canal

Ala Wai Canal is a two-mile long, man-made, unlined drainage channel constructed between 1921 and 1928. The channel was originally dredged to combine the meandering flow of several streams into one straight outlet to the ocean.

The canal width ranges from approximately 150 to 250 feet wide, and is widest between the McCully Street Bridge and the Mānoa-Pālolo Drainage Canal. The canal's average cross-sectional depths range from three to eight feet, with spot depths ranging from one to twelve feet.

The Ala Wai Canal receives inputs from the following sources:

- Mānoa-Pālolo Drainage Canal
- Makiki Stream
- Hausten Ditch
- Kapahulu Drain

Stormwater runoff into the canal comes from five sub-watersheds: Makiki, Mānoa, Pālolo, Ala Wai Canal, and Waikīkī.

Mānoa-Pālolo Drainage Canal

The Mānoa-Pālolo Drainage Canal was built in 1935 and 1936 to realign the Mānoa and Pālolo streams, draining straight into the Ala Wai Canal through one outlet. The drainage canal originates at the confluence of Mānoa and Pālolo streams on the mauka side of Wai'ālae Avenue, flows south to the Ala Wai Canal, and forms the border between the Ala Wai Golf Course and the 'Iolani School campus. Most of the Mānoa-Pālolo Drainage Canal is lined with concrete, however it has a natural bottom opening into the Ala Wai Canal. According to the USACE, the drainage canal's estuarine influence extends from the Ala Wai Canal to approximately halfway between the Date Street and Kapi'olani Boulevard bridges.³¹

Water Quality

Water quality in the Ala Wai Canal is determined by its source waters, which include urban storm drains, nearshore ocean water, groundwater, and streams. The nearest coastal shoreline, Waikīkī Beach, is located approximately 0.65 miles south of the University Avenue/Kālainmoku Street and Kai'olu Street corridors.

The water quality in the Ala Wai Canal today is highlighted by many documented problems related to bacteria, trace metals, nutrients, pesticides, toxic organics, sediment, trash, and debris. Figure 48 provides USACE's findings on the canal's existing water quality conditions.

Sources of pollutants to the Ala Wai Canal are from uses throughout the urban watershed.

Water clarity and quality improvements to the Ala Wai Canal waters are expected as a result of the USACE canal dredging project. Removal of shoal areas would improve water exchange and reduce bacterial concentrations. With greater water depths in the canal, flow velocity would decrease, reducing the total sediment load reaching the ocean. However, circulation improvements will be temporary as sediment loading via storm drains will continue and ocean currents will move sediments creating or re-creating shoals.

³¹ Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

Figure 48 Ala Wai Canal Water Quality Conditions

Water Quality Problems	Conditions
Bacteria	High levels of fecal coliform, enterococcus bacteria and other indicators of fecal pollution (e.g., <i>Clostridium perfringens</i>) have been detected in the Ala Wai Canal and streams, particularly after runoff events. Leptospirosis, a bacterial infection spread primarily through animals (e.g., rats), is another problem in tropical waters; cases in Hawai'i have been reported by people swimming in stream waters. Although no studies have been conducted to determine the degree of threat to public health, a blanket advisory has been issued for all fresh waters in the State.
Trace Metals	Studies on dissolved and particulate trace metals in the Ala Wai Watershed show elevated levels, with ongoing inputs of lead, zinc, copper, barium, and cobalt from urban sources and less significantly, inputs of arsenic, cadmium, and uranium from agricultural sources. Although the lead concentrations have been decreasing since leaded gasoline was phased out, there are still continued inputs believed to be linked to lead-based paint used in older homes and from brake pads and other automotive uses. High levels of copper and zinc also result from heavy use of these substances in automobile brake pads and tires. Road-deposited sediments may also contribute to the elevated concentrations of barium and cobalt in the lower watershed.
Nutrients	Nitrogen and phosphorus concentrations in the streams and Canal have consistently exceeded the State water quality standards. The highest nutrient levels have consistently been reported at the upper end of the Ala Wai Canal (near Kapahulu Avenue), which receives urban runoff from storm drain outfalls; however, high levels have also been documented in forested upper watershed areas (Yim and Dugan, 1975). Sources of nitrogen and phosphorus are soil erosion, animal wastes, fertilizers, automobile exhaust, food wastes, rotting vegetation, sewage, and specifically in the lower canal areas, illicit discharges from boats in the yacht harbor.
Pesticides	The organochlorine compounds dieldrin, chlordane, and heptachlor were used for many decades as pesticides to control termites in Hawai'i, until they were phased out in the 1980s. As these compounds typically have low solubility, they are mostly transported through soil erosion and surface runoff, then accumulate with bottom sediments in the streams and move through the food chain. Because of their widespread use, dieldrin and chlordane have been detected in fish and stream bed sediment samples from Mānoa Stream at concentrations that exceed aquatic life and wildlife protection guidelines. In comparison to other streams sampled across the nation, urban streams on O'ahu (such as Mānoa Stream) had the highest concentrations of chlordane and dieldrin detected. Due to the persistence of dieldrin, soil and stream bed sediments in urban Honolulu serve as a long-term reservoir of dieldrin. Similarly, the valley-fill aquifer that contributes to low flows in Mānoa Stream may also be a persistent reservoir of dieldrin.
Toxic Organics	Toxic organics include such compounds as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), phthalates, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs); these contaminants are commonly associated with products that are prevalent in urban areas, including gasoline compounds, construction materials, plastics, and vehicle exhaust. Similar to organochlorine pesticides, many of these compounds, particularly SVOCs and PCBs, have low solubility and are transported through soil erosion and surface runoff, ultimately moving up the food chain via benthic algae and invertebrates.
Sediment	The Ala Wai Canal generally serves as a sink for the watershed, capturing sediment transported via its tributary streams, a function presumably provided by the former coastal wetlands in this area. Historical accounts reference large quantities of sediment being deposited in the nearshore waters during storm events, as occurs in other steep tropical environments, but the natural background erosion and transport rates are not known. Nevertheless, input of fine sediment is believed to have increased over time because of feral pig wallows and shallow-rooted exotic vegetation in the upper watershed, eroding channel banks, and runoff from adjacent urban areas. Sediment loading

Water Quality Problems	Conditions
	contributes to habitat degradation in the streams and in the nearshore marine environment by smothering substrate, filling interstitial spaces, and harming coral reef communities. Calculations of the sedimentation rate in the Ala Wai Canal over time have been relatively consistent, ranging between approximately 7,000 to 8,000 cubic meters per year (m ³ /year). The most recent dredging effort was conducted in 2002 and 2003, during which approximately 141,440 m ³ of sediment was removed from the Ala Wai Canal and the lower portion of the Mānoa–Pālolo Drainage Canal.

Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

Groundwater

Groundwater accounts for almost 99% of Hawai‘i’s domestic water, and approximately half of all freshwater used in the state.

The Ala Wai watershed area contributes to both the Nu‘uanu Aquifer and the Pālolo Aquifer.

The Honolulu Board of Water Supply (BWS) has established a No-Pass Line on O‘ahu to demarcate the boundary between non-potable brackish and potable fresh groundwater. Groundwater beneath areas that are on the makai side of the line are considered to be of lower value as a drinking water source. The No Pass Line in the Ala Pono project area is the makai side of the Ala Wai Canal.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Potential Impacts resulting from a new crossing include minor ground disturbance at the makai and mauka sides of the Ala Wai Canal where the bridge will be constructed. There is potential for short-term negative water quality impacts in the Ala Wai Canal and Mānoa–Pālolo Drainage Canal where potential future construction of Ala Pono takes place. Significant long-term impacts to water quality and surrounding hydrology are not anticipated from the development a new crossing, although there is potential for runoff from the new crossing to enter the canal.

Mitigation measures to address short-term and long-term impacts include:

- ➔ Construction BMPs to control fugitive dust, erosion, and runoff generated by the construction of the Ala Pono crossing.
- ➔ Coordination of alignment and construction of Ala Pono with the USACE to minimize construction impacts to the canal.
- ➔ Containment of suspended sediment generated from construction with a curtain wall and containment booms.
- ➔ Coordination with the DLNR on construction timing can minimize short- and long-term water quality impacts stemming from construction on a crossing alternative.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include minor surface disturbance during construction, which may allow for fugitive dust, erosion, or runoff to enter the

canal. Long-term impacts to water quality from enhancements to existing bridges is not anticipated as the current type of use by pedestrians, bikes, and cars of the existing bridges will not significantly change.

Mitigation measures to address short-term and impacts include:

- Construction BMPs to control fugitive dust, erosion, and runoff generated by the construction of the Ala Pono crossing.
- Containment of suspended sediment generated from construction with a curtain wall and containment booms.

Do Nothing

Should the alternative of no change be selected, no significant impacts to water quality and the surrounding hydrology are anticipated as a result of continuing the current use. Long-term water clarity and quality improvements are expected as a result of the DLNR's planned canal dredging, regardless of the selected Ala Pono crossing alternative.

BIOLOGICAL RESOURCES

As with cultural and historic properties, it is also important to document biological resources found within the project area. The location of protected species may require specific considerations to minimize the impacts of a bridge's siting.

Flora

Vegetation in the areas around the canal generally occur on land that has been altered or disturbed. The majority of the existing plants are introduced; native plants make up less than 5% of those in the canal area today.

Natural vegetation that would have been found in the project area during the pre-Contact and early post-Contact periods, consisted of coastal marshland species.

Fauna

Given the extent of development around the Ala Wai Canal, fauna found in the project area primarily consist of domestic house pets, such as cat (*Felis catus*) and mongoose (*Herpestes javanicus*), as well as rodents like rats (*Rattus* spp.), and mice (*Mus musculus*). All of these introduced species are detrimental to native ecosystems and native faunal species in the area. Additionally, the Hawaiian hoary bat, is known to roost within trees in the canal area.

There are 18 bird species that have been documented in the project area, and 6 are protected under the Migratory Bird Treaty Act (MBTA); see Figure 49.

There are tree species in the project area where the white tern (*Gygis alba*) are known to roost. The white tern is listed by the State as threatened for the Island of O'ahu.

Figure 49 Bird Species Documented in the Ala Wai Canal Area

Common Name	Scientific Name	Status	Protected by the MBTA	Year Observed
Cattle egret	<i>Bubulcus ibis</i>	NN	X	2013/2016
Common myna	<i>Acridotheres tristis</i>	NN		2013/2016
Common waxbill	<i>Estrilda astrild</i>	NN		2013/2016
Hawaiian duck-mallard hybrids*	<i>Anas</i> sp.	NN	X	2013/2016
House finch	<i>Haemorhous mexicanus</i>	NN	X	2013/2016
House sparrow	<i>Passer domesticus</i>	NN		2013/2016
Hwamei	<i>Garrulax canorus</i>	NN		2013
Japanese white-eye	<i>Zosterops japonicus</i>	NN		2013/2016
Java sparrow	<i>Padda oryzivora</i>	NN		2013
Northern cardinal	<i>Cardinalis cardinalis</i>	NN	X	2013
Pacific golden plover	<i>Pluvialis fulva</i>	N	X	2013/2016
Red-crested cardinal	<i>Paroaria coronata</i>	NN		2013/2016
Red-vented bulbul	<i>Pycnonotus cafer</i>	NN		2013
Red-whiskered bubul	<i>Pycnonotus jocosus</i>	NN		2013/2016
Rock dove	<i>Columba livia</i>	NN		2013/2016
Spotted dove	<i>Streptopelia chinensis</i>	NN		2013/2016
Wandering tattler	<i>Tringa incana</i>	N	X	2013
Zebra dove	<i>Geopelia striata</i>	NN		2013/2016
Total		18	6	

Notes:

N = Native, NN = Non-native permanent resident

* These were observations of ducks that were likely hybrids of the native Hawaiian duck (*Anas wyvilliana*) and the introduced mallard (*Anas platyrhynchos*).

Source: Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

Aquatic Biology

Introduced tilapia (*Oreochromis/Sartherodon*) are the most observed and abundant fish in the project area. Mosquitofish (*Gambusia/Poecilia*), another introduced species, have also been documented in the Ala Wai Canal.³²

Smaller numbers of native marine fishes have been documented in the area, including lai (*Scomberoides lysan*), juvenile giant barracuda (*Sphyraena barracuda*), and a small school of

³² Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

juvenile striped mullets (*Mugil cephalus*). Other fish found within the canal over the past two decades include pāpio (family Carangidae), bonefish or ‘ō‘io (*Abula glossodonta*), and Hawaiian flagtail or āholehole (*Kuhlia sandvicensis*).³³

The fauna of the Ala Wai Canal is largely dominated by introduced vertebrate and invertebrate species. The walls of the canal are covered with barnacles (*Balanus/Chthamalus spp.*), large clumps of the introduced bryozoan (*Zoobotryon verticillatum*), and clumps of the introduced sponge *Suberites zeteki*. The blue claw crab (*Thalamita crenata*), the mangrove crab (*Scylla serrata*), and moon jellies (*Aurelia aurita*), are also found in the canal.³⁴

The benthic zone of the canal has some, but overall few living organisms. HECO reports that recent samples smelled strongly of hydrogen sulfide, indicating anoxic conditions. Of the few living benthic organisms observed, amphipods (order Amphipoda), fireworms (family Amphinomidae), and the native speartail mudgoby (*Oxyurichthys lonchotus*) have been commonly found in the canal.³⁵

Threatened / Endangered Species

Federal- and state-protected species that could potentially occur in the Ala Wai Watershed include those listed in Figure 50. However, much of these listed are not expected to occur within the Ala Pono project area, due to a lack of suitable habitat and/or restricted species distribution.³⁶

Figure 50 Federal/State-Protected Species of Fauna and Flora

Fauna	Flora
Hawaiian hoary bat (<i>Lasiurus cinereus semotus</i>)	haha (<i>Cyanea sp.</i>)
Hawaiian monk seal (<i>Monachus schauinslandi</i>)	Diellia erecta, nanu (<i>Gardenia mannii</i>)
O‘ahu elepaio (<i>Chasiempis sandwichensis ibidis</i>)	Gouania meyenii
Hawaiian coot (<i>Fulica alai</i>)	wawae iole (<i>Huperzia nutans</i>)
Hawaiian stilt (<i>Himantopus mexicanus knudseni</i>)	Lobelia oahuensis
Hawaiian duck (<i>Anas wyvilliana</i>)	Marsilea villosa
Hawaiian moorhen (<i>Gallinula chloropus sandvicensis</i>)	Pteris lidgatei
O‘ahu tree snails (<i>Achatinella sp.</i>)	Schiedea nuttallii
Hawaiian damselflies (<i>Megalagrion sp.</i>)	Spermolepis hawaiiensis
Pacific golden plover (<i>Pluvialis fulva</i>)	
Wandering tattler (<i>Tringa incana</i>)	

Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

³³ Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

³⁴ Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

³⁵ Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

³⁶ Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

The proposed Ala Pono crossing is not expected to adversely impact flora, fauna, or aquatic biology in the project area. The proposed crossing alignments are not within critical habitats and will not significantly alter existing habitats for flora and fauna within the project area.

- Impacts to aquatic species may result from in-water work if sedimentation is not controlled.
- Impacts to seabirds may result from bright night-time lighting (to which they may be attracted, fly toward/around until exhaustion, making them easier prey to dogs, cats, or vulnerable to vehicle strikes)

Suggested mitigation measures:

- Containment of suspended sediment generated from construction with a curtain wall and containment booms to minimize in-water sedimentation (as needed).
- Avoid lighting that shines into the night sky.

Enhance Existing Bridges

Enhancements to existing bridges are not expected to adversely impact flora, fauna, or aquatic biology in the vicinity of these bridges. The bridges are located in highly altered, urban environments, which are not located in critical habitats nor would the design enhancements impact existing habitats in the vicinity.

- Impacts to aquatic species may result from in-water work if sedimentation is not controlled.
- Impacts to seabirds may result from bright night-time lighting (to which they may be attracted, fly toward/around until exhaustion, making them easier prey to dogs, cats, or vulnerable to vehicle strikes)

Suggested mitigation measures:

- Containment of suspended sediment generated from construction with a curtain wall and containment booms to minimize in-water sedimentation (as needed).
- Avoid lighting that shines into the night sky.

Do Nothing

Should the alternative of no change be selected, there would be no impact to flora and fauna in the vicinity of the canal.

AIR QUALITY

While air quality in the vicinity of the Ala Wai Canal is generally good, it can be negatively affected by vehicle emissions from the busy Waikīkī area, and from odors that sometimes emanate from the canal after heavy rains.

Motor vehicles and infrequent motorized boats in the canal are the most significant sources of air pollution in the canal area. There are no major fixed or permanent air pollution generators located near the Ala Wai Canal.

The State Clean Air Branch (CAB) measures air quality from atop the State Department of Health (DOH) building, less than 3 miles west of canal. The CAB measures the six criteria air pollutants regulated by the Environmental Protection Agency (EPA), and an additional air pollutant regulated by the state: Hydrogen Sulfide (H₂S). Figure 51 lists the state and federal standards for these air pollutants.

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainokū-University Alignment

Construction of Ala Pono will involve some ground disturbing activities, including site preparation, excavation, and grading. The operation of heavy equipment and earthmoving will generate internal combustion engine emissions and fugitive dust. The air pollutants from these emissions include hydrocarbons; carbon monoxide; nitrogen, carbon, and sulfur dioxide; and PM₁₀ and PM_{2.5}. The emission of these air pollutants will be temporary and localized in nature. In the context of daily emissions in the canal region, construction emissions will be relatively small, and are not expected to affect attainment of Federal or State ambient air quality standards.

No long-term impacts to air quality are anticipated from the construction of a new crossing. The crossing will only serve bike and pedestrian travel, which will not contribute to any air pollution in the vicinity of the Ala Wai. In addition, a new crossing may have a long-term beneficial effect on local air quality by converting vehicle trips into walking or biking trips (see Section 4).

Suggested mitigation measures for impacts related to air quality include:

Compliance with Hawai'i Administrative Rule (HAR) Title 11 Chapter 60.1 (Air Pollution Control), which requires construction crews use appropriate operational best practices to prevent the discharge of visible fugitive dust beyond property lines.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts and suggested mitigations relevant to the alternate crossing alignment as related to air quality are expected to be substantially the same as for the preferred alignment.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include minor ground disturbance and emissions from construction vehicles. However, any emissions or fugitive dust that result from bridge enhancement activities will be temporary and localized in nature. In the context of daily emissions in the canal region, construction emissions will be relatively small, and are not expected to affect attainment of Federal or State ambient air quality standards.

No long-term impacts are anticipated from enhancements to existing bridges. The enhancements will be planned to improve bike and pedestrian travel over the bridges, which will not increase any air pollutants. In addition, bridge enhancements for bike and pedestrian travel may have a long-term beneficial effect on local air quality by converting vehicle trips into walking or biking trips (see Section 4).

Should construction activities produce any fugitive dust or vehicle emissions, suggested mitigation measures for impacts related to air quality include:

- ➔ Compliance with Hawai'i Administrative Rule (HAR) Title 11 Chapter 60.1 (Air Pollution Control), which requires construction crews use appropriate operational best practices to prevent the discharge of visible fugitive dust beyond property lines.

Do Nothing

Should the alternative of no change be selected, there will be no change to the surrounding air quality. It is likely that the existing air quality will remain in attainment of Federal or State ambient air quality standards.

Figure 51 Air Quality Standards Per Pollutant

Air Pollutant	Averaging Time	Standards		
		Hawai'i State Standard	Federal Primary Standard	Federal Secondary Standard
Carbon Monoxide (CO)	1-hour	9 ppm	35 ppm	-
	8-hour	4.4 ppm	9 ppm	-
Lead (Pb) ¹	3-months	1.5 µg/m ³	1.5 µg/m ³	0.15 µg/m ³
Nitrogen Dioxide (NO ₂)	1-hour ²	-	100 ppb	-
	Annual	0.04 ppm	53 ppb	53 ppb
Ozone (O ₃)	8-hour	0.08 ppm	0.070 ppm	0.070 ppm
PM _{2.5}	24-hour	-	35 µg/m ³	35 µg/m ³
	Annual	-	12 µg/m ³	15 µg/m ³
PM ₁₀	24-hour	150 µg/m ³	150 µg/m ³	150 µg/m ³
	Annual ³	50 µg/m ³	-	-
Sulfur Dioxide (SO ₂)	1-hour ⁴	-	75 ppb	-
	3-hour	0.5 ppm	-	0.5 ppm
	24-hour	0.14 ppm	-	-
	Annual	0.03 ppm	-	-
Hydrogen Sulfide (H ₂ S)	1-hour	0.025 ppm	-	-

Notes:

Source: Clean Air Branch, Department of Health, State of Hawai'i. Updated November 19, 2015. *Federal and State Ambient Air Quality Standards*. Available at: health.hawaii.gov/cab/files/2013/05/naaqs_nov_2015.pdf

ppb = parts per billion by volume

ppm = parts per million by volume

µg/m³ = micrograms per cubic meter of air

1 Due to almost non-detectable levels, ambient air monitoring for lead was discontinued in October 1997 with EPA approval. However, since 2003 lead continues to be measured as part of the Air Toxics monitoring program.

2 Effective January 22, 2010.

3 Due to lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM₁₀ standard effective December 17, 2006. However, the State still has an annual standard.

4 Effective June 2, 2010.

Source: Ala Wai 46kv Underground Cable Relocation, Final Environmental Assessment (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

12 NATURAL HAZARDS AND CLIMATE CHANGE

Ala Pono will need to account for natural hazards in the design of the bridge structure for both general safety and longevity as well as to serve as a potential evacuation route out of Waikīkī. As an island, O‘ahu is particularly susceptible to the impacts of climate change, whether from storms with greater intensities or rising sea levels. The conditions documented in this section can inform investments in an enhanced crossing of the Ala Wai Canal to ensure structures can withstand storm surge flooding, and stand the wear of time with rising sea levels.

SEA LEVEL RISE

In July 2018, Honolulu Mayor Kirk Caldwell signed his Directive on Actions to Address Climate Change and Sea Level Rise (No. 18-01), instructing the City and County to incorporate guidance anticipating sea level rise on O‘ahu. The guidance recommends:^{37,38}

- **Base Sea Level Rise Benchmark:** Set as a planning benchmark up to the 3.2 feet sea level rise exposure area (3.2SLR-XA), as established in the Report, by mid-century as it will be an area experiencing accelerating chronic high tide flooding.
- **Longer Term Sea Level Rise Benchmark:** Set as a planning benchmark up to six feet of global mean sea level rise (6SLR) in the latter decades of this century, especially for critical infrastructure with long expected lifespans and low risk tolerance.

In HECO’s underground cable relocation environmental assessment, forecasts of sea level rise projected one foot of rise by 2050, and three feet by 2100. This data is supported by the analysis of the City and County’s Climate Change Commission, which informed the mayor’s Directive No. 18-01. Figure 52 depicts what land is forecast to be underwater with 3.2 feet of sea level rise.

³⁷ Mayor's Directive No. 18-01: City and County of Honolulu Actions to Address Climate Change and Sea Level Rise.

³⁸ Letter From Climate Change Commission to Mayor and City Council, City and County of Honolulu Climate Change Commission (2018).

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 52 Land Area Change Under 3.2 Feet of Sea Level Rise Conditions



Source: Pacific Islands Ocean Observing System

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Kālainmoku-University Alignment

Potential Impacts resulting from a new crossing include:

- **Exposure to 3.2 ft Sea Level Rise** – As shown in Figure 52, a new crossing at the proposed University Avenue location would be exposed to flooding from sea level rise projections of 3.2 feet. Maintenance dredging activities proposed by the Department of Land and Natural Resources (DLNR) in their Final EIS for the Ala Wai Canal Dredging and Improvements, aim to restore the design drainage capacity of the canal. Although this will address existing conditions it would not address a catastrophic condition involving sea level rise which could have the potential to inundate major portions of Waikīkī and compromise infrastructure facilities such as the Ala Wai Canal (DLNR, 2017).
- **Exposure to High Tide Flooding** – According to the Mayor’s 2018 Directive on Actions to Address Climate Change and Sea Level Rise (No. 18-01), the potential for high tide flooding near O‘ahu’s shoreline is expected to double by mid-century. High tide flooding may impact the area surrounding the Ala Wai Canal through storm drain flooding, which will occur where marine water blocks drainage and spills out onto the street, or where runoff cannot drain and causes flooding around storm drain sites. In addition, groundwater inundation will develop where the water table rises to break the ground surface and creates a wetland.

Suggested mitigation measures regarding impacts from sea level rise include:

- ➔ Based on guidance from Mayor Caldwell’s Directive No. 18-01, the Ala Pono crossing should be designed to remain functional through sea level rise of three to six feet and through potential high tide events, depending on its intended service life through this century.

Seaside-Ala Wai Golf Course-Ala Wai Park Alignment

Potential impacts and suggested mitigations relevant to the alternate crossing alignment as related to sea level rise are expected to be substantially the same as for the preferred alignment.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include:

- ➔ **Exposure to 3.2 ft Sea Level Rise** – As shown in Figure 52, all three existing bridges would be exposed to flooding from sea level rise projections of 3.2 feet. Maintenance dredging activities proposed by the DLNR aim to restore the design drainage capacity of the canal. Although this will address existing conditions it would not address a catastrophic condition involving sea level rise which could have the potential to inundate major portions of Waikīkī and compromise infrastructure facilities such as the Ala Wai Canal (DLNR, 2017). In the scenario of 3.2 feet of sea level rise (see Figure 56), the McCully Street and Kapi‘olani Avenue bridges would be completely flooded, while the Ala

Moana Boulevard bridge would experience less flooding and may still be functional in conditions of 3.2 feet of sea level rise.

- ➔ **Exposure to High Tide Flooding** – According to the Mayor’s 2018 Directive on Actions to Address Climate Change and Sea Level Rise (No. 18-01), the potential for high tide flooding near O’ahu’s shoreline is expected to double by mid-century. High tide flooding may impact the roads and bridges surrounding the Ala Wai Canal through storm drain flooding, which will occur where marine water blocks drainage and spills out onto the street, or where runoff cannot drain and causes flooding around storm drain sites. While it is less likely that the three existing bridges will be flooded from high tide events affecting water levels in the canal, flooding of the surrounding area and roadways may restrict access and use of the bridges during high tide events.

Suggested mitigation measures regarding impacts from sea level rise include:

- ➔ In planning for bridge enhancements, additional analysis may be needed to determine how the enhancements will be designed to remain functional after exposure to increased flooding or high tide events.

Do Nothing

Should the alternative of no change be selected, potential impacts include:

- ➔ **Exposure to 3.2 ft Sea Level Rise** – As shown in Figure 52, the vicinity of the Ala Wai Canal, along with much of Waikīkī, would be exposed to flooding from sea level rise projections of 3.2 feet. Maintenance dredging activities proposed by the DLNR aim to restore the design drainage capacity of the canal. Although this will address existing conditions it would not address a catastrophic condition involving sea level rise which could have the potential to inundate major portions of Waikīkī and compromise infrastructure facilities such as the Ala Wai Canal (DLNR, 2017).
- ➔ **Exposure to High Tide Flooding** – According to the Mayor’s 2018 Directive on Actions to Address Climate Change and Sea Level Rise (No. 18-01), the potential for high tide flooding near O’ahu’s shoreline is expected to double by mid-century. High tide flooding may impact the vicinity the Ala Wai Canal through storm drain flooding, which will occur where marine water blocks drainage and spills out onto the street, or where runoff cannot drain and causes flooding around storm drain sites.

No mitigation is required in the scenario that the no change alternative is selected. However, it is likely that other types of sea level rise mitigation will be implemented for surrounding area in response to other planned projects and future infrastructure maintenance.

LOCAL FLOODING

Hurricane surge flooding is assumed to be likely but minimal in the immediate areas around the Ala Wai Canal, due to the breakwaters and revetments at Ala Wai Boat Harbor near the canal’s mouth.

However, the canal’s floodwalls were overtopped in 1965, 1967, and 1992. The aging floodwalls have therefore been cited as a high risk of local flooding; a condition USACE aims to rectify with its planned floodwall reconstruction project.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

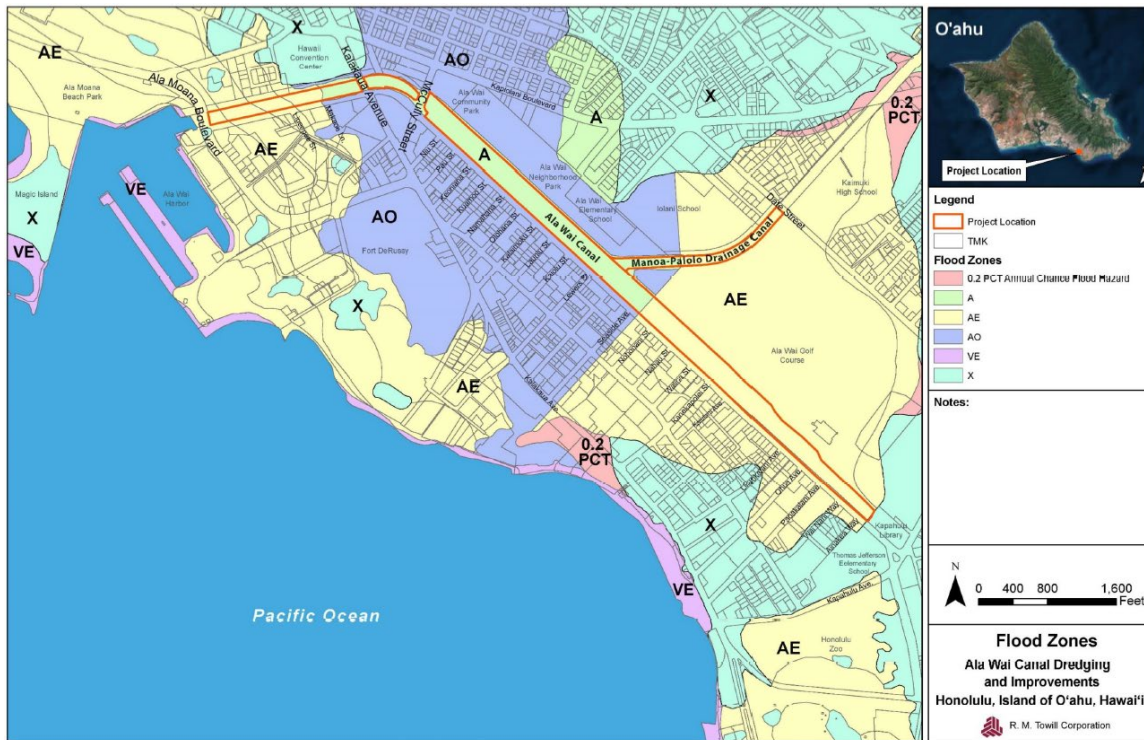
Figure 53 maps flood zones in the canal area, as designated by the Federal Emergency Management Agency, Digital Flood Insurance Rate Map (FEMA, FIRM). The canal area is in flood zones AO, A, AE, and X, which are defined in Figure 54.

Figure 55 and Figure 56 illustrate the areas of inundation in a 1% annual chance flood.

The USACE produced Figure 57 for their planned floodwall reconstruction project. While its construction and footprint area data are not applicable to this effort, its data for inundation area during a flood add some quantitative measure to the places shaded in Figure 55 and Figure 56.

The Ala Pono project area is located in both the Tsunami Evacuation Zone and the Extreme Tsunami Evacuation Zone, according to Figure 58. The former calls for evacuation if a tsunami warning is issued, and the latter calls for evacuation in the event of an extreme tsunami warning. Extreme tsunamis are unlikely, but not impossible.

Figure 53 Flood Zone Map



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 54 **Definitions of Flood Zones Around the Ala Wai Canal**

Flood Zone	Definition
A	Flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods.
AE	Flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods.
AO	Flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) when average depths are between 1 and 3 ft.
X	Area determined to be outside of the 0.2% annual chance floodplain.

Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

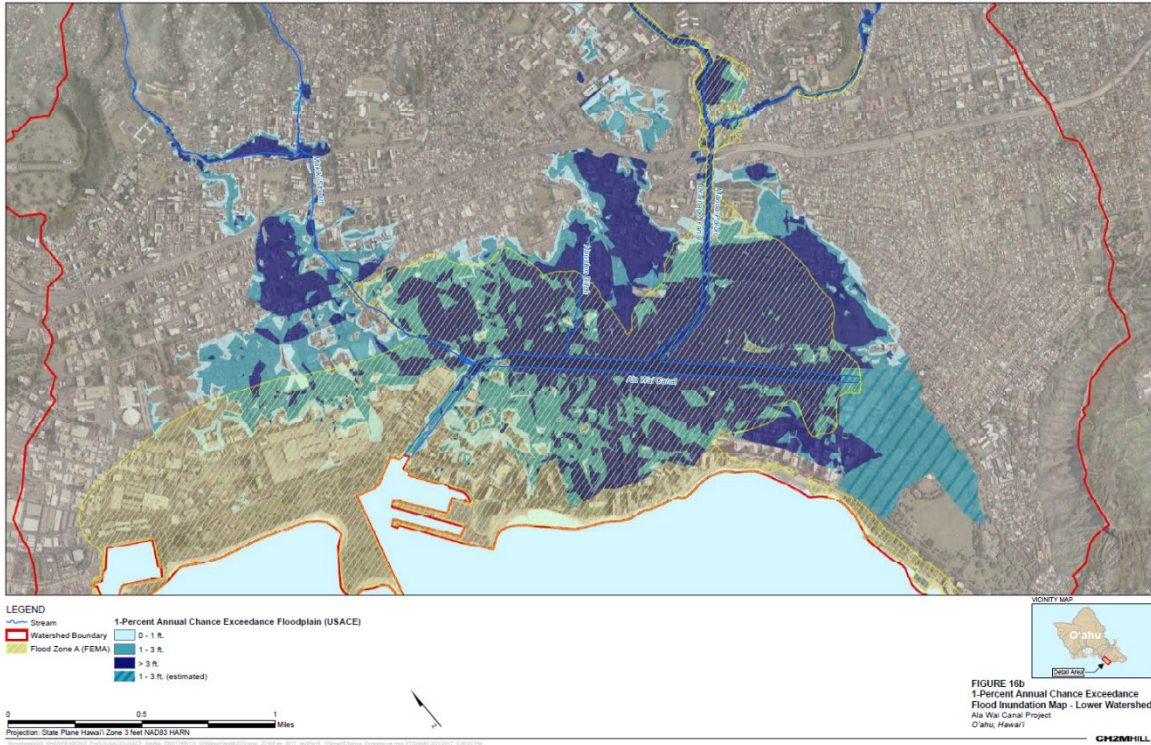
Figure 55 Rendering of 1% Annual Chance Exceedance Flood



Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 56 1% Annual Chance Exceedance Flood Map, By Foot of Flooding



Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

Figure 57 Disturbance Areas During 1% Annual Exceedance Flood

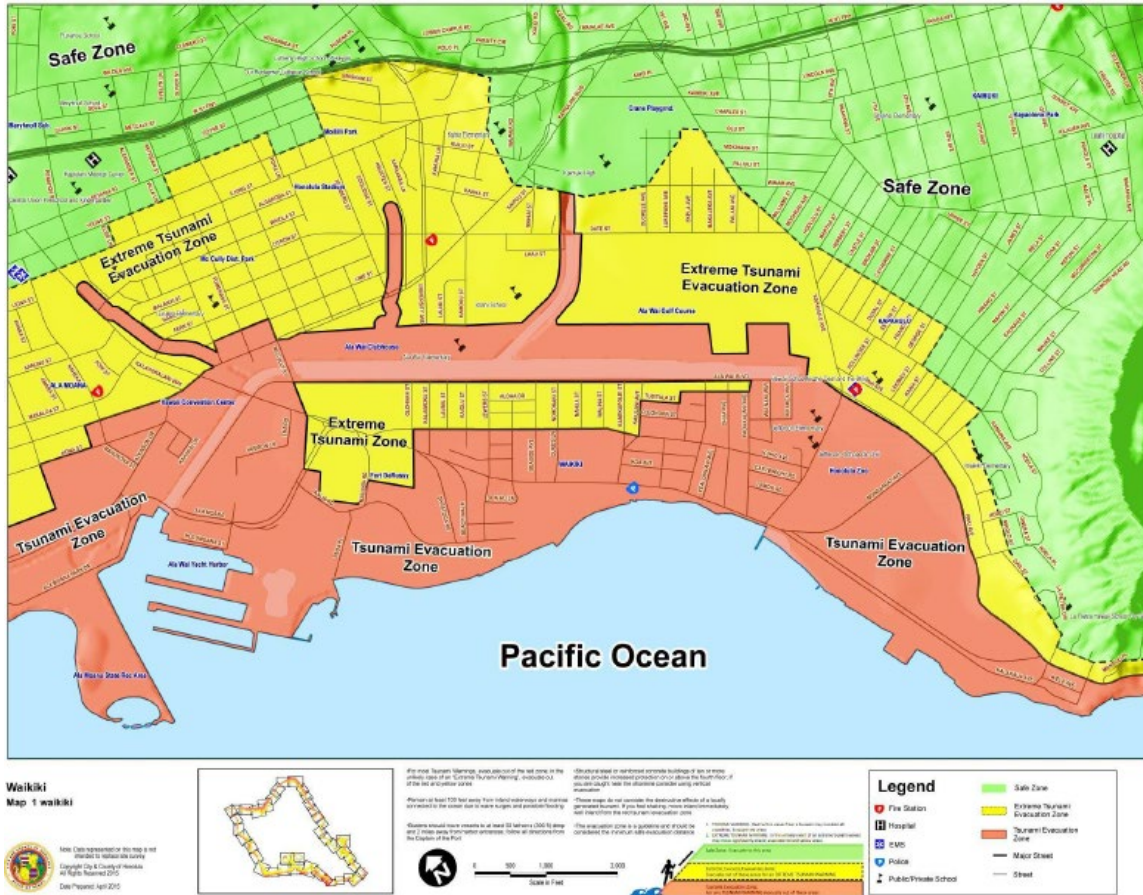
	Total Construction Area (acres)	Permanent Footprint (acres)	Vegetation Management Area for O&M (acres)	Inundation Area During Flood ^a (acres)
Forested Area (Upper Watershed)	9.8	4.1	3.1	8.55
Park Area	33.11	5.1	15.0	142.66
Other Urbanized Area	11.99	0.3	0.11	0
TOTAL	54.88	9.5	18.22	151.11

Note:

^a The inundation area is based on a 1-percent ACE flood event; the maximum duration of flooding for any given site is expected to be no more than 10 hours at any given time.

Source: Ala Wai Canal Flood Risk Management Study, With Integrated Environmental Impact Statement (2017)

Figure 58 Tsunami Evacuation Zone Map



Source: Ala Wai Canal Dredging and Improvements, Draft Environmental Impact Statement (2017)

POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

Create a New Crossing

Potential Impacts resulting from a new crossing include the addition of a potential tsunami or flood evacuation route out of the Waikiki to higher ground mauka of the canal. Local flooding and evacuation zone information can inform which of the proposed canal crossing alignments offer greater relative directness of travel benefits. Figure 59, Figure 60, and Figure 61 illustrate how Waikiki residents and employees can evacuate to the nearest tsunami safe zone safe site with no new crossing, a new crossing at University Avenue, and a new crossing connecting to the Ala Wai Golf Course. Two potential scenarios for impacts to evacuation include:

- The University Avenue Crossing (Figure 60)** – This crossing location would provide an alternative walking/biking evacuation route to approximately 18,300 residents and employers in Waikiki that could reduce evacuation time by approximately 15 minutes compared existing available evacuation routes for walking/biking (see Figure 59). This crossing location would also reduce the number of people crossing at the McCully Street bridge by 60%.

- **The Ala Wai Golf Course crossing** (Figure 61) – This crossing location would provide an alternative walking/biking evacuation route to approximately 9,100 residents and employers in Waikīkī that could reduce evacuation time by approximately 5 minutes compared existing available evacuation routes for walking (see Figure 59). This crossing location would also improve walk times from central and eastern Waikīkī by five minutes each and reduce the number of people crossing at McCully and Kapahulu by 3,700-5,500 people per route.
- The Ala Pono crossing, regardless of the chosen location, would also be exposed to an increasing risk of flooding and extreme weather events over time, which could affect the long-term safety and integrity of the structure if not designed accordingly.
- Due to the more efficient evacuation route, potentially more visitors and other Waikīkī inhabitants seeking refuge at Kūhiō Elementary School, the designated shelter, rather than sheltering in place, potentially resulting in more utilization of this shelter.

Suggested mitigation measures for impacts from flooding and tsunami events include:

- ➔ Structural design that can withstand tsunami events as well as extreme weather events that may increase in intensity over time, including flooding and storm surges.
- ➔ Additional evacuation analysis to determine location and accessibility features of the crossing that will best assist with walking and biking evacuation.
- An important aspect of emergency response planning relative to the Ala Pono alignment is the way proposed alignments could improve walk times from Waikīkī to a tsunami safe site, or increase the number of people that can reach a tsunami safe site with a shorter walk time. Analysis of pedestrian evacuation travel is described in Chapter 12.
 - Additional evacuation routes - More direct evacuation route and shorter non-vehicular evacuation times from central Waikīkī in the event of an emergency, allowing more persons to leave the makai areas more rapidly.
 - Due to the more efficient evacuation route, potentially more visitors and other Waikīkī inhabitants seeking refuge at Kūhiō Elementary School, the designated shelter, rather than sheltering in place, potentially resulting in more utilization of this shelter.
- ➔ Since the Ala Wai Canal itself is within a Tsunami Evacuation Zone area, its design should particularly consider storm and other emergency resilience as well as accommodations for persons with disabilities.
- ➔ The capacity of Kūhiō Elementary to handle potentially higher utilization should be evaluated, as well as the efficacy of bike and walking routes, and wayfinding signage relative to multimodal means of travel to Kūhiō Elementary from the University Avenue landing.

Enhance Existing Bridges

If the alternative to enhance existing bridges is selected, potential impacts include improved evacuation routes for bikes and pedestrians along the existing bridges. As shown in Figure 59, approximately 21,500 people may need to evacuate across the McCully Street bridge. It can be assumed that in the event of an evacuation, this bridge and possibly others as well could be

extremely congested and improved walking and biking transportation along these routes could improve safety and even the time it takes for bikes and pedestrians to reach a tsunami safe zone.

These bridges will also be exposed to an increasing risk of flooding and extreme weather events over time, which may affect the integrity and effectiveness of the modifications over time.

Suggested mitigation measures for impacts from flooding and tsunami events include:

- Design considerations that can withstand more frequent and/or more intense events of flooding and storm surges.

Do Nothing

Under the no new crossing scenario (Figure 59), all Waikīki residents and employees would face a walk time of 45 minutes or longer to reach one of the safe sites on the mauka side of the canal, with approximately 21,500 people crossing the McCully Street bridge, and 13,900 people walking around the canal via Kapahulu Avenue.

Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 59 Pedestrian Evacuation Across Ala Wai Canal, No New Crossing



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 60 Pedestrian Evacuation Across Ala Wai Canal, With Proposed New Crossing at University Avenue



Ala Pono, an Ala Wai Crossing | Environmental Setting
City and County of Honolulu

Figure 61 Pedestrian Evacuation Across Ala Wai Canal, With Proposed New Crossing at the Ala Wai Golf Course



13 REFERENCES

- DLNR. (2017). *Ala Wai Canal Dredging and Improvements, Final Environmental Impact Statement*. Office of Environmental Quality Control.
- DOFAW. (n.d.). *Species of Greatest Conservation Need*. Retrieved from Wildlife Programs: <https://dlnr.hawaii.gov/wildlife/hswap/fact-sheets/>
- HCAP. (n.d.). *Programs*. Retrieved from Honolulu Community Action Program: <https://www.hcapweb.org/our-programs/>
- MCC. (n.d.). *Programs*. Retrieved from Moiliili Community Center: <http://www.moiliilicc.org/>
- Nakagawa, J. (2019, May 9). Coastal Zone Planner. (C. Cullison, Interviewer)
- SCS. (2016). *CULTURAL IMPACT ASSESSMENT FOR THE ALA WAI CANAL DREDGING, WALL REPAIR AND IMPROVEMENTS PROJECT*.
- United States Army Corps of Engineers, Honolulu District. (2019, May 8). *Coastal Zone Management Tables*. Retrieved from Regulatory Mission: https://www.poh.usace.army.mil/Portals/10/docs/factsheets/FINAL_2017%20NWPs%20POH%20401_CZM%20Table%20with%20Conditions__update%202018.pdf?ver=2018-03-16-193633-510
- United States Coast Guard, Office of Bridge Programs. (2016, July). Bridge Permit Application Guide. *COMDTPUB P16591.3D*.
- United States, Council on Environmental Quality. (n.d.). Code of Federal Regulations, Title 40, Parts 1500-1508.
- United States, Federal Highways Administration, Department of Transportation. (n.d.). Code of Federal Regulations Title 23, Part 771, Environmental Impact and Related Procedures.
- United States, National Parks Service. (2019, May 9). 36 CFR Part 59 Land and Water Conservation Fund Program of Assistance to States: Post Completion Compliance Responsibilities. *Federal Code of Regulations*.
- USFWS. (n.d.). *Listed Animals*. Retrieved from Environmental Conservation Online System: <https://ecos.fws.gov/ecpo/reports/ad-hoc-species-report?kingdom=V&kingdom=I&status=E&status=T&status=EmE&status=EmT&status=EXPE&status=EXPN&status=SAE&status=SAT&fcrithab=on&fstatus=on&fspecrule=on&finvpop=on&fgroup=on&header=Listed+Animals>
- USFWS. (n.d.). *Listed Plants*. Retrieved from Environmental Conservation Online System: <https://ecos.fws.gov/ecpo/reports/ad-hoc-species-report?kingdom=P&status=E&status=T&status=EmE&status=EmT&status=EXPE&status=EXPN&status=SAE&status=SAT&fcrithab=on&fstatus=on&fspecrule=on&finvpop=on&fgroup=on&family=on&header=Listed+Plants>
- Waikiki Health. (2018). *2018 Annual Report*. Retrieved from <http://Waikikihc.org/wp-content/uploads/2018-WH-Annual-Report-Web.pdf>

WCC. (2016). *WCC Impact Report*. Retrieved from
<http://www.Waikikicomunitycenter.org/wp-content/uploads/2017/05/WCC-Impact-Report-2016.pdf>

WCC. (n.d.). *What We Do*. Retrieved from Waikīkī Community Center:
<http://www.Waikikicomunitycenter.org/what-we-do/>

Appendix A Plan Review

Over 20 existing plans, policies, and reports were reviewed to document what has already been planned and prioritized for and around the Ala Wai Canal (Figure 67). These documents were produced and/or adopted between 1971 and 2018, by:

- City and County of Honolulu
- Oahu Metropolitan Planning Organization (OahuMPO)
- Hawai'i Department of Land and Natural Resources (DNLR)
- US Army Corps of Engineers (USACE)
- Hawaiian Electric Company (HECO)
- 'Iolani School

The scale and scope of these plans ranges from designs and assessments of planned local construction, to public policy and long range infrastructure planning.

The following table profiles six plans with key local and specific recommendations and identified priorities in the neighborhoods surrounding the Ala Wai Canal. Each of these profiles defines the function of the document and highlights key takeaways pertinent to planning Ala Pono.

Figure 62 Plans with Local Recommendations Related to the Ala Wai Canal

Ala Pono, an Ala Wai Crossing | Document Review
City and County of Honolulu



Advanced Project Planning Report: Ala Wai Canal Bridge (2018)

The APPR is the preliminary evaluation of the Ala Wai Canal study area to identify the potential benefits, impacts, and concerns to the human and natural environment, posed by the prospective Ala Pono crossing. Key takeaways from this report include:

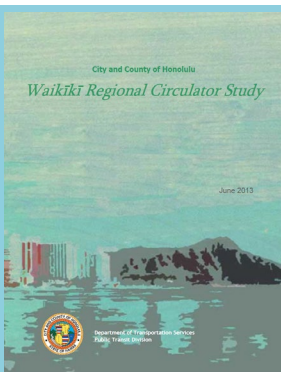
- Identifies the project’s primary purpose as “provid[ing] additional access across the Ala Wai Canal between Ala Moana Boulevard and the Mānoa/Pālolo Stream.
- Recognizes communities adjacent to the Ala Wai Canal for having the highest percentage of non-auto commute share on O’ahu.
- Identifies five alignments to be studied, as were proposed in the Waikīkī Regional Circulator Study.



O’ahu Regional Transportation Plan 2040 (2016)

The ORTP 2040 is a fiscally constrained plan that sets a long-range vision for an improved O’ahu transportation system, and identifies projects to achieve this vision, and revenues to fund them. Consistency with this plan, including the following, is required for projects to be eligible for federal funding. With this in place, the O’ahu MPO Policy Board identified the Ala Wai Pedestrian and Bicycle Safety and Mobility Project as “Priority 1” for federal Transportation Alternatives Program (TAP) funds.

- Regional Objective: “Build a balanced and integrated multi-modal transportation network”
- Regional Objective: “Implement Complete Streets policies and infrastructure improvements where appropriate”
- Regional Objective: “Adapt the surface transportation network to all aspects of climate change”
- Estimates \$12 million to be needed for implementing TAP projects.



Waikīkī Regional Circulator Study (2013)

The WRCS was intended to define a transit service link between the future rail terminus at Ala Moana Center and Waikīkī. It evolved into a neighborhood transportation plan for Waikīkī, McCully, Mō’ili’ili, Kapahulu, and the University of Hawai’i at Mānoa. Key takeaways for the Ala Wai Canal study area include:

- Reports that Waikīkī’s multi-modal transportation system needs better connections across the Ala Wai Canal
- 85% of project public survey respondents said they do not believe the Ala Wai Canal bridges are adequate as pedestrian connections
- 67% of project public survey respondents identified closing the gaps in the pedestrian network as a high priority
- Proposes five prospective alignments for a new or enhanced canal crossing

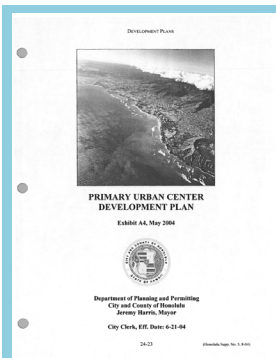
Ala Pono, an Ala Wai Crossing | Document Review
City and County of Honolulu



O'ahu Bike Plan (2012)

The O'ahu Bike Plan guides Honolulu DTS's bikeway planning for the entire island of O'ahu. It is presented as toolkit of design, policy, and program guidance. Key takeaways for the Ala Wai Canal study area include:

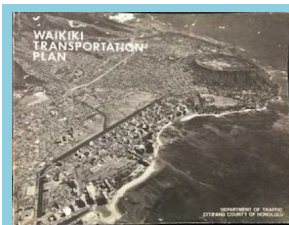
- Envisions O'ahu's bicycle network as being "safe for all types of people and purposes," and specifically including children and older adults.
- Identifies six criteria for prioritizing bikeway projects:
 - Provide continuity within the regional bikeway system
 - Provide the most direct route possible
 - Connect cyclists to desired destinations, such as employment centers, commercial districts, universities, schools, and recreational destinations
 - Provide connections to mass transit, including all of TheBus transit centers and future rail stations
 - Create cross-town and regional facilities that encourage long distance and bicycle commuting opportunities
 - Identify local loop rides that will encourage recreational and neighborhood-based riding



Primary Urban Center Development Plan (2004)

The Primary Urban Center Development Plan is one of eight community plans guiding land use, transportation, and infrastructure policy and investments through the 2025-planning horizon. The Ala Wai Canal is within the Primary Urban Center, which is bounded by Pearl City on the west and Waialae-Kahala on the east. Plan guidelines relating to the Ala Wai Canal study area include:

- Establishing pedestrian districts where walking is intended to be a primary mode of travel, such as within Downtown and Waikīkī.
- Working with residents and school organizations to improve pedestrian safety through planning and education efforts, including the development of traffic management plans, construction of traffic calming devices, and the improvement of neighborhood sidewalks and crosswalks



Waikīkī Transportation Plan (1971)

The City and County's Department of Transportation Services produced a neighborhood transportation plan for Waikīkī in 1971. Planning for an additional bridge crossing the Ala Wai Canal dates back to this plan.

- Suggests extending University Avenue across the Ala Wai Canal to Waikīkī

ADJACENT PLANNED PROJECTS

There are four large scale construction projects moving forward parallel to Ala Pono, planned for the Ala Wai Canal and a neighboring property.

Ala Pono, an Ala Wai Crossing | Document Review
 City and County of Honolulu

- Ala Wai Floodwall Construction
- Ala Wai Canal Maintenance Dredging
- Ala Wai Canal Underground Cable Relocation
- 'Iolani School Campus Expansion

In addition, the City and County is actively planning and implementing several complete streets projects in and around Waikiki. The following map depicts where these projects are taking shape, and who is leading them forward.

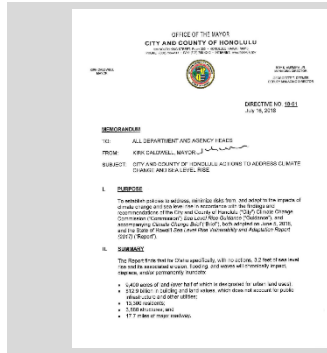
Figure 63 Planned Projects In and Around the Ala Wai Canal



KEY HIGH LEVEL POLICIES

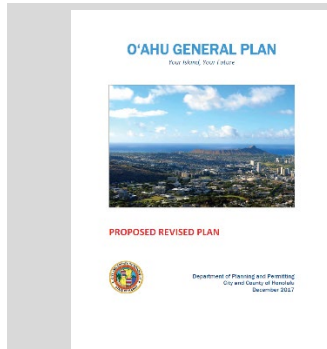
Beyond the six plans previously highlighted, there are four policies and plans that, while not directly centering around the Ala Wai Canal, present key policy and guidance which shape the path of this planning effort.

Figure 64 Key Policies



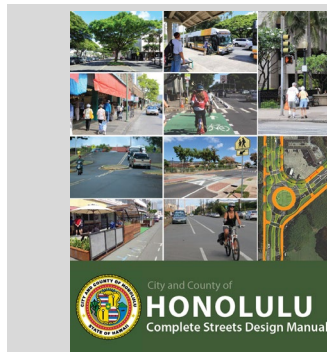
Mayor's Directive No. 18-01: City and County of Honolulu Actions to Address Climate Change and Sea Level Rise
Office of the Mayor (2018)

A directive from the Mayor to City and County agencies to plan and establish policies to minimize risks from, and adapt to the impacts of climate change. Key within this directive's guidance is setting planning benchmarks for 3.2 and 6 feet of sea level rise.



O'ahu General Plan: Proposed Revised Plan
Department of Planning and Permitting (2017)

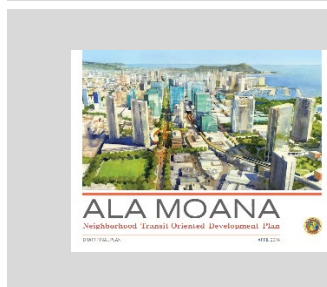
The long range comprehensive plan for the City and County, presents long-term objectives, and supporting policies from 11 policy areas, including transportation and physical development.



Complete Streets Design Manual

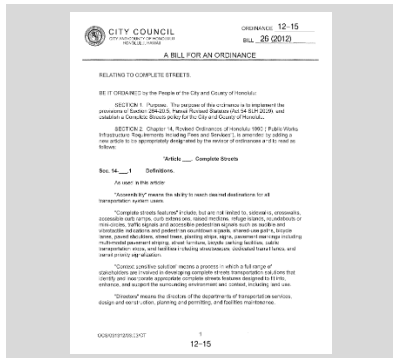
Departments of Transportation Services, Planning and Permitting, Facility Maintenance, and Design and Construction (2016)

This manual provides guidance to plan and design streets, adhering to the Complete Streets policies of the City and County, and the State. This manual applies to all projects impacting the public right-of-way on City and County streets.



Ala Moana Neighborhood Transit-Oriented Development Plan
Department of Planning and Permitting (2016)

This neighborhood TOD plan serves as a guide for future public improvements and developments in the Ala Moana community, in anticipation of the Honolulu Rail Transit Project. The Ala Moana neighborhood is located on the north side of the Ala Wai Canal, at the canal's opening into the Pacific Ocean.



Honolulu Complete Streets Ordinance
City Council (2012)

This ordinance establishes the complete streets policy for the City and County of Honolulu, in implementation of the State's Complete Streets Policy (Act 54 SLH 2009).

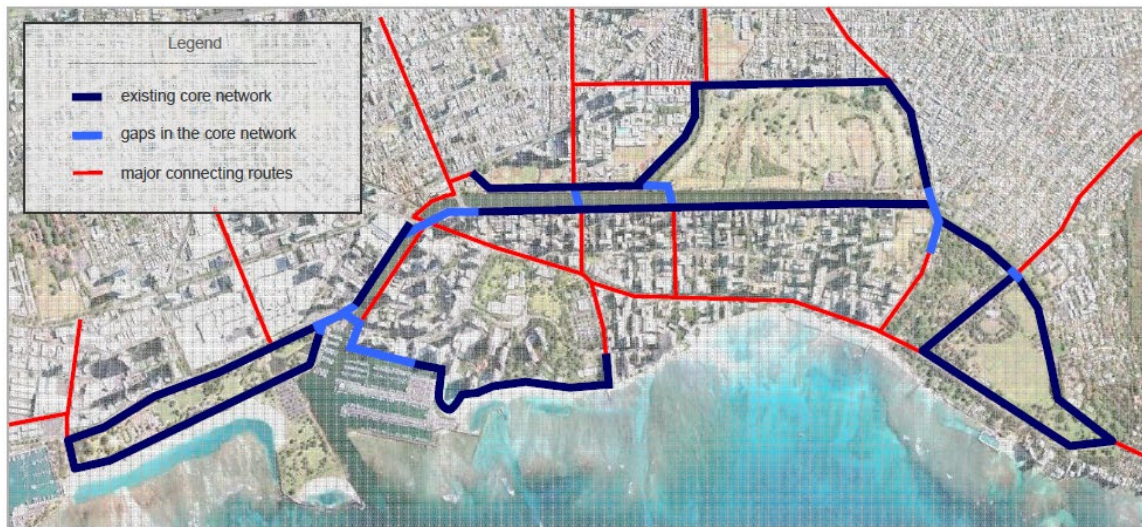
KEY IMAGES FROM EXISTING PLANS

The following pair of images illustrate key parts of the canal's context and narrative.

The pedestrian network map, from the Waikiki Regional Circulator Study, highlights recognized gaps in Waikiki's core pedestrian network. These gaps signal prospective locations for the Ala Pono crossing.

The second map highlights coastal areas projected to be directly impacted by 3.2 feet of sea level rise, based on models forecasting climate change impacts through 2100. While this planning horizon may seem far off, the Mayor's Directive on Actions to Address Climate Change and Sea Level Rise (No. 18-01) instructs the City and County to incorporate guidance which recommends setting a "planning benchmark up to 6 feet of global mean sea level rise (6SLR) in the latter decades of this century, especially for critical infrastructure with long expected lifespans and low risk tolerance."

Figure 65 Waikiki Pedestrian Network Gaps



Source: Waikiki Regional Circulator Study

Ala Pono, an Ala Wai Crossing | Document Review
City and County of Honolulu

Figure 66 Waikīkī 3.2 Ft Sea Level Rise Forecast (2100 Planning Horizon)



Source: Pacific Islands Ocean Observing System

Figure 67 Documents Reviewed

Month	Year	Agency	Plan Title
Jul	2018	City and County of Honolulu: Office of the Mayor	Mayor's Directive No. 18-01: City and County of Honolulu Actions to Address Climate Change and Sea Level Rise
Jul	2018	City and County of Honolulu: Climate Change Commission	Letter From Climate Change Commission to Mayor and City Council
Jun	2018	City and County of Honolulu: Climate Change Commission	Climate Change Brief
Jun	2018	City and County of Honolulu: Climate Change Commission	Sea Level Rise Guidance
Apr	2018	City and County of Honolulu: Department of Transportation Services	Advanced Project Planning Report: Ala Wai Canal Bridge
Mar	2018	City and County of Honolulu: TOD Division	Ala Wai Canal Makai: Vision Study
Dec	2017	City and County of Honolulu: Department of Planning and Permitting	O'ahu General Plan: Proposed Revised Plan
Aug	2017	USACE	Ala Wai Design Renderings
Jun	2017	City and County of Honolulu	General Accessibility Design Guidelines and Policies and Procedures: Curb Ramps within Public Rights-of-Way

Ala Pono, an Ala Wai Crossing | Document Review
City and County of Honolulu

Month	Year	Agency	Plan Title
May	2017	State of Hawai'i, Department of Land and Natural Resources	Draft Environmental Impact Statement: Ala Wai Canal Dredging and Improvements
May	2017	State of Hawai'i, Department of Land and Natural Resources	Draft Environmental Impact Statement: Appendices Ala Wai Canal Dredging and Improvements
Apr	2017	Hawaiian Electric Company	Final Environmental Assessment: Ala Wai 46kv Underground Cable Relocation
Feb	2017	'Iolani School	Application for Conditional Use Permit (Minor): 'Iolani School Campus Expansion
Sep	2016	City and County of Honolulu	Complete Streets Design Manual
Apr	2016	OahuMPO	O'ahu RTP 2040
Apr	2016	City and County of Honolulu	Ala Moana Neighborhood Transit-Oriented Development Plan
	2015	AASHTO	LRFD Guide Specifications for the Design of Pedestrian Bridges (2nd Edition, with 2015 Interim Revisions)
Jun	2013	City and County of Honolulu: Department of Transportation Services	Waikiki Regional Circulator Study
Aug	2012	City and County of Honolulu: Department of Transportation Services	O'ahu Bike Plan: A Bicycle Master Plan
Mar	2012	City and County of Honolulu	Honolulu Complete Streets Ordinance
Jun	2004	City and County of Honolulu: Department of Planning and Permitting	Primary Urban Center Development Plan: Exhibit A4
Oct	2002	City and County of Honolulu: Department of General Planning	General Plan: Objectives and Policies
Dec	1971	City and County of Honolulu: Department of Traffic	Waikiki Transportation Plan