APPENDIX D

PLANNING ADVISORY COMMITTEE (PAC)
MEETING NOTES

MEETING NOTES

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Date/Time:	Wednesday, September 25, 2019; 8:30 a.m.
Location:	Homer Maxey Conference Center 521 Ala Moana Blvd., Honolulu, HI 96813
Purpose:	Planning Advisory Committee (PAC) Meeting #1
Attendees:	See sign-in sheet

- Notes in [bracketed blue text] indicate supplemental information not explicitly discussed during the meeting.
- *Brown italicized text* indicates comments or questions by PAC participants
- Brown regular text indicates a comment or response from the Project Team.

A. Welcome / Introductions

1. Opening remarks from Derek Chow
   a. Hawai'i's harbors are essential facilities for the well-being of our state. We rely on imported goods and services for our survival and almost everything imported comes in through the harbors.
   b. Our harbors are critical to our neighbors in other island communities throughout the Pacific as well. Honolulu Harbor is an essential piece of the Indo-United States Pacific Command (USINDOPACOM) region. We must maintain our harbors so they can function properly to support the strategic role of the USINDOPACOM.
   c. The HHMP will help us to identify how we can best service the shipping industry and maritime community, and to ensure that Honolulu Harbor will continue to operate effectively and meet our needs into the future.
   d. As members of the maritime community, your input is particularly valuable to inform the HHMP about the function, needs and importance of the harbor. This is essentially your plan. We understand how valuable your time is and appreciate your participation in the planning process.

2. Group Introductions [Note: See presentation slides no. 2 through 4 and sign-in sheet.]

B. Meeting Overview (presented by Linda Colburn, Where Talk Works) [Note: Refer to slides 6 through 9.]

1. Meeting Purpose

2. PAC's Role

3. Expected Outcomes for PAC #1

4. Agenda

C. Master Plan Overview and Update (presented by Jim Niermann, RMTC)

1. Planning Process
   a. For the past year and a half, the Project Team has been collecting information through stakeholder interviews and meetings, and conducting studies about harbor operations, infrastructure and future needs.
   b. Through this process, the Project Team has compiled an extensive list of ideas for evaluation. The first step in this process was to sort all of the ideas into two groups: (i) non-Master Plan ideas that could be forwarded to the Department of Transportation, Harbors Division's (DOT-H) Administration, Engineering Program and O'ahu District for further consideration, and (ii) Master Plan ideas that should be evaluated for inclusion in the HHMP. (See discussion below regarding Master Plan Idea Vetting Process.) In today's meeting we are focusing on the group of master plan ideas.
   c. We are now at the beginning of an iterative series of PAC and Public Information Meetings (PIM) to review and refine Master Plan ideas into coherent conceptual alternatives and eventual development of a preferred alternative. This process will take place during 2020 with the objective of being substantially complete by the end of 2020.

2. Planning Principles – the planning process is being guided by the following principles. There were no comments from the PAC participants on the planning principles.
   a. Transparent – Planning analysis, alternatives development, evaluation criteria used for decision-making, and the decision-making process will be documented and open to public review.
   b. Equitable – Project information and opportunities to participate in the planning process will be accessible to all interested stakeholders. In addition, equitable outcomes mean that selected Master Plan alternatives will provide a well-balanced variety of opportunities for harbor users to fairly compete and prosper, and that all stakeholders will be fairly and reasonably included in the Master Plan.
   c. Data-Driven – Alternatives development and recommendations will rely on unbiased, quantifiable outcomes-based data derived from a systematic assessment involving cargo capacity analysis, market

forecast, demand projections and a technical assessment of harbor needs.

d. Consultative – The planning process puts a strong emphasis on consultation with stakeholders who have experience and knowledge about Honolulu Harbor's history, facilities, operations and needs.

3. Mission Statement
   a. The Master Plan priority is on the maritime users: cargo, fishing, passenger and maritime support services, as guided by DOT-H's Mission Statement:

      To effectively improve and manage a commercial harbors system that facilitates safe and efficient operations of commercial cargo, passenger, fishing, and other commercial maritime-related services and support activities within the State of Hawai'i and which serves to sustain and enhance the State's economic prosperity and quality of life.

   b. DOT-H's mandate the emphasis on the needs of the maritime community is at the front of our thinking as we work on the HHMP.

4. Purpose of the Master Plan – the HHMP is being prepared to ensure that the harbor facilities are prepared to handle projected cargo throughput and other operational needs in 2050. [Note: Refer to slide 14.]

5. Goals of the Master Plan – the goals of the Master Plan serve as a foundation for the HHMP ideas evaluation criteria and help ensure that Master Plan outcomes align with DOT-H's mission. [Note: Refer to slide 15.]
   Discussion:
   - There were no comments from the PAC participants on the Master Plan goals.

6. Evaluation Criteria – the following criteria were developed by the Project Team to evaluate ideas for consideration in the Master Plan. The PAC Meeting #1 participants were asked to recommend revisions or additions to the evaluation criteria. [Note: Refer to slides 16 through 20.]
   Discussion:
   - There were no comments from the PAC participants on the HHMP evaluation criteria.

7. Master Plan Idea Vetting Process
   a. Potential HHMP ideas were collected through stakeholder input, Technical Advisory Sub-Committee (Sub-TAC) meetings, DOT-H O'ahu District personnel and the DOT-H Administration. All of the collected ideas are listed in the meeting handout: Master Plan Idea Vetting Process. The complete list of compiled ideas was vetted through the following process:

b. Sift #1:
    1) *Short-Term/Non-Master Plan Ideas* – Ideas that are short-term in nature or not at a "Master Plan" scale were directed to one of DOT-H's programs for evaluation:
        a) *Oʻahu District* – routine, day-to-day maintenance and repair projects.
        b) *Special Maintenance Projects* – engineering projects to maintain existing facilities that do not involve expansion.
        c) *Capital Improvement Plan Projects* – projects involving new construction, expansion or major renovation of existing facilities.
        d) *Administrative Initiatives* – ideas and projects involving policy.
    2) *Master Plan Ideas* – Ideas involving a comprehensive perspective, that have a long-range time frame and require phased implementation, that anticipate outside influences on harbor facilities and operations, and that address future needs and opportunities were identified for further evaluation for inclusion in the HHMP.
c. Sift #2:
    1) Not Further Considered – Ideas that did not meet the HHMP evaluation criteria are not being further considered in the HHMP planning process. These ideas are identified in the handout: *Master Plan Idea Vetting Process*, along with a rationale for their exclusion. PAC participants were invited to comment and recommend reconsideration of these ideas.
    2) For Consideration by the PAC and Project Team – Ideas that met the *evaluation* criteria are the focus of the PAC Meeting #1 presentation and discussion. [Note: In the handout, concepts in blue text are at a level of detail not appropriate for discussion at the first PAC. These concepts will be introduced back into the discussion once the big land use ideas have been decided and individual projects are considered for prioritization.]

Discussion on the Master Plan Overview:

- There were no comments from the PAC participants on the ideas not being further considered in the Master Plan.
- *How has risk management been considered (natural/man-made and cyber/kinetic) and when looking at the effects on the state as a whole?*
    - The HHMP is focused on Honolulu Harbor. DOT is participating in the *Regional Resiliency Assessment Program* (RRAP) study, which will further evaluate the alternate port concept and the reversed hub-and-spoke model and its implications for the state.

D. 2050 Annual Throughput/Estimated Capacity Needs (presented by Harold

Westerman, Stantec)

1. Stantec's Role
    a. Evaluate existing harbor capacity for five types of cargo:
        3) *Containers* – Cargo that is shipped inside standardized shipping containers measured as "Twenty-Foot Equivalent Units" (TEU), which equates to one standard 20-foot long cargo container.
        4) Automobiles (*Autos*) – Measured as individual units that are rolled-on and rolled-off (RO/RO) on vehicle transport vessels under their own power.
        5) *Break-Bulk* – Loose cargo or anything not containerized, typically measured in tons. Break-Bulk cargo is also referred to as *Less-than-Container Load* (LCL) and *Neo-Bulk.* [Note: Neo-Bulk is cargo that is too large or too heavy to fit in a standardized shipping container.]
        6) *Liquid-Bulk* – In Honolulu Harbor, this refers to petroleum products, primarily jet fuel, but also diesel, gasoline, and other refined petroleum products.
        7) *Aggregates* – In Honolulu Harbor, this refers to sand and gravel products. Also referred to as Dry-Bulk. [Note: Dry-Bulk also includes coal and cement products, which are handled at Kalaeloa Barbers Point Harbor, not at Honolulu Harbor.]
    b. Determine future capacity demand based on 2050 throughput projections by SMS Hawaii (SMS).
    c. Identify opportunities to add capacity if needed.
    d. Develop alternatives to meet future throughput demand.

2. Throughput Capacity
    a. *Throughput capacity* is primarily a function of berth capacity and storage capacity, where the most constrained element defines the capacity for the terminal.
        1) *Berth capacity* is the ability to handle cargo on and off the ship, and is a function of berth length, number of cranes and the speed at which cargo can be moved over the berth to or from a ship (i.e., number of container moves per hour);
        2) *Storage capacity* (of the yard) is a function of the amount of yard area, the density of cargo (i.e., ratio of wheeled vs. stacked containers), and how long the cargo is stored in the yard (dwell time); and
        3) *Gate capacity* refers to the capacity for trucks to move cargo into and out of the yard. Usually truck gate capacity is the easiest to remedy and is typically not the determining constraint for a terminal.
    b. Capacity of berth and storage were determined through extensive surveys, interviews and questionnaires completed by operators and

stakeholders. Stantec then analyzed the facilities, their capacity and ability to handle different types of cargo. This data was processed in simulation algorithms to model and estimate current capacity and utilization rates.

3. Review of Existing Capacity vs. 2017 Throughput (slide 27)
   c. Existing capacity, 2017 throughput and percent utilization are presented in the table below. The reason 2017 data instead of 2018 data was used is because the Project Team only had access to the 2017 data during preparation of the analysis. Since then, the 2018 has become available. There isn't a significant difference between the 2017 and 2018 data.
   d. Based on existing capacity without Kapālama Container Terminal (KCT) and 2017 throughput data, Honolulu Harbor is starting to run out of room for containers, with a capacity utilization rate of 84%, but appears to have adequate capacity for the other cargo sectors.

Sector	Unit	Existing Capacity	2017 Throughput	2017 Percent Utilization
Containers	TEU	1,430,000	1,204,200	84%
		1,860,000 (w/KCT)	n/a	n/a
RO/RO (Automobiles)	Units	367,000	177,600	48%
Break-Bulk/Neo-Bulk	Tons	763,000	471,300	62%
Liquid-Bulk*	Bbls	14,490,000	7,071,800	49%
		20,630,000 (w/KCT)	n/a	n/a
Dry-Bulk (Aggregate)*	Tons	500,000	83,300	17%
* Represents berth throughput capacity only.				

4. Existing Capacity vs. 2050 Throughput (slide 28) and Projected Container Throughput and Capacity (slide 29)
   a. By 2050, KCT will be operational and will add approximately 430,000 TEUs of container capacity to Honolulu Harbor. Harbor capacity with KCT and projected 2050 cargo throughput is presented in the table below.

Sector	Unit	Existing Capacity	Annual Throughput Projection 2050	Difference
Containers	TEUs	1,860,000 (w/ KCT)	2,046,000	**-186,000**
RO/RO (Automobiles)	Units	367,000	225,000	+142,000
Liquid Bulk*	Bbls	20,630,000 (w/ KCT)	10,080,000	+10,550,000
Break-Bulk/Neo-Bulk	Tons	763,000	368,000	+395,000
Dry-Bulk (Aggregate)*	Tons	500,000	< 10,000	+500,000

b. The projections indicate that by 2050, with the addition of KCT, Honolulu Harbor will have adequate capacity for all cargo categories except containers. Assuming the cargo terminals will continue to operate as they do currently, with no changes to yard density, dwell times or cargo handling, the projections indicate a container capacity shortfall of 186,000 TEUs (1,860,000 TEU capacity accommodating 2,046,000 throughput), which is approximately 9% of projected 2050 throughput.
c. The *Projected Container Throughput and Capacity* graph on slide 29 shows a baseline (blue line), high (green line), and low (yellow line) projection for future container throughput. Following the baseline projection, Honolulu Harbor will have adequate capacity to handle container throughput until early 2040 with no changes in terminal operations. By early 2040, harbor capacity for container operations will have to be increased to make up the approximately 9% shortfall. This can be accomplished in a number of ways, such as by increasing yard area, increasing yard density by grounding and stacking containers, reducing dwell times, incorporating use of additional Ship-to-Shore (STS, also known as gantry) cranes or increasing productivity by increasing moves per hour. Making up 9% capacity is not difficult to achieve.

5. 2050 Berth and Storage Needs (slide 30)
   a. In aggregate, Honolulu Harbor's container storage yard capacity is 2,030,000 TEUs/annum or approximately 16,000 TEUs/annum short of the projected throughput in 2050 for the medium scenario. Harbor wide berth capacity is 2,320,000 TEUs. This indicates that Honolulu Harbor is constrained by storage capacity.
   b. Note that this calculation differs from the existing capacity of 1,860,000 TEUs, which is determined based on terminal-by-terminal capacity.

Sector	Unit	Harbor Wide Berth Capacity	Harbor Wide Storage Capacity	Annual Throughput Projection 2050
Containers (w/KCT)	TEUs	2,320,000	**2,030,000**	**2,046,000**
RO/RO Automobiles	Units	655,000	367,000	225,000
Liquid Bulk (w/KCT)*	Bbls	20,630,000	N/A	10,080,000
Break-Bulk/Neo-Bulk	Tons	973,000	873,000	368,000
Dry-Bulk (Aggregate)*	Tons	500,000	810,000	< 10,000

6. Future Container Capacity Scenario (slide 31)
   a. The current plans for KCT show that it will have unbalanced capacity because the berth and the yard projections are quite different. As shown in the table below, if the yard capacity can match the berth capacity, then it would meet the Harbor wide capacity needed by 2050 of 2,046,000 TEUs.

Facility	Throughput Capacity (TEU per annum)	
	Berth	Yard

Existing Harbor	1,430,000	
KCT	770,000	430,000
Future Harbor Capacity	2,200,000	1,860,000

Discussion:

- *What are the percentage increases of throughput each year?*
  - Stantec's job was to determine existing capacity. They estimated that the harbor can handle 1 million TEUs per year. Economic consultants at SMS prepared the projections for the future 2050 throughput needs.
- *Has KCT been included in these numbers?*
  - KCT will be operational in 2024, so the 2050 projection does include KCT; however, the existing capacity and throughput numbers are based on current operations, so KCT is not included in these numbers. We expect that KCT will be able to meet the growing capacity needs until the early 2040s, assuming there are no changes to the existing operations, i.e., no changes to yard density, dwell times, or cargo handling times. Once KCT comes on line and actual operational data becomes available, their numbers will be added to the model.
- *How confident are we on the projected continued steady growth of Hawai'i as represented in slide 29?*
  - The yellow, green, and blue lines on slide 29 graph offer a reasonable range, and the Planning Team is very confident that the numbers will fall within that range, as represented by the blue line. This is the best projection we can determine based on the available data.
- *This cargo distribution is based on the hub-and-spoke concept, but as populations shift to Neighbor Islands, we may change the hub-and spoke-model by bringing more cargo directly to Neighbor Islands which could also affect the projections.*
- *Can KCT alter its storage capacity to increase its overall capacity and better support the harbor?*
  - Yes, KCT will have a lower density when it first opens and as volume grows, measures can be taken to expand its capacity.

E. Berth Utilization & Analysis (presented by Jim Niermann, RMTC)

1. Current Berth Utilization (slide 34)

a. Berthing utilization analysis uses eCIDS data from DOT-H for Fiscal Year (FY) 2017 and FY 2018 to determine utilization based on annual berth foot days (BFD). BFD is a function of the vessel length and its duration at a specific berth as a percentage of the berth length multiplied by 365 days in a year.
b. Berth utilization forecasts are based on Hawaii Department of Business, Economic Development and Tourism (DBEDT) average annual Gross State Product (GSP) growth projections of 1.7% to 2050. We recognize that this is an imperfect analysis, however it gives us an indication of berth conditions in the harbor and validates reports from the maritime operators about berth congestion and the need for more berthing.
c. For discussion purposes, the following utilization categories are used in the presentation:
    1) ≤ 30% - Indicates that the pier has capacity and is operating without conflict.
    2) 31 to 50% - Indicates that the pier is generally operating efficiently but has occasional scheduling conflicts.
    3) ≥ 50% - Indicates that the pier routinely experiences conflicts with vessel scheduling and berthing**.**
d. The 2017-2018 data indicates that in the majority of the harbor berth utilization is below 50%; however, many of the piers are operating at or beyond capacity, particularly the dedicated working piers (fishing fleets, tug row at Pier 22, Pacific Shipyards at Piers 23 and 24, Piers 26 to 28, and the Interisland Cargo Terminal).

2. Future Berth Utilization (slide 35)
    a. Based on the 2050 projection, approximately half of the harbor's piers will be operating above the 50% utilization rate. The utilization rate of specific piers will likely change following the opening of KCT and related movement of container operations from Piers 1 and 2 to KCT, and potential movement of auto shipments from Piers 1 and 2 to Piers 19 and20 and/or Piers 32 and 33. In that scenario, the utilization rate at Piers 1 and 2 could drop below 30%.

3. Layberth Needs (slide 36)
    a. Layberth needs were calculated as follows:
        1) Piers included in the layberth analysis are 1, 2, 9 to 11, 19 and 20, 29 to 34 and 51A. These are the piers that are typically used for general layberth and are not dedicated to a specific use.
        2) The layberth analysis excluded the fishing fleet piers, tug row, the ship yards, excursion vessel piers, University of Hawai'i (UH) Pier 35, Marine Spill Response Corporation (MSRC) Pier 15 and the cargo piers, based on the assumption that those are active, dedicated piers not used for general layberth.

3) A target utilization rate of 30% was used for unscheduled piers, and a target utilization rate of 50% was used for scheduled piers. These utilization rates would generally accommodate both working vessel calls and layberth calls at those piers without conflict.
4) For each of the piers, BFD and additional pier length that would be required to maintain 30 or 50% utilization was calculated through 2050 to determine layberth needs.
5) 650 Linear Feet (LF) of layberth was added to the total future layberth need to make up for the loss of UH Snug Harbor as a result of the KCT improvements.

b. Outcomes of layberth analysis:
1) A total of approximately 2,000 LF of additional layberth will be required by 2050 to maintain the target utilization rates and compensate for the loss of UH Snug Harbor.
2) Additional layberth is required to minimize future layberth scheduling conflicts in the harbor.

BERTH UTILIZATION AT HONOLULU HARBOR BY PIER			Forecasted Lay Berth Need (LF)
	Utilization Rate	Piers	FY 2050
UNSCHEDULED LAYBERTH NEED (LF) =	30%	9, 10, 11, 19, 20, 29, 31, 32, 33, and 34	735
SCHEDULED LAYBERTH NEED (LF) =	50%	1, 2 and 51	536
		Snug Harbor	650
LAYBERTH NEED TOTAL =			1,921

c. Layberth Alternatives (slide 37)
1) The Tyco Pier on Sand Island is the best opportunity for developing new, deep-draft layberth within Honolulu Harbor. With improvements such as additional mooring dolphins, it could add approximately 1,200 LF of layberth. The Tyco Pier would serve only as a waterside berth; no landside pier improvements are being considered. [Note: The Hawaii Department of Land and Natural Resources (DLNR), Division of Aquatic Resources (DAR) is interested in expanding its Sand Island facilities into the area

landside of the Tyco Pier.] DOT-H is currently working with DLNR to bring the existing dolphins under DOT-H's jurisdiction.

2) Miscellaneous existing piers within Honolulu Harbor that aren't dedicated to a specific use may be designated or improved for layberth use. These include Piers 4 to 8, 23, 27DL, 36 and 38. These piers are not suitable for large deep-draft vessels.
3) Areas within Keehi Lagoon may be considered for development for layberth use, including Pier 60, Slipper Island, and the seaplane runway along the makai side of Sand Island. These locations would require substantial improvements to serve as layberth for larger vessels, including dredging, filling and in-water construction of mooring dolphins or other mooring devices.

F. Considerations (slides 39-47 presented by Jim Niermann, RMTC)

1. The following is a summary of various physical, environmental and regulatory conditions that have to be considered in the Master Plan. These represent planning opportunities and constraints. The following discussion is merely an overview and is not a complete list.

2. Land use: Long-Term Leases and Land Agreements
   a. There are several long-term leases and land agreements that extend beyond the HHMP planning horizon of 2050. The HHMP will respect these land use agreements and plan accordingly. They include the Foreign Trade Zone (FTZ), which is established by Executive Order [Note: The FTZ is under the authority of DBEDT], Hawai'i Pacific University's (HPU) campus at Aloha Tower, Toell U.S.A. water bottling plant near Pier 23, Pacific Shipyards International at Piers 23 and 24, UH at Pier 35, and the Fishing Village at Piers 36 to 38.
   b. There are also numerous leases that will expire during the HHMP planning horizon. The HHMP will consider uses in these areas that best serve the needs of Honolulu Harbor and the State.

   Discussion:
   - PAC participants had no comments on this subject.

3. Environmental
   a. The Iwilei District Participating Parties (IDPP) designated soil and groundwater contamination operating unit extends into Honolulu Harbor property in several locations makai of Nimitz Highway. Work activities in those areas will have to be undertaken in accordance with an Environmental Hazard Management Plan to mitigate the release of contaminants.
   b. Many of the structures and sites within Honolulu Harbor property, such as the grain silos at Pier 23, are old and may be contaminated with lead, asbestos, pesticides, petroleum products and other contaminants.

c. Wetlands exist throughout Keehi Lagoon and on Sand Island. Master Plan projects that might affect wetlands will be subject to consultation and approval by relevant resource agencies.
d. Corals exist throughout Honolulu Harbor and in adjoining off-shore areas. A coral transplantation site is designated off the end of the Piers 5 and 6 peninsula for corals relocated due to the construction of KCT. A coral transplantation site is also located at Pier 12. Corals are known to be present in the slipways of Piers 6 to 9 area and elsewhere among the piers in the harbor. Any in-water work resulting from Master Plan recommendations will require Department of the Army (DA) permits, which require benthic surveys, consultation with relevant resource agencies and appropriate mitigation.
e. Seagrass has been mapped in several areas of the harbor, including the main harbor entrance channel, along the Diamond Head end of Sand Island, and off the Piers 4 to 8 area. Seagrass provides a food source and habitat for protected sea turtles. Any in-water work resulting from Master Plan recommendations will require DA permits.

Discussion:

- *There are new federal environmental regulations on in-water cleaning and biofouling mitigation. In-water cleaning will be allowed, but the Hawaii Department of Health (DOH) water quality regulations won't apply. The federal government will regulate; however, the standards for these regulations have not yet been established. This presents an opportunity for the resource agencies and maritime community to take the lead, develop methodologies and set standards for implementing the new regulations.*

4. Tsunami Vulnerable Piers
   a. The *Honolulu Port Analyses for the Hawai'i Tsunami Scenarios* (Martin and Chock, 2017) identified harbor areas that are particularly vulnerable to damage by tsunami. These include areas located more centrally in the interior of the harbor, including Piers 19 to 26, Piers 29 and 30, Pier 35, Piers 39 and 40, and Piers 51 to 53. The risk to these areas results from the return flow of the tsunami water as it retreats from the urban areas mauka of the harbor and carries debris into the harbor. The Piers 1 and 2 area, though they will be impacted, are not identified as among the more vulnerable areas, which suggests support for their designation for improvement as emergency staging/relief piers.

Discussion:

- PAC participants had no comments on this subject.

5. Sea Level Rise (SLR)
   a. The HHMP is adopting the City and County of Honolulu (CCH) recommendation of planning for 3.2 feet of global mean sea level rise by mid-century. The Project Team is aware that this projection is being

constantly updated and that an accelerated increase in SLR is possible. Therefore, among the design principles for the HHMP is the need for flexible design that doesn't preclude future adaptation strategies.

b. KCT will have a design elevation of 10 feet above mean lower low water (MLLW), which will provide a least 6.8 feet of freeboard by 2050 based on SLR of 3.2 feet.

Discussion:

- PAC participants commented on SLR as part of the Adaptation and Resiliency discussion.

6. Historic Resources
   a. There are numerous historic resources throughout Honolulu Harbor. These represent both opportunities to highlight the historic significance of the harbor to Hawai'i, as well as constraints that need to be considered in planning for specific sites.
   b. Burials – There are known burials within Honolulu Harbor property (at the Interisland Cargo Terminal near Pier 39 and at Pier 15), and a high probability of encountering additional burials in other areas around the harbor.
   c. Federal and state registers of historic places (IHP) – Aloha Tower is listed on both the federal and state registers. Irwin Park is listed on the state register.
   d. Over 30 other structures located within Honolulu Harbor property are eligible for listing on the federal and state registers, based on a recent historical architectural reconnaissance level survey prepared for the HHMP. In addition, several structures adjacent to harbor land are also eligible for listing, including the historic Immigration Building, the Pier 4 U.S. Coast Guard (USCG) office, and the Hawaiian Electric (HECO) Downtown Power Plant. Master Plan projects that could directly or indirectly affect historic resources will require consultation and approval by the DLNR, State Historic Preservation Division (SHPD) and appropriate mitigation.

Discussion:

- PAC participants had no comments on this subject.

7. Traffic
   a. For this presentation, traffic conditions are considered constrained if they are operating a level of service (LOS) "D" or worse, or if the turning movements and circulation are constrained. [Note: The traffic conditions presented here are based on observations or traffic studies previously completed for other projects and therefore is not a comprehensive evaluation of traffic conditions to be considered in the HHMP. A traffic study has not yet been conducted specifically for the HHMP.]
   b. Forrest Avenue intersection lacks a left turn into the Piers 1 and 2 area, which limits the Pier 2 Cruise Terminal vehicle circulation to a counter-

clockwise orientation with vehicles entering on Channel Street and exiting on either Forrest Avenue or Channel Street.

c. Channel Street is a T-intersection with full turning movement. Channel Street is subject to vehicle congestion during cruise days, due to bus, taxi and service vehicle queuing, and lacks adequate pedestrian facilities.
d. Richards Street is a one-way street that provides the only left-turn into Aloha Tower Marketplace.
e. Bishop Street – Provides access directly into Aloha Tower Marketplace adjacent to Irwin Park. It is constrained in that it does not offer left-turn access into Aloha Tower Marketplace. Also, due to the wide right-of-way (ROW), multiple lanes of traffic, irregular intersection geometry and heavy traffic, the Bishop Street intersection creates challenges for improving the downtown/harbor connection for pedestrians.
f. Fort Street/Aloha Tower Drive – entry into the Aloha Tower area from Nimitz Highway is constrained as it only provides right-turn movement east-bound, no left-turn west-bound. It offers exit in both east-bound and west-bound directions. It presents an opportunity by offering a narrower right-of-way and less congested intersection for pedestrian crossing.
g. Kukahi Street – is used by industrial maritime traffic going to and from the Piers 18 to 23 area. The exit allows right-turn, east-bound out only. Exiting drivers desiring to go in the ‘Ewa direction must first get onto Nimitz Highway heading east-bound and execute a U-turn on Sumner Street or ‘Awa Street. Also, Kukahi Street lacks a deceleration / queuing lane for inbound vehicles.
h. Pacific Street – is used by industrial maritime traffic going to and from the Piers 23 to 29 area. The exit allows movements in both east and west-bound directions, however limited available storage on the segment of Pacific Street between the east- and west-bound lanes of Nimitz Highway causes west-bound container trucks exiting Pier 29 to queue on Harbor property at the traffic signal during peak traffic periods. Pacific Street current lacks a deceleration / queuing lane for vehicles inbound to Pier 29, which contributes to congestion on Nimitz Highway. [Note: DOT-H and DOT-HWY are currently undertaking a project to construct a new east-bound highway exit lane along the makai side of the Oceantronics building which will provide deceleration and queuing capacity.]
i. The Piers 31 to 33 Intersection – is used by industrial maritime traffic accessing to and from the Piers 30 to 34 area. The exit allows right-turn out only, which requires vehicles heading in the ‘Ewa direction to cross Nimitz Highway to execute a U-turn on Pacific Street, Sumner Street or ‘Awa Street. Also, it lacks a deceleration / queuing lane for inbound vehicles.
j. The Pier 34 Intersection – offers east-bound right-turn in and right-turn out movements only. Drivers exiting this area, and desiring to go in the

'Ewa direction, must first get onto Nimitz Highway heading east-bound and execute a U-turn on Pacific Street, Sumner Street or 'Awa Street. West-bound drivers desiring to enter harbor property at this intersection must bypass Pier 34 and execute a U-turn at Pier 35 or otherwise access Nimitz Highway in the east-bound direction. Also, this intersection lacks a deceleration / queuing lane on Nimitz Highway for inbound vehicles. This intersection was previously considered for redevelopment as a full-movement signalized intersection across Nimitz Highway, however it doesn't meet the DOT-Highway Division spacing requirements from the Alakawa Street intersection.

k. The Pier 35 / Alakawa Street Intersection – provides full turning movements and has an acceptable level of service. There may be opportunities for enhancing this intersection and the adjacent internal road system within Honolulu Harbor property to improve circulation and queuing.
l. The Pier 38 Intersection – provides full turning movements and has an acceptable level of service.
m. Waiakamilo Road / Nimitz Highway Intersection – serves the Interisland Cargo Terminal at Piers 39 to 41. The intersection provides full turning movements; however, queuing for all inbound lanes (Nimitz Highway east- and west-bound, and Waiakamilo Road makai-bound), is inadequate and congested during peak operational hours. The HHMP will consider alternatives for relocating container truck traffic and queuing lanes off the highway and inside Honolulu Harbor property. Traffic at this intersection is LOS "D" or worse in all directions during peak hours.
n. Libby Street and Auiki Street – provides access to the back of the Interisland Cargo Terminal at Piers 39 to41. The intersection is congested with container truck traffic and queuing.
o. Sand Island Access Road and Auiki Street – is a State ROW. It is subject to congestion from container truck traffic and other industrial traffic in Sand Island.
p. Pier 51, and Piers 52 and53 Entrance Driveways – serve container truck traffic entering the Sand Island container terminals from Sand Island Parkway. The Pier 51 entrance is a signalized intersection; the Piers 52 and 53 entrances are unsignalized intersections. These intersections are frequently subject to congestion from queuing truck traffic. The HHMP will consider alternatives to internalizing truck queuing and modifying vehicle circulation to one-way in at Pier 52 and one-way out at Pier 51.

Discussion:

- *Did the traffic study consider the rail stops and pillars going forward? (reiterated via MeetingSift)*
    - We haven't yet considered the future projections of traffic. Our studies were based on existing, not future conditions. [Note: No traffic studies have yet been conducted for the HHMP 2050 itself.

Traffic data presented at the PAC #1 meeting is based on traffic studies previously completed for other projects, field observations and stakeholder input.]

8. Daniel K. Inouye International Airport (HNL) Noise Contour
   a. DOT-Airports Division (DOT-A) established noise mitigation contours around the HNL. The 70 decibel (dB) contour crosses the middle of Honolulu Harbor and includes adjacent areas in Keehi Lagoon. The 70 dB contour restricts residential uses. If uses involving permanent live-aboard vessels are proposed in this area, consultation with DOT-A will be required.

Discussion:

- PAC participants had no comments on this subject.

9. Height Limits/Airspace Considerations
   a. Height limits for land uses in and around the harbor are established by CCH zoning regulations and range between 25 feet and 150 feet above ground level, except for the Aloha Tower Development Corporation (ATDC) area, which has its own height regulations that supercedes the CCH.
   b. There is a 163-foot high above sea level horizontal surface above Honolulu Harbor per Airspace Regulation CFR, Part 77.
   c. A One Engine Inoperative (OEI) departure slope is established over Honolulu Harbor to accommodate commercial aircrafts under emergency conditions. [Note: The exact height of the flight slope is dependent on the operating characteristics of each aircraft and is calculated using a proprietary model used by the airlines.] In addition, a "Thread the Needle OEI" flight path is located over the mauka side of the harbor between the Matson's ship-to-shore (STS, also known as gantry) cranes and the iHeart Radio Tower on Dillingham Boulevard. Proposed uses that involve tall structures or equipment within these slope areas, such as at Piers 1 and 2, will require notifying the US Department of Transportation, Federal Aviation Administration (FAA) through the FAA 7460-1 form. The Airlines Committee of Hawaii (ACH) and DOT-A will be consulted through the notification.

Discussion:

- PAC participants had no comments on this subject.

10. ATDC Special District Land Use Zones
    a. Land use zoning at Aloha Tower, from Piers 5 and 6 to Piers 10 and 11, are established by the ATDC. They include a mix of maritime, office, commercial, park and residential uses.

Discussion:

- PAC participants had no comments on this subject.

G. Break

H. Adaptation and Resiliency (slides 49-55)

1. Plan for 3.2 feet of SLR by 2060. By 2050, the HHMP proposes to raise all terminals (i.e., piers and associated yard areas) to consistent height with 10-foot freeboard (above MLLW), determine priority piers/phasing, plan for flexible design of pier improvements to accommodate future adaptive port improvements. Note that these improvements, particularly pier height, will set a precedent for establishment of statewide standards.
   Discussion:
   - *Why are these projections based on 3.2 feet of sea level rise instead of the 6-foot prediction that the City is using? The City is already looking at 6 feet for critical infrastructure. Should there be agreement between what Harbors is looking at and what the City is doing?*
     - The 3.2-foot figure came from the Hawai'i Sea Level Rise and Vulnerability and Adaptation Report (DLNR, 2017). The plans will include flexible design so that port facilities can adapt to more rapid or higher sea level rise. Incremental and phased improvements will allow for a gradual transition as yard and pier heights are adjusted. Terminal height increases may be tied to threshold-trigger sea level increases.
   - *Probably depends on what future you are designing for in regards to the 6 feet prediction. Since this is planned for 2050, the design is for half of the 6 feet CCH prediction for 2100. This is where the discrepancy is coming from.*
   - *As terminal heights are adjusted, STS crane heights will also increase. FAA will need to be notified about the new crane heights.*
   - *Remember that raised roads act as dikes.*
   - *Would the flood plain be another design criterion or planning factor? U.S. military uses the 500-year flood plain as an entering argument for military construction.*
     - The Project Team will have to consider US Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) flood zones in the HHMP. DOT-H may not have the same regulatory requirement as the military.

2. Pier and Yard Heights - Is the idea of raising pier heights to 10 feet to accommodate projected SLR appropriate? What height should the piers be?
   Discussion:
   - *10 feet above sea level may be appropriate for large cargo vessels. You won't need 10 feet of height for smaller working vessels and fishing boats.*

- *Talk to the operators and find out what vessels they are planning to bring into service.*
- [Note: The following comment was received from a PAC participant after the meeting: It should not be a problem for tug and barge operations if the dock freeboard height is increased to 10 feet. The only concern/suggestion is to install adequate fendering that covers the entire dock face: from the top and extending beyond the bottom of the dock. Preferred fendering for tug and barge operations is similar to the ones installed at Kahului Pier 3. The newer tootsie roll fendering installed in Honolulu Harbor are effective for large vessels, but not ideal for tug and barges. Unlike a tire fendering system, the tootsie rolls do not absorb the shock of a single point load as well as tires when docking or undocking barges. Additionally, tootsie rolls present barge access safety concerns to personnel. When wet from rain or from the dew of early morning hours the curvature of the tootsie roll causes many slips and, in some cases, personnel falling between the dock and barge.]

3. Priority Piers (slide 50) - The HHMP will designate specific piers as emergency staging areas and sites for post-disaster work. Piers 1 and 2 are closest to denser populations and are proposed as priority emergency staging piers. Their proximity to the harbor entrance may reduce debris impact and reduce susceptibility to direct impacts from a tsunami, as identified in the 2017 tsunami study (*Honolulu Port Analyses for the Hawaii Tsunami Scenarios,* 2017, Martin and Chock). Do the following piers make sense to improve to serve as emergency staging piers: Piers 1 and 2, Piers 19 and 20, Pier 29, Piers 31 to 33 and Pier 60?
   Discussion:
   - *No objections. The indicated piers seem acceptable.*
   - *In the event of an emergency, how do you get a vessel of any size to Pier 60? To use Pier 60, the channel depth and width would have to change significantly. Also, there are utilities in the area that need to be considered.* [Note: Existing underwater fuel pipelines cross Keehi Lagoon to get to the fuel farm at Aolele Street.]
     - Depends on conditions afterward. Right now, Pier 60 can handle barge operations and that's about it.

4. Does developing hardened vertical structures in strategic locations around the harbor to pre-stage emergency equipment and supplies make sense? In the event of a storm or tsunami warning, emergency equipment, such as emergency generators and fuel tanks, could be pre-staged in these locations. Are the locations indicated at each major terminal appropriate for development of a hardened structure?
   Discussion:

- *No objections. It's a good idea to stage heavy equipment, including cargo handling equipment and heavy equipment that will be used to clear the piers and harbor following a disaster, in various areas around the harbor because you can't easily transport that equipment. It's generally too large and too heavy to take on public roads.*
- *Roads cannot accommodate the transport of heavy equipment such as forklifts that handle the cargo. The current sites shown are a good starting place. Overhead utilities might constrain the transport of cranes and lifts from terminal to terminal.*

5. Recommended emergency pier improvements for resiliency include strengthening pier apron in the form of heavy-lift pads to support cranes, and ramps for RO/RO and cargo. A number of stakeholders have recommended pavement strength of 1,500 pounds per square foot (psf). What is an appropriate pier deck strength? Is 1,000 psf or 1,500 psf sufficient?
   Discussion:
   - *The deck strength should be determined in design.*

6. Getting power to the piers via a centralized and dedicated source (similar to what is available at HNL) or having a decentralized power source(s). Based on the discussions in the Sub-TAC meetings, the Project Team believes that decentralized power is the best option.
   Discussion:
   - PAC had no objections.

7. Reopen the second harbor entrance at Kalihi Channel to improve harbor resiliency. Two alternatives were presented:
   a. Alternative 1: Movable bridge to accommodate full-size cargo vessels; and
   b. Alternative 2: Fixed bridge with air draft to accommodate tug & barge & fishing vessels.

   Discussion:
   - *Combine the two alternatives: a moveable bridge to accommodate cargo vessels only during emergencies, with an air draft that would permit passage of smaller vessels under normal operations.*
   - *This would require the channel be dredged and maintained to allow passage of cargo ships. Is this feasible when it's hard enough to keep one channel properly dredged right now?*
   - *The Keehi Channel is already a federally-designated travel corridor, so dredging would be relatively easy to do. However, its authorized depth would have to be revised as it is currently authorized at approximately minus 25 feet.*
   - *A lift bridge would benefit the tug and barge operators immensely.*
   - *When is the next time the bridge is due for scheduled maintenance?*

Coordination among State and CCH agencies is critical on issues such as drainage outfalls and road connections. There are 100+ drainage outfalls in the harbor, many of which will need to be elevated as SLR increases. The responsibility for most of the outfalls lies upstream outside of DOT-H's jurisdiction. During the Sub-TAC's there was a suggestion for the State and CCH to cooperate on a Honolulu area regional drainage master plan (RDMP). Does anyone have knowledge about efforts to prepare a RDMP? [Note: Following the PAC #1 meeting, the CCH DPP reported that the CCH is planning to develop a drainage plan for the Iwilei area, but the study boundaries will not address areas makai of Nimitz Highway within the Harbor property.] Are there other master plan issues that require coordination?

Discussion:

- *Relative to raising piers and yards to 10 feet, what are they proposing to raise the roads to? And will that integrate to your piers concept?*
  - We don't know how high DOT Highways Division (DOT-HWY) is planning to raise the roadways. Our understanding is that they're using the 6-foot SLR increase as the basis for planning and that they intend to raise key roads in urban Honolulu.
- *Are there plans for relocating the jet fuel being stored near the harbor because of its potential hazard?*
  - No. Those are private facilities. They're not within DOT-H's jurisdiction.

8. Consider pumping water from the water table to prevent impacts of the rising water table on infrastructure

Discussion:

- PAC participants had no comments.

I. Environment (slides 57-59)

1. Provide space for a joint, shared-use inspection and treatment facility at each major terminal. To clarify, DOT-H would provide the space for the facility, but the inspection agencies would be responsible for development costs.

Discussion:

- *Yes. Shared-use inspection and treatment facilities should be considered in the HHMP. The locations look generally okay.*

2. Provide space for refrigerated inspection facilities at the Interisland Cargo Terminal, to conduct inspections of cold/frozen food products

Discussion:

- *Yes. This idea should be considered in the HHMP.*

3. Develop permanent, landscaped infiltration trenches for dewatering construction projects within the IDPP operating units

Discussion:

- *No objection.*
- *What are you going to do with the soil that you remove from infiltration trenches?*
    - Dispose of according to Federal and State regulations and processes.

4. Other comments on the subject of Environment?

Discussion:

- *New federal biofouling regulations are going into effect by December 2022. Standards have not been established for the regulations, which creates an opportunity for the maritime community to influence implementation of the regulations. The biofouling regulations would affect new technologies for mobile hull cleaning and related waste disposal.*

J. Vessel Operations (slides 62-66)

1. Widen the main entrance channel from 490 to 600 feet. DOT-H has requested the U. S. Army Corps of Engineers (USACE) conduct a feasibility study to look at modifications to navigational features that the HHMP will recommend. This includes widening channels to support safe navigation through the harbor, construct breakwater features to improve resiliency and deepen harbor operational depths to accommodate full ship loads. Stantec will review the 600-foot proposed width based on actual vessel data and needs. Current draft depth is 45 feet.

Discussion:

- *Widening the entrance channel should be considered in the HHMP. Analysis needs to be undertaken to determine the required channel width.*
    - When the USACE conducts its feasibility study, cost-benefit analysis will be prepared to determine the benefits of any proposed improvements to federal features.
- *Seagrass is present on both sides of the main entrance channel.*
- *The State has jurisdiction and dredges the area between the pier face up to the Federal Project Area, while the USACE has jurisdiction of, and dredges within the Federal Project Area. Deeper harbor depths allow ships to be fully loaded. As long as the Jones Act remains in effect, there will be primarily small 3,500 TEU vessels calling the harbor. Expenditures to deepen the harbor would be influenced, in part, by this condition.*
- *Deepening the harbor should only be considered if the shippers think it is a good idea. Input from Matson, Pasha, and other operators should be obtained. There doesn't seem to be a need to deepen the harbor draft based on the vessels that currently call at Honolulu.*

- *Hard to foresee the government approving a deepening of the harbor depth; the expense to do so can't be justified if it only serves to accommodate emergency calls by large cargo vessels crossing the Pacific Ocean.*
- *Regular, routine maintenance dredging needs to be a part of the ongoing plan, rather than deepening the overall harbor depth. Manage the draft that currently exists.*
- *Channel widening will require compliance with applicable regulations and rules administered by the U.S. Fish and Wildlife Service (USFWS).*
- *Consider existing infrastructure of piers in relation to proposed 50-foot depth. Deeping the operational draft may require extensive and costly improvements to the pier structure like pilings or sheet piles to avoid undermining their foundations. It doesn't serve any purpose to deepen the navigational depth of the harbor without also deepening the draft at the pier face.*

2. Consolidate the fishing fleet at Pier 38 and relocate all or a portion of the fishing fleet outside of the harbor.
   Discussion:
   - *The fishing industry doesn't expect to see growth in their sector because of the limited number of fishing permits that is currently allowed and increasing regulations associated with fisheries. It is possible the fleet might even contract in the future. The space they have now is sufficient into the foreseeable future. The fishing fleet can make do with what they have.*
   - *Relocate fishing fleet and shallow draft vessels outside of the deep-draft harbor to a more appropriate place for them. Currently, small vessels often have to wait outside the main harbor entrance as larger vessels are navigating the channel.*
   - *There is insufficient room at Piers 36 to 38 to accommodate the entire fishing fleet. The practice of rafting of vessels will continue under the current arrangement. Consolidation would require densifying the berthing arrangement, including rafting 3, 4 or 5 vessels together. It will create a real problem at Piers 36-37.*
   - *The idea of developing a new fishing marina outside of the harbor is not a bad idea, as it would alleviate some of the harbor traffic, but it shouldn't be considered in the HHMP. It might be worth considering in a later planning effort.*
   - *The idea for opening the Kalihi Channel for fishing vessel traffic is a good one. That would greatly improve navigational conditions for both small vessels and large cargo ships.*

3. Widen Kapālama Channel 50 to 75 feet between Piers 30 and 34.
   Discussion:

- *Why not also take Piers 28 and 29?*
  - The Project Team presumed that those piers would be used only for smaller vessels, and therefore wouldn't present a navigational constraint in the Kapālama Channel.
- *Keep smaller, narrower vessels at Piers 28 and 29 and you achieve your purpose of minimizing navigational constraints in the channel.*
- *Don't create a condition that would require a large vessel to make a wiggle to navigate through the channel.*
- *Keep in mind that landside construction activities could release environmental contaminants into the water by cutting into the IDPP operational unit areas. There's a lot of contamination in that area of the harbor.*
- *Keep this idea for consideration in the HHMP.*

4. Develop new layberth at the following locations: various existing piers (Piers 4 to 8 or Piers 12 and 13), Tyco Pier, 'Ewa side of Sand Island, Pier 60 or Slipper Island in Keehi Lagoon.
   Discussion:
   - *Layberth use at existing piers will have to be considered with the eventual designated uses at those piers.*
   - *Developing new moorings or layberth will involve in-water work and require working through environmental regulations.*

5. Provide space for ballast water tanks at various areas of the harbor for shared re-use of ballast water: vessels could discharge ballast water into the tank for use by other vessels. Is this an idea that should be further considered in the HHMP? Note that if it's an idea that the maritime community supports, DOT-H would provide space for the tanks, but wouldn't necessarily develop them.
   Discussion:
   - *This doesn't seem to be necessary for the operators. Don't consider this idea further.*
   - *Consider standardized pier height for vessels that need to ballast. If piers are at the same height, operators would be able to predict ahead of time their ballasting needs. When necessary, including emergency situations, operators can offload ballast water to an empty vessel (e.g., barges) rather than in tanks or into the harbor.*

6. Develop new cargo facilities or bunkering facilities along the 'Ewa side of Sand Island using the sea plane runway channel.
   Discussion:
   - *Developing a new cargo pier along the 'Ewa side of Sand Island may not be feasible within the HHMP time frame. Reference it as a possibility beyond 2050. Will require significant channel modification, dredging and working through environmental regulations.*

K. Maritime Support (slides 67-71)

1. Consolidate tug boat operators in shared office, warehouse and maintenance facilities at Pier 21 ("Tug Boat Row").
   Discussion:
   - *Yes. Consider this idea in the HHMP.*
   - *Tug crews need parking near the berth. There isn't reliable public transit to the piers. They need to drive and often leave their vehicles for extended periods while at sea. Consider developing vertical parking structures.*

2. Relocate the fishing vessels from Piers 16 to 18 and use the area for tugs and workboat berths.
   Discussion:
   - *Piers 16 to 18 are not deep enough for tugs; the propulsion system will stir up tires, cables, etc. lying on the harbor bottom.*

3. Consolidate ship repair services at the Piers 22 to 25 area. Consider widening the slipway by cutting back and improving Pier 23. This would require demolition of the old grain silos. Widen the slipway and reconstruct Pier 23 to create additional active berth space, or remove coral, improve fendering and clean up the existing pier face at Pier 23. (slide 69)

   Discussion:
   - *This would be very costly to achieve. Reconstructing Pier 23 is a major undertaking with or without the silo demolition cost. Might not be worth the benefit.*
   - *PSI uses the Pier 23 dolphins for maneuvering their dry dock at Pier 24, so there are potential conflicts if the slipway is used by another ship repair operator.*
   - *Clean Pier 23 slipway rather than cutting it back. It will be too costly to reconstruct if the only benefit is more pier for smaller work boats.*

4. Consolidate maritime users in shared facilities in various areas around the harbor. Consider offering long-term lease arrangements rather than month-by-month permits to incentivize investment.
   Discussion:
   - *Pier 27 prospective tenants were advised that they would have to pay the costs of infrastructure improvements from Nimitz Highway. Any one user cannot afford to make those improvements.*
   - *The lease terms (long-term lease v. month-to-month) continue to be an issue. Long-term leases are necessary for tenants to secure financing to underwrite owner-assumed improvements.*

- *Yes. Keep this idea in consideration moving forward.*

5. Develop a multi-level, mixed-use maritime center at Pier 23 to include office functions, a retail component, high-cube at ground level for cargo operations and auto parking/storage. This space will be used for maritime and non-maritime functions that are not dependent on the waterfront. Consider other locations in the harbor for this type of facility.
   Discussion:
   - *Yes. A multi-use, maritime center facility is a good idea and should be carried forward for consideration in the HHMP.*
   - *Pier 23 is a good location for harbor employee parking and long-term parking. Adequate parking within the harbor is a widespread problem. Some harbor workers park their cars for a 12-hour shift while others may leave their vehicles there for weeks. Workers often arrive at hours when public transportation is not available. Consider developing parking structures vertically.*
   - *The Pier 23 area is a good location for such a facility. The Piers 5 and 6 peninsula is also a good location to consider for a maritime center, but less desirable than Pier 23. The focus should be on office space, not industrial marine use (e.g., ship repair and servicing). Include parking because it is essential.*
   - *It's important to protect maritime priorities and do not let it become a commercial endeavor. Keep the facility for maritime use.*

6. Relocate Harbor Pilots to Pier 12.
   Discussion:
   - *Pier 12 is a viable location. For the Pilots to use that area, or any permanent location in the harbor, improvements would be necessary and a long-term lease would need to be considered.*

7. Cut notch in Pier 22 to accommodate floating dry dock.
   Discussion:
   - *This would eliminate berthing currently used by tug operators. At least 3 tug vessels would be displaced. It would be better to improve that portion of the pier for tug boats. The pier is currently in poor condition.*
   - *Staging the dry dock in that location would create a navigational issue in the slipway when combined with PSI's operations.*
   - *Don't consider this idea further*

8. Other Comments regarding Maritime Support
   Discussion:
   - *Figure out how to better utilize the space at Piers 19 and 20 area.*
   - *The fishing boats that berth at the end of Pier 17 constrain use of Pier 19 for large vessels.*

- *Consider adding a dolphin to the end of Pier 21 to expand the effective length of Pier 20.*
- *Adequate parking is needed throughout the harbor. Consider a vertical structure for parking.*

L. Fishing Industry

1. Redevelop Pier 37 and 38 and extend Pier 36 to the Federal Project Area to expand berthing for fishing vessels.
   Discussion:
   - *No objection.*
   - *The Fishing Village will be paving the two empty lots for parking and plans for the respite center between the Piers 35 and 36 area is underway.*

2. Extend Pier 16. Develop respite center at the Piers 16 to18 area.
   Discussion:
   - *Extending Pier 16 will prevent the use of Piers 19 and 20 by larger vessels. Don't consider this option further.*
   - *Respite center is a good idea.*

M. Cruise & Excursion (slides 77-82)

1. Modernize cruise terminals at Piers 10 and 11 by improving the circulation of Aloha Tower Drive from the current two-way traffic operation, to a one-way traffic operation, relocating the passenger terminal from Pier 11 to Pier 10, and renovating the terminal building to improve service vehicle access.
   Discussion:
   - *Modernization is overdue. Consider knocking down the Piers 10 and 11 structure and building a new structure.*
   - *Consider how cruise vessels resupply. Build in more flexibility to accommodate vessels docking on either the port or starboard side.*
   - *How can public transportation be better integrated with the cruise terminals?*
     - DOT-H can consider integrating the CCH's recently completed Transit Oriented Development (TOD) Wayfinding Master Plan. The CCH intends to implement and coordinate it with DOT-HWY.

2. Designate Piers 19-20 as an alternative terminal for cruise overflow or unscheduled calls.
   Discussion:
   - *Create more flexibility at the cruise terminals (either at Piers 19 to 20 or Piers 10 to 11) to allow ships to choose between docking port or starboard side.*

3. Consolidate all cruise operations at the Piers 1 and 2 area.
   Discussion:
   - *Do not turn Pier 1 into consolidated cruise terminal. "Burn the slide." Protect that pier as a cargo facility!*
   - *Ensure that the cargo facility is protected. Do not block or restrict Pier 1 to cargo operations.*
   - *Fueling a cruise ship at Pier 1 will create navigational problems in the harbor's entrance channel.*
   - *Consolidating presents more problems. Better to leave the second passenger facility at the Piers 10 and 11 area.*
   - *There is discussion about building a Chihuly Glass Museum at the Piers 10 and 11 area.*

4. Reconfigure queuing and staging at the Piers 1 and 2 area to improve traffic circulation. This includes acquiring federally-owned GSA parking lot (also known as the donut hole) for vehicle parking and queuing and increasing the staging area for containers and service trucks. Consider the idea of working with FTZ to develop a new parking structure on their property and the adjacent ballpark lot.
   Discussion:
   - *Consider exchanging the state parking lot (ballpark) for the GSA parking lot.*
   - *What size cruise vessels should DOT-H accommodate? The industry is trending toward bigger vessels, but Neighbor Islands aren't currently able to support them.*
   - *Find a way to build vertically. Everyone wants more space, so build up. Piers 1 and 2 are important deep-water docks. The landside area has the potential to improve if we consider better use of vertical space (i.e., a 7-story parking lot).*
     - The baseball diamond parking lot is next to a historic site, so historical context could impact vertical options.

5. Redevelop the Hawaii Department of Health (DOH) building as a visitor greeting and orientation center.
   Discussion:
   - *The center will only be used by a single vessel once-a-week on Saturdays for part of the year. What amount of resources should be committed to a building that will be under-utilized for extended intervals?*
   - *This will force visitors to walk across the street; it's not very efficient. What about inclement weather?*
   - *Why not just use the existing terminal for a visitor's center?*
   - *Consider how transportation can be more accessible to the visitors at the orientation center.*

- *Consider leasable office space there.*

6. Develop landside day excursions and support facilities at the Piers 5 and 6 peninsula area and relocate excursion vessel operations from Pier 8 to Piers 5 and 6.

Discussion:

- *Consider using Pier 7 for day excursion operations.*
- *The Piers 5 and 6 peninsula area is good alternative for a maritime center. Could other uses include layberth or day excursions?*
- *The Piers 5 and 6 peninsula could be a good location for a visitor orientation center. It is located centrally between Piers 10 and 11, Pier 2 and the Downtown Rail Station.*
- *Having a hotel at Piers 5 and 6 (that would generate clientele for day excursions) was proposed in the past, but didn't work out because the land owner and land developer could not reach an agreement.*
    - Hotel development might induce improvements to pedestrian connectivity to Downtown.

N. Non-Maritime (slides 83-92)

1. Consider developing the Pier 19 area as a visitor destination (e.g., aquarium or fish market). Improve pedestrian and bike connectivity, add landscaping, improve traffic circulation and provide wayfinding to encourage connectivity, particularly from Pier 2 Cruise Terminal to Aloha Tower Marketplace. Relocate DOT-H offices to DOH's building at Pier 2. Encourage mauka/makai pedestrian connections to improve access. Improve connectivity between Chinatown, Downtown and Kaka'ako. Design connections to future rail stations. Add pedestrian bridges across various points on Nimitz Highway and Ala Moana Boulevard. Convert Pier 11 to a commercial retail modeled after the San Francisco Ferry Terminal. Create a pedestrian promenade from Walker Park to Aloha Tower. Restore Irwin Park to its original use.

Discussion:

- *No objections.*
- *There have been discussions with Chihuly to put glass museum at the Piers 10 and 11 area. Chihuly is communicating with HPU about leasing office space.*
- *HPU has been in discussions with Michelle Matson regarding restoring Irwin Park back into a park. There are approximately 120 stalls there (that would need to be relocated). Piers 5 and 6 are a possible location to create more parking stalls, possibly by developing a parking structure. Adequate parking is a huge issue for HPU.*
- *HPU is considering adding more housing in proximity to the campus. Some ideas include a barge for student housing berthed where the Star of Honolulu is berthed (at Pier 8). HPU also looked at retrofitting*

HECO's property with apartments. There's a developer who is looking at developing an apartment complex on the west side of the HECO lot.

- *Pedestrian connectivity through these areas is something HPU is looking at. In two years, HPU will close its Hawai'i Loa Campus in Kāne'ohe and will consolidate 100 % of its operations, including approximately 4,000 students and 500 faculty and staff, to offices and classrooms at Aloha Tower, Pioneer Plaza and Restaurant Row. This will mean more students will be traversing through the "triangular" park area as they walk between the campus areas.*
- *The HECO site is no longer generating power; the actual area required for HECO's electrical facilities at the site is small The site is not available for acquisition or exchange with DOT-H, though there may be opportunities to work with HECO to find alternative uses for a portion of the site.*
- *Don't rule out the HECO site. HECO facilities can become a much smaller footprint, the rest can be redeveloped together with the rail station.*

2. Consider a boutique hotel, farmer's market, aquarium, multi-purpose building, maritime office center or parking at the Piers 5 and 6 peninsula.
   Discussion:
   - *The idea for mixed-use development with a parking component is a good idea. Expand the concept to include multi-family/residential units.*

3. Consider the CCH's *Iwilei/Kapālama Improvement Plan*.
   Discussion:
   - *Reference the State's updated TOD Plan, in lieu of the CCH's plan.*

4. Partially infill and extend outward the shoreline area of the slips between Piers 4 and 5, and between Piers 6 to 8 to increase land area for development, create a promenade, and enhance connectivity between Pier 2 and Aloha Tower.
   Discussion:
   - *Corals and other natural resources will need to be considered should any infilling occur.*

5. US Coast Guard (USCG) on Pier 4.
   Discussion:
   - *USCG does not have any plans to relocate Pier 4 in exchange for any other piers.*

6. Honor and memorialize the rich history of the harbor from pre-contact to early maritime eras. Incorporate any *mana'o* shared by descendants with lineal ties to various *ahupua'a* involved in the project. Consider the concentration of

historic sites within the area between Piers 2 to 12 including the former DOH Building, ICE Building, USCG Building at Pier 4, HECO site, King David Kalākaua Boat House (location of the Hawai`i Maritime Center) at Pier 7, Irwin Park, Aloha Tower, Piers 10 and 11, and Pier 12.

Discussion:

- PAC participants expressed support for this.

O. Break

P. Cargo Operations / Terminal Overviews (slides 93-116, presented by Harold Westerman, Stantec, and Jim Niermann, RMTC)

1. Terminal Overview (slides 94-104)
   a. These slides show the 2017 and 2050 terminal capacity utilization for each terminal. The projections assume that the capacity, existing operation, and operation parameters remain the same for the next 30 years. Another assumption is that the growth in each terminal will have the same percentage growth as the overall harbor.
   b. The Fort Armstrong Terminal (Pier 1) has enough capacity to accommodate an increased volume of containers in the future. Autos would be closer to capacity, with the increase from 80% utilization in 2017 to 90% in 2050. Break-bulk will continue to have plenty of capacity at this terminal.
   c. Pier 20 was recently dredged and has returned to service in the last few months. It is primarily being used for shipments of foreign direct vehicles. The Project Team does not have operational data for this pier, therefore we cannot estimate the current capacity utilization or the utilization projection in 2050. Although there is limited amount of data for this terminal, it will be an important pier for future cargo handling.
   d. The Pier 29 Cargo Terminal current utilization is above 30% and is expected to double in growth. This means the Pier 29 Terminal can still have adequate capacity to accommodate containers. Break-bulk will be expected to decline over the years and will have plenty of capacity.
   e. Pier 30 Fuel Manifolds have 30% utilization and is expected to grow to 45% utilization in 2050. Pier 30 is able to provide for additional capacity for liquid-bulk in the future. Note that Pier 30 is privately owned. DOT-H is not involved in providing fuel storage capacity but is concerned with ensuring there are sufficient facilities (berth, fuel manifold) for liquid-bulk vessels to load and offload.
   f. The Domestic RO/RO Auto Terminal (Piers 32-33) is operating at 25% capacity and will see growth up to 35% utilization in 2050. This terminal will continue to have sufficient capacity.
   g. The Interisland Cargo Terminal (Piers 39-40) will run out of capacity in 2050. They are currently operating at 80% for container capacity utilization. The overall harbor growth of containers will place this

terminal overcapacity at 135% utilization. This terminal will require additional capacity to accommodate more containers. Auto capacity for this terminal is an anomaly. The operator currently uses a two plus-acre area mauka from the Piers 40 and 41 slipway to store autos, known as the "Libby Yard." This yard will be lost once KCT becomes available. The "Libby Yard" allows the operator to operate below 100% utilization; however, the calculations presented in the slide exclude the "Libby Yard" storage area, and as a result, show the terminal at 140% capacity utilization for autos. The overall harbor growth in autos will place this terminal overcapacity at 162% capacity utilization in 2050. Break-bulk operation is at 80% and with the overall harbor decline for break-bulk cargo, the 2050 utilization will be at 60%. Containers and autos capacity at this terminal will need to be addressed moving forward.

h. Kapālama Container Terminal (KCT located at Piers 41 to 43), is currently under construction, therefore there is no utilization to estimate. Cargo operations at Pier 51A, and Piers 1 and 2 will move to this terminal when it is in service.

i. The Sand Island Terminal (Pier 51A) current container capacity is reaching utilization capacity. The current Pier 51A container operation utilization is 80% capacity and is projected to grow to 140% capacity utilization in 2050. The way to accommodate these volumes will be to move to KCT. The liquid-bulk manifold is at 75% capacity and with harbor wide growth the utilization capacity will reach 90% in 2050. Liquid-bulk will also be mitigated with the opening of a second fuel manifold at KCT.

Discussion:

- *What is the capacity and growth of liquid-bulk?*
  - For the purposes of the Master Plan, liquid-bulk capacity looks only at the berth capacity to load and unload vessel. It is generally a function of time available to work the ship at the berth and how quickly it can be unloaded. In this case, for liquid-bulk capacity, it is how many barrels you can pump in and out during operating hours of the ship and terminal.
  - There will be less available hours for tankers at the Pier 51A fuel manifold in 2050 due to anticipated increase in container vessel calls at that pier.

j. The other Sand Island Terminal (Piers 51B-53) 2017 utilization is near capacity at 95%. If the volume of containers continues to grow as projected, capacity will reach 165%. After cargo operations at Piers 51A relocate to KCT, the container storage limitations at the Sand Island Terminal will be alleviated. Autos are currently at 64% of capacity. This is an average consolidated wharfage number using data from 2016 to 2018. Assuming the harbor wide increase in autos, the terminal's auto storage will be at 80% capacity in 2050. Break-bulk is at 30% capacity and will decrease to 23% by 2050.

Discussion:

- *Matson will impact the capacity of the other terminals within the harbor depending on how they will utilize Piers 51 to 53. As of right now, Matson is handling most of its autos at Piers 31 to 33 and Pasha's auto operations are located at Pier 1. The growth factor of auto operations at Pier 1 and Piers 31 to 33 may be invalid once Pasha moves its cars to KCT and Matson moves its cars to Sand Island. The Project Team should coordinate with the operators to find out how they will utilize their terminals to gain a better understanding of the harbor capacity.*
    - The Terminal Overview slides show current and projected capacity utilization assuming the harbor continues to operate as it current does. This provides a baseline understanding of cargo activities in the harbor.

k. The Pier 60 Terminal is operating at 17% utilization for dry-bulk berth capacity. Yard capacity is not considered because the terminal operator manages the yard as necessary based on available storage and can pass material from the berth, through the yard and directly to a project site. In the future, it is expected that there will be a reduction in berth operations at this terminal, but there may still be some activity for aggregates being barged to neighbor islands. Therefore, projected 2050 utilization is expected to less than 5% of berth capacity.

2. Alternative Layout Options for Cargo (slides 105-116)
    a. Currently, there are 30+ acres of auto storage distributed across three terminals (Piers 1 and 2, Piers 19 and 20, and Piers 31 to 33), half of which are under-utilized. Honolulu Harbor will need 16.3 acres of storage for auto operations by 2050.
    b. One consideration is to consolidate all auto terminal operations by 2050. This can be accommodated at a single terminal (Piers 1 and 2) or a combined two terminals (Piers 19 and 20 and Piers 31 to 33). What are the preferred locations?
    c. Vertical auto storage is an option, but it's expensive and requires additional handling.

Discussion:

- *If the group had to choose, Pier 1 is best, then Pier 32, then Piers 19 and 20, but flexible terminals are the stated preference. It would be better to have three terminals with flexibility to accommodate any ship and cargo type. DOT-H needs to create a plan for flexible/configurable terminals to accommodate future growth as they do not know what Pasha's and Matson's plans are for the future.*
- *Split operations are undesirable for the operators. It will be expensive to move ships and cars around. Matson prefers to do everything at Sand Island.*

    - Once Matson takes over Pier 51A they would have plenty of space, but in the long-term they may have to densify their operations or relocate their auto operations to accommodate all their container operations at Sand Island.
  - *Don't consolidate auto operations.*
  - *Matson prefers to be able to off-load the combination ships with cargo and autos at one location. Consolidating its operations will reduce costs associated with combination container/ roll-on and roll-off (CON-RO) vessels. With pure car carriers, a split operation is not as much of an issue.*
  - *Operators should be allowed to manage the domestic autos in their terminals and consolidate the foreign-direct autos.*
  - *Off-loading all autos at one place could cause delays.*
    - Stantec noted that one consolidated terminal in Vancouver accommodates 600,000 autos per year. It requires disciplined scheduling and coordination. Matson may have to consider moving their autos away from Sand Island or densifying in the long-term.
  - *Foreign carriers are in port for 3 to 4 hours. Consider consolidating foreign carriers at Piers 19 and 20.*
  - *We have two major carriers (Matson and Pasha) that call at Honolulu Harbor. There are times when they want to bring their vessels in on the same days at the same times. Sharing the same terminal at the same time poses challenges and there may not be enough space.*
  - *Hawaii has a unique auto market. Matson and Pasha, in contrast to Vancouver, deal with rental car fleets waiting to get rolled back onto the ships to be sent back. They compete for this market, so ship scheduling and volumes are not as predictable.*
  - *MeetingSift: "Seems like consolidating auto operations should be scrapped since the two big operators do combo so separate auto location is not feasible."*
    - Themes for ideal cargo yards are: flexible, configurable, and considers the idiosyncrasy of the market. These points of information will be further discussed in other ideas. There may be more consolidation of cargo with the opening of KCT, which will free up more space at the other piers. Do not build in limitations that force the market to behave unnaturally.

d. Interisland Cargo Terminal (slide 109) requires additional capacity for containers and autos. It's a constrained facility with a unique shape. They load barges by both side ramp and stern ramp. The "Libby Yard" will be lost with the construction of KCT. Therefore, to create additional land for storage, there is an idea to fill in a portion of the slip between Piers 39 and 40 and to reconfigure space in the yard to make the area more efficient. Other ideas include strengthening the piers so that cargo

equipment can move all the way to end of the pier and improving fendering systems.

Discussion:

- *YB recommends filling in a portion of the Piers 40 and 41 slipway before filling in the Piers 39 and 40 slipway. The reason is the way that YB uses side and stern-ramps to load/offload barges requires approximately 300 feet of operating space on the pier. Currently, the Piers 40 and 41 berths are not usable for cargo. The constrained "pinch point" mauka of the Piers 40 and 41 slipway affects the safety of their operations. Filling in the Piers 40 and 41 slipway would ensure enough room for barge loading and unloading operations.*
- *YB still needs barge berthing space. Consider preserving berth space for barge operations.*
    - There could be an option to fill in both sides. Piers 39 and 40 require attention, facility upgrades, and more land. DOT-H and the operators can work out the specifics. Imminent action is desirable.
- *Cannot berth barges at the end of the piers because it would adversely encroach into the turning basin.*

e. Container Terminal Options (slide 110) - Once KCT becomes available, total Honolulu harbor container capacity will be around 1.86 million TEUs, assuming existing operations continue as-is. Total capacity at both KCT and Sand Island Terminal is about 1.55 million TEUs. The volume forecasted for Sand Island, assuming the same Harbor wide growth, will total 1.75 million TEUs. This means that they will have a shortage of around 200,000 TEUs or a little over 10% by 2040. This assumes that the autos are moved out of Sand Island. If autos stay at the terminal, then there will be a shortage of around 15% to 20%. There are a variety of ways to add 10% volume capacity such as adding berth space, additional land and/or reconfiguring operations. Seventy-five percent (75%) of the container yard is a wheeled operation and the vast majority of containers are stacked one-high. If stacked containers are increased from the current 25% to 35% or 40%, the terminal would meet the 2050 capacity needs. If Matson desires to keep their autos within the Sand Island Terminal, then they would have to do something more substantial to increase their capacity, such as reduce their dwell times even more. They will also need to look at grounding and densifying their operations. Based on the analysis, there doesn't appear to be a need for the terminal to go completely grounded by 2050.

Discussion:

- There were no comments.

3. Cargo Operations (slides 111 and 112)

a. Create flexible cargo terminals by removing buildings and existing structures, developing storage for large/ heavy maritime cargo handling and servicing equipment, improve piers for mixed-cargo operations and develop dedicated auto/ RO/RO piers.

Discussion:

- There were no comments. PAC members supported the concept generally during the earlier discussion on cargo.

b. Develop multi-level, mixed-use structures at various terminals (shown at Pier 23 in the presentation) that would include high-cube ground level for cargo operations, office, light industry, retail, and parking for maritime employees and auto storage.

Discussion:

- There were no additional comments. PAC members supported the concept generally during the earlier discussion on cargo.

c. Develop storage yard for autos and storage/maintenance facilities for container chassis at the Pier 60 Terminal.

Discussion:

- There were no objections.

d. Work with DLNR to swap DOT-H land near the small boat harbor for land that is better for DOT-H operations.

Discussion:

- There were no objections.

e. Develop new roadway entrances and acquire ROW to create a business frontage and improve street circulation near Pier 60.

Discussion:

- There were no objections.

f. Harden yard surface for bulk aggregate storage at HC&D lease area to prevent cross-contamination of existing soils.

Discussion:

- *This would also prevent sediment discharges at the facility access points and prevent groundwater contamination.*

4. Flexible use Areas (slide 113)
   a. Flexible use areas to accommodate displaced operations during pier/yard improvement projects are identified at Piers 1 and 2, Piers 19 and 20, Piers 31 to 33, and Pier 51A.

Discussion:

- *Let the market and the operators determine how to best make use of the few cargo areas they have available. Flexibility to manage capacity is very important to the operators.*
- *Operators prefer options for the safety and welfare of the workers and for the people who come to pick up their cargo.*
- *Operators don't want to build in limitations and are currently disinclined to change practices.*

- *Keeping Piers 1 and 2, Piers 19 and 20, and Piers 31 to 33 flexible will accommodate future growth.*
- *Flexibility of terminals makes Honolulu Harbor more adaptable and resilient in case of emergency.*
- *Currently, the docks are generic and all-purpose. Operators prefer it that way.*
- *KCT, Interisland Cargo Terminal, and Matson Sand Island Terminal are not flexible use areas. Matson objects to designating Pier 51A as a flexible use space. Don't list it as a flexible use pier. Matson will deal with the construction and improvements at Pier 51A and will work around the construction of those piers.*

Q. Potential Land Transactions (slide 114)

1. USCG's Pier 4 for Pier 53

   Discussion:

   - *The USCG representative informed the group that the USCG Admiral intends to hold on to Pier 4; however, he will go back and inform the command that DOT-H is interested in acquiring Pier 4.* [Note: Resolution of this alternative will require higher-level discussions between USCG and DOT-H.]

2. Other possible land acquisition agreements: Office of Hawaiian Affairs (OHA), Tyco Pier, Federal GSA parking lot near Pier 2, trading the Keehi Industrial Park Association (KIPA) for CCH Department of Land Management (DLM)/ DLNR – Hale Mauliola on Sand Island, and coming to a mutually beneficial arrangement with HECO for redevelopment the power plant site and acquire the HECO property on Sand Island.

3. DOT-H is in the process of acquiring the Honolulu Freight parcel near Pier 34.

4. Other off-site properties may be considered if more land is required.

   Discussion:

   - There were no additional comments.

R. End of Presentations

S. Closing Remarks from PAC Participants

1. Practical considerations plan contents:
   a. *Keep regulatory departments apprised of plans and ideas. In-water construction requires consultation with the agencies. Come to the agencies early and often.*
   b. *Biosecurity is very important. There will be increased vessel traffic in the future, which will increase potential vectors. There must be a*

place for quarantining and inspecting cargo. Limit ballast water exchange and have hulls cleaned.

c. *Protection of seagrass, fish and limu resources, which are used for food, must be accommodated in the HHMP. This is one of the most abundant places on O'ahu for these resources.*
d. *Be aware there was a heiau at the head of the harbor before there was a harbor: the Heiau of Pakaka. It's one of the things that makes this harbor important.*
e. *Nimitz highway traffic gets bottled up in that corridor. The HHMP should include a review of traffic flow to make the movement of goods more efficient through the corridor. Involve DOT-Highways Division in the planning process to coordinate the critical connection between the port and the public road system.*
f. *Nimitz Highway is the lifeline for product transport. Nimitz Highway traffic treatment should be coordinated as part of the DOT-Highway study.*
g. *Harbor facility flexibility improves post-disaster recovery and adaptability.*
h. *Integrating HHMP planning efforts with HPU, Kaka'ako stakeholders and visitors' needs and interest can help inform site interpretation to convey important information about the harbor area and associated environment.*

2. Thoughts on the process of the plan:
   a. *Ports and harbors are the most important parts of a nation.*
   b. *Keep the planning process a collaborative one going forward.*
   c. *This has been an excellent planning process.*
   d. *This feels like a useful and productive discussion that will make the harbor better.*
   e. *This has been a very informative exercise that provided us with information outside of our typical operating areas.*
   f. *It has been nice to be part of a collaborative and cooperative process. Thank you for making the effort to include us. Keep the collaboration going moving forward.*
   g. *The information has been eye-opening.*
   h. *Expect nothing but the best out of the plan.*
   i. *We are all connected. See if we can keep everything working to support all of the maritime needs.*
   j. *Nobody has lost perspective. Every group and representative has maintained their perspective, and no one has wavered from their positions. This is going to make this process very important for DOT-H going forward. Non-maritime still has a place to play in the harbor and the maritime users still know their role in the harbor. Who's going to make sure that we keep this effort going and continue to maintain*

these efforts? I think we're going to put together a great plan with a strong case for a solid investment in harbor improvements.

T. Future coordination

1. Preliminary alternatives will be developed based on input from PAC #1 and will be presented for additional input and refinement in future PACs and PIMs over the coming year.

2. The Project Team will follow up with the PAC to notify them of the availability of the PAC #1 meeting notes and future meeting notices.

3. Any additional questions or comments can be sent through the Honolulu Harbor website and by phone or email to the Project Team https://honoluluharbormp.com/pac

U. Officially adjourned (3:00PM)

Honolulu Harbor 2050 Master Plan
Planning Advisory Committee 1

Contact Last Name	Contact First Name	Sub-TAC Group	Email	Affiliation	PAC 1 Attendance
Enos	Ed	Vessel Operations		Hawai'i Pilots Association	
Edwards	Ruby	Agency (State Office of Planning)		State Office of Planning	
Ensley	Kyle	Agency (U.S. Coast Guard)		U.S. Coast Guard	KLE
Friel	Lek	At-Large (Matson)		Matson	
Funakoshi	Rodney	Agency (State Office of Planning)		State Office of Planning	
Gemeno	Blaine	At-Large (Sause Brothers)		Area Manager, Sause Bros.	
Grune	Randy	Cargo Operations		PASHA/Hawai'i Stevedores	
Harter	Bob	Adaptation & Resiliency		City and County of Honolulu (CCH), Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management	
Haynes	Tracy	Adaptation & Resiliency		Federal Emergency Management Agency	
Kaanehe	Blue	Agency (DLNR)		Administrator, DLNR	
Kuloloio	Manuel	Non-Maritime Opportunities		Kuloloio Ohana	
Los Banos	Aedward	Agency (HCDA)		Executive Director, HCDA	
Lu	Kim	Fishing Operations		VAK Fisheries, LLC/Boat Owner @ 16-18	
Lum	Traci	Agency (DOT-STP)		DOT-STP	
Martin	Christy	Environment		Coordinating Group on Alien Pest Species	
Martin	Sean	Fishing Operations		POP Fishing and Marine	
Moku	Sam	Non-Maritime Opportunities		Hawai'i Pacific University	
North	Gary	At-Large (HHUG)		HHUG	
Nikaido	Blayne	Agency (DOT-STP)		DOT-STP	
Oh	David	At-Large (PAR Hawaii)		Marine Operations Manager, Par Hawaii	

Olson	Whit	Vessel Operations		FOSS Maritime	
Pillone	Peter	At-Large (DOT-H)		Commercial Harbors Manager, Oahu District	
Polhemus	Dan	Environment		US Fish and Wildlife Service	
Rocheleau	Andrew	Maritime Support		Sea Engineering	
Schilling-Wheeler	Noelani	Cruise & Excursion Operations		Oahu Visitors Bureau	
Sikkink	David	Agency (DBEDT-Foreign Trade Zone)		Administrator, DBEDT-Foreign Trade Zone	
Takekawa	Neil	At-Large (DOT-H)		Oahu District Manager, Oahu District	
Toguchi	Charlie	Cruise & Excursion Operations		Norwegian Cruise Lines	
Whitworth	Tiffanie	Maritime Support		Young Brothers	
Williams	Josh	Agency (U.S. Coast Guard)		U.S. Coast Guard	
Zane	Jimmy	Cargo Operations		McCabe Hamilton & Renny Co.	
Rene	Harrison	DPP/TDD			
Yocum	Janet			FEMA	

In place for Renee

MEETING NOTES

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Date/Time:	Friday, February 28, 2020; 8:30 a.m. to 12:00 p.m.
Location:	Homer Maxey Conference Center 521 Ala Moana Blvd., Honolulu, HI 96813
Purpose:	Planning Advisory Committee (PAC) Meeting #2
Host:	Department of Transportation, Harbors Division (DOT-H)
Attendees:	Please view sign-in sheet

- Notes in [bracketed blue text] indicate supplemental information not explicitly discussed during the meeting.
- *Brown italicized text* indicates comments or questions by PAC participants
- Brown regular text indicates a comment or response from the Project Team.

A. Welcome/Introductions Presentation Slides 2 – 4.

1. Opening remarks from Derek Chow
   a. Gratitude for all PAC members and their time and attendance today.
      i. The HHMP is a very special master plan because: 1) Honolulu Harbor is the most used harbor in the State of Hawai'i and the center of the State's hub-and-spoke cargo distribution system; and 2) Honolulu Harbor's strategic role related to security, economic development, and humanitarian services in the Indo-Pacific region is growing.
   b. DOT-H takes all PAC comments and suggestions seriously, and it helps the development and planning process of the harbor.
2. Group Introductions [Note: See presentation Slides 2 – 4 and sign-in sheet.]
3. Sign-in Reminder
4. MeetingSift Set-up [Note: Comments that were made with MeetingSift are located within discussion sections.]

B. Meeting Overview (presented by Linda Colburn, Where Talk Works [WTW]) Presentation Slides 6 – 9.

1. Meeting Purpose
2. PAC's Role
3. Expected Outcomes for PAC #2

4. Agenda

C. Master Plan Update (presented by Jim Niermann, R. M. Towill Corporation [RMTC]) Presentation Slide 10.

1. Planning Process
   a. The PAC #2 meeting is moving from information gathering and lists of individual ideas organized around the eight Sub-TAC categories into development of cohesive alternatives tied to specific locations around the harbor.
   b. Input from PAC #2 will help in preparing for the first Public Information Meeting (PIM) sometime at the end of April or early May.
   c. Feedback from PAC #2 and PIM #1 will be refined into the Draft HHMP, with DOT-H's preferred recommendations, which will be presented for PAC review at the PAC #3 meeting sometime in July/August 2020.
   d. A Preliminary Phasing Plan will also be presented at the PAC #3 meeting. The phasing discussion will be initiated in today's PAC #2 meeting and your comments considered as we prepare the Preliminary Phasing Plan.
   e. The PIM #2 meeting is anticipated to be held in early fall, following PAC #3. The Draft HHMP will be presented at the PIM #2 to provide the public a final opportunity to comment. A PIM #3 is optional and might be held following completion of the HHMP in early 2021.
   f. PAC #4 will be held by the end of 2020.
   g. At the PAC #4 meeting, DOT-H and RMTC will request PAC members for their endorsement (voluntary signatures) of the integrity, truth, and transparency of the HHMP planning process. The endorsement statement will be included in the Final HHMP. We will circulate a draft endorsement statement for comment prior to PAC #4.

   [Note: Due to the government and community response to the COVID-19 pandemic, the PAC and PIM meeting dates will be postponed until the situation improves and normalizes.]

   Discussion:
   - There were no comments and questions made by PAC participants on this section.

D. General Overview and General Improvements Presentation Slides 10 – 28.

1. General Overview
   a. Major cargo terminals
      i. Cargo terminals include Sand Island, Kapālama Container Terminal (KCT), Piers 39 to 41 Interisland Cargo Terminal, and general use cargo piers at Piers 1 and 2, 19 and 20, 29, 31 to 33, and 60.
   b. Maritime Support
      i. Maritime support uses are generally located between Piers 12 to 38.
   c. Fishing Piers

i. Piers 38, and 16 to 18.

d. Non-Maritime Development Opportunities
   i. Piers 5 to 11.

e. Pier 2 Cruise Terminal and foreign-trade zone (FTZ)
   i. Piers 1 and 2 area focus.

Discussion:

- There were no comments and questions made by PAC participants on this section.

2. Potential Land Transactions (Slides 18 and 110)
   a. Keehi Industrial Park Association (KIPA) – a 1.2-acre (AC) portion of the KIPA area adjacent to the Small Boat Harbor was transferred out of DOT-H jurisdiction to Department of Land and Natural Resources (DLNR).
   b. Hale Mauliola site on Sand Island – The approximately 6-AC site is currently leased by DLNR to the City and County of Honolulu (CCH) for use by the Hale Mauliola Transitional Housing program. [Note: The initial lease expired in September 2018, after which the DLNR granted a 4-year extension.] The transitional housing program is successful. Acquiring the site for harbor use would require relocating the housing program. At present, the cargo projections do not support a need for expanding into this area that would justify moving the program.
   c. Servco Property – Servco recently indicated an interest in selling this 14.5-AC site. DOT-H is interested in acquiring the site for future harbor use if an agreement can be reached. [Note: The State is no longer in negotiations with Servco for acquisition of the property.]
   d. Department of Agriculture (DOA) Driveway – Acquiring access rights over the DOA driveway will open an additional direct access from Auiki St. into KCT.
   e. Honolulu Freight Service – DOT-H is in the process of acquiring this 5.5-AC site adjacent to Pier 35. It is anticipated that it will take 3 to 5 years to conduct environmental mitigation and compliance and complete the acquisition process.
   f. Hawaiian Electric Company (HECO) Parcel – HECO's 2.3-AC site adjacent to Nimitz Hwy. near Pier 31 is a desirable site for acquisition by DOT-H because it is contiguous with existing harbor facilities. There are no specific uses contemplated for this site and no current discussions between the two agencies. HECO has not offered this site but DOT-H would be interested if the opportunity arises.
   g. Pier 4 – Pier 4 is currently owned by the U.S. Coast Guard (USCG). USCG has indicated their intention to retain Pier 4 for their own use. DOT-H would like to acquire Pier 4 and integrate it into plans for the Aloha Tower area.
   h. General Services Administration (GSA) Lot – The GSA lot is a 1.4-AC lot adjacent to the Pier 2 cruise terminal owned by the federal government and used for parking by various federal agencies. DOT-H initiated

discussions with the federal government to acquire the property for use to improve ground transportation circulation at Pier 2.

i. Hawai'i Community Development Corporation (HCDA) Remnant Strip – DOT-H would like to acquire from HCDA a 0.8-AC strip of land located adjacent to the Pier 1 truck gate. The remnant strip is currently unused.
j. Office of Hawaiian Affairs (OHA) Parcel at Pier 1 – DOT-H is interested in incorporating the 5.5-AC OHA parcel into the Pier 1 cargo terminal if a mutually beneficial arrangement can be made with OHA. The site is currently developed with a warehouse building that is used by Re-Use Hawai'i recycle center and by "Next Step" homeless shelter.
k. Tyco Pier on Sand Island – DLNR is not renewing Tyco's lease. The waterside of the pier will be placed under DOT-H jurisdiction, while the land side will be under DLNR Division of Aquatic Resources (DAR) jurisdiction. The waterside currently has two dolphins spaced 350 feet (FT) apart with potential room to expand to 1,200 linear feet (LF) of berthing space.
l. Pier 53 – DOT-H is transferring ownership of the waterfront segment of Pier 53C that fronts the USCG Sand Island base to the USCG.

Discussion:

- There were no comments and questions made by PAC participants on this section.

3. General Improvements (Slides 19 – 28)
   a. Harbor Entrance Widening (Slide 20)
      i. For planning purposes, the Project Team will prepare a desk-top channel widening analysis for the main harbor entrance and Kapālama Channel based on U.S. Army Corps of Engineers (USACE) engineering and design standards for deep draft navigation projects. The DOT-H will request the USACE to conduct a formal feasibility study and benefit-cost analysis (BCA) of harbor entrance channel widening, deepening the operational draft of the harbor and constructing a breakwater.
4. Second Harbor Entrance (Slide 21)
   a. Re-open second harbor entrance at the Sand Island Bridge for use during emergencies.
      i. Alternative A: movable bridge to accommodate full-size cargo vessels.
      ii. Alternative B: fixed bridge with air draft to accommodate tug & barge, and fishing vessels.

Discussion:

- *With regards to the harbor entrance widening and second harbor entrance, if the HHMP is doing a movable bridge, you will also need to deepen the channel. You can't have one without the other.*
- *The second harbor entrance must be able to accommodate both tug and barge vessels as well as container vessels.*

- *Whether you're making it for tugs and barges or keeping it as an emergency channel, you're making a commitment to keeping it dredged and maintained at a rated depth.*
  - An operational depth of minus 45 FT is required for cargo vessels. Current depth, due to sedimentation, is about minus 22 FT or 23 FT. The Kalihi Channel is currently authorized by USACE for a draft depth of minus 35 FT and would need to be reauthorized for a greater depth.

MeetingSift Comments and/or Questions:

- (Slide 21) *How old is the existing bridge? How much lifespan remains?*
- *The Sand Island Bridge was built in the early 1960s, already 60 years old!* [Note: The original bascule bridge was built in 1962. The adjacent fixed bridge was built in 1986.]
  - The Project Team will look into existing bridge condition assessments and the remaining projected useful life.
- (Slide 22) *Federal Emergency Management Agency (FEMA) supports a second port entrance with deep port capability to enable operations to continue if disaster impacts the primary entrance.*

5. Raise Pier Heights (Slides 22 – 23)
   a. To address port resiliency and sea level rise (SLR), plan for 3.2 FT SLR by 2060 (baseline 2019).
   b. Raise gantry-supported cargo pier decks to consistent height of 10 FT above mean lower low water (MLLW) following the design set by KCT. Raise all other working piers to a height appropriate to the vessel type and operational needs.
   c. The Project Team is considering recommending raising pier deck heights at Piers 1 and 2, 19 and 20, and the Interisland Terminal between 8 and 10 FT above MLLW. The final height will be determined in consultation with the cargo operators to identify vessel type and operational requirements.
   d. Pier heights determined for Honolulu Harbor will help establish statewide pier height standards. This will help the operators plan and design future vessels that will be able to operate across multiple state ports.
   e. DOT-H started consultation with harbor operators and project engineers to determine minimum and maximum pier deck heights based on vessel type. Preliminary input is presented in the following table. The Project Team encourages the maritime operators on the PAC to review and comment on these preliminary numbers.

Type of Vessel / Operations	Minimum Height of Pier Deck Above MLLW	Maximum Height of Pier Deck Above MLLW
Barge (RO/RO)	6	10
Barge (Pass-Pass)	6	12
Bulk Carrier	6	15
Container	6	15
Cruise	5	10
Fishing/Workboats	3	8
Tanker	6	15
Tugs	3	9

Discussion:

- *Standardize pier heights as much as possible throughout the State. For example, if all piers could be 10 FT, then ships would not require as much ballast water, which would reduce the amount of ballast water discharge and thus reduce the potential for invasive species release.*
- *Matson and Pasha have RO/RO ramps on their ships that, when the piers are too high, can't be lowered. Consider where the hinge is to ensure that their ramps can come down.*
  - HHMP will work with operators to identify operational needs of various vessel types as the basis for determining standardized pier heights. Please let us know if our information and numbers are accurate or inform us of your operator's specific capacities.
- *Look at other ports in the nation that are developing resilience design guidelines and practices: namely Port Authorities of New York/New Jersey (NY/NJ) and Massachusetts.*

  [Note: The following port resilience design guidelines and practices were provided by Matthew Gonser, Coastal and Water Program Manager, Office of Climate Change, Sustainability and Resiliency (OCCSR), CCH, after the PAC #2 meeting. The recommendation is to establish expectations for standards and different design/construction decisions, demonstrate the rationale and formalize the design parameters, as well as identify exercises and practices for deploying additional disaster event products.

- *Port Authority of NY/NJ Climate Resilience Design Guidelines* (June 2018; does immediate download of the PDF. https://www.panynj.gov/content/dam/port-authority/business-opportunities/pdf/climate-resilience.pdf
- *Massachusetts Port Authority Floodproofing Design Guide* (April 2015): https://www.massport.com/media/1149/massport-floodproofing-design-guide-revised-april-2015.pdf
- *Massachusetts Port Authority Sustainability and Resiliency Design Standards and Guidelines* (December 2018): https://www.massport.com/media/3111/massport-sustainability-and-resiliency-design-standards-and-guidelines-dec2018.pdf
- Massachusetts Port Authority *webpage*, Capital Improvements > sustainability > resiliency and climate change: http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/resiliency-and-climate-change/
- *Port of Long Beach Climate Adaptation and Coastal Resiliency Plan* (Fall 2016): https://www.slc.ca.gov/wp-content/uploads/2018/10/POLB.pdf]

- *Honolulu has a Mayor's directive of 3.2 FT until the end of the century while critical facilities need to consider 6 FT. Is there any consideration of making the plan adaptable for up to 6 FT?*
  - We are looking into the viability of options to raise the pier aprons or rails to create a "sea wall" along the pier edge and researching if there are any other ports where this has been successfully implemented that might offer an example of an adaptable design to accommodate changes in actual SLR over time.
- *What will be the pier heights for KCT?*
  - Pier heights at KCT will be 10 FT.

MeetingSift Comments and/or Questions:

- (Slide 23) *Matson and Pasha RO/RO ships need to fact check height of ramp coming off ship versus height of 'new' dock.*

6. Resiliency Piers (Slide 25)
   a. Identify piers that are a priority for strengthening and improving as emergency staging piers. An option would be to first focus on piers that don't have regularly scheduled operations (Piers 1 and 2, 19 and 20, and 31 to 34).
   b. The focus on Piers 1 and 2 as the priority resiliency pier is supported by the findings of Martin & Chock, Inc.'s 2017 *Honolulu Port Analyses for the Hawai'i Tsunami Scenarios* study, which determined that damage to Honolulu Harbor would primarily result from tsunami backwash carrying debris from upland areas and would primarily impact piers in the harbor interior. The proximity of Piers 1 and 2 to the harbor entrance channel, where there is a lower likelihood of navigational obstruction following a

disaster event, is another reason it is being considered for priority attention.

c. Ultimately, all the cargo piers are proposed to be improved as flexible, multi-use piers, and open space that can handle a variety of cargos and serve as resiliency/emergency staging piers.
d. Resiliency pier improvements may include:
    i. Strengthen the piers and decks, consider sheet-pile/bulk-head construction for pier reconstruction, install heavy lift pads, and hardened power/communication conduit.
    ii. Pre-stage emergency equipment and supplies in existing or planned multi-use, reinforced structures. Develop hardened vertical structures where they can serve multiple purposes, including pre-staging fuel, generators and other equipment: e.g., accommodate emergency staging (fuel, generators, and other equipment and materials) into the design of the proposed Maritime Center at Piers 22 and 23. Do not build hardened structures as stand-alone buildings for a single purpose.
e. Consider using the Triple F building to pre-stage materials (e.g., fuel, generators, & etc.).
f. The DOT-H O‘ahu District has an informal agreement with Pu‘uhale Elementary School to relocate motor vehicles and equipment from the DOT-H baseyard to the elementary school grounds in the event of a tsunami or hurricane event.

7. Layberth Need (Slides 26 – 27)
    a. Layberth needs were calculated as follows:
        i. Piers included in the layberth analysis are Piers 1 and 2, 9 to 11, 19 and 20, and 29 to 34. These are the piers that are typically used for general layberth and are not dedicated to a specific use.
        ii. The layberth analysis excluded the fishing fleet piers, tug row, the ship yards, excursion vessel piers, University of Hawai‘i (UH) Pier 35, Marine Spill Response Corporation (MSRC) Pier 15 and the cargo piers, based on the assumption that those are active, dedicated piers not used for general layberth.
        iii. A target utilization rate of 30 percent was used for unscheduled piers, and a target utilization rate of 50 percent was used for scheduled piers. These utilization rates would generally accommodate both working vessel calls and layberth calls at those piers without conflict.
        iv. For each of the piers, berth foot days (BFD) and additional pier length that would be required to maintain 30 or 50 percent utilization was calculated through 2050 to determine layberth needs.
        v. 650 LF of layberth was added to the total future layberth need to make up for the loss of UH Snug Harbor as a result of the KCT improvements.
    b. Outcomes of layberth analysis:

i. A total of approximately 2,000 LF of additional layberth will be required by 2050 to maintain the target utilization rates and compensate for the loss of Snug Harbor.
ii. Additional layberth is required to minimize future layberth scheduling conflicts in the harbor.

c. Layberth Alternatives (Slides 27 and 57)
i. The Tyco Pier on Sand Island is the best opportunity for developing new, deep-draft layberth within Honolulu Harbor. With improvements such as additional mooring dolphins, it could add approximately 1,200 LF of layberth. The Tyco Pier would serve only as a waterside berth; no landside pier improvements are being considered. DOT-H is currently working with DLNR to bring the existing dolphins under DOT-H's jurisdiction.

BERTH UTILIZATION AT HONOLULU HARBOR BY PIER			Forecasted Lay Berth Need (LF)
	Utilization Rate	Piers	FY 2050
UNSCHEDULED LAYBERTH NEED (LF) =	30%	9, 10, 11, 19, 20, 29, 31, 32, 33, and 34	735
SCHEDULED LAYBERTH NEED (LF) =	50%	1 and 2	536
		Snug Harbor	650
LAYBERTH NEED TOTAL =			1,921

Potential New Layberth (LF)	
Projected Layberth Need	1,921
Potential New Layberth	
Tyco Pier	1,200
Pier 38	960

Total	**2,160**

ii. Pier 38 offers an opportunity for developing an additional 960 LF of layberth space for shallow-draft vessels. New berthing in this location may be used for fishing vessel off-load and provisioning and for layberth. Consider reconstructing the existing fuel barge pier. Consider a floating dock design for fishing vessel and work boat piers. Floating dock design may be more resilient to tidal fluctuations and to Kapālama Channel outfall bore.

iii. Miscellaneous existing piers within Honolulu Harbor that aren't dedicated to a specific use may be designated or improved for layberth use. These include Piers 7, 23, and 27DL. These piers are not suitable for large deep-draft vessels but may be improved for barge and smaller vessel layberth. Pier 7 can be reopened for layberth with the removal of Kulamanu [Note: Kulamanu was removed in the Summer, 2019.] and the Falls of Clyde but may also be used for excursion vessels. These piers might also be used for active maritime use and thus may become unavailable for layberth.

iv. Areas within Keehi Lagoon may be considered for development for layberth use, including Pier 60 and Slipper Island. Note that the seaplane runway along the makai side of Sand Island is no longer being considered for layberth facilities due to entitlement requirements, environmental regulations and high development costs.

Discussion:

- *There are operational concerns about extending pier improvements at Pier 38 for use as berthing or layberth.*
  - *Tug and barge operations at Pier 39 Interisland Terminal don't leave a lot of room for fishing and work vessels. No rafting can be allowed along Pier 38, only single-vessel berthing to avoid encroaching into the tug and barge navigation area.*
    - With regards to Pier 38, there will be no rafting. It would be used for single vessel berthing and primarily used for fishing boat servicing, provisioning and off-loading fish.
  - *Tugs cause propeller/thruster wash that can impact smaller boats at berth.*
  - *Draft depths near Nimitz Hwy. are very shallow, which constrains vessel navigation and can cause damage to propellers, thrusters and rudders from sediment and debris.*
- *With regards to Pier 23, you won't benefit from layberth there because there is very little room as Pacific Shipyards International (PSI) (on Piers 24 and 25) already tie their floating dry dock to the*

bollards on the other (Pier 23) side of the slipway, which constrains berthing at Pier 23.

- *Regarding Piers 22 and 23, you would need to improve the pier edge and make the slipway deeper to use it as a layberth. That would be helpful as tug operators have to get the tugs in there to pull the dry dock out, so any increase in space is helpful.*
  - This is a valid point, and discussions will be made with PSI to accommodate proposed changes.
- *Is there a scenario where Pier 23 could be utilized for active or layberth?*
  - Not for layberth. It would have to be temporary. There is a lot of activity going on there from PSI's operations.
- *Layberth at Pier 60 or Slipper Island would require dredging as the water is quite shallow there.*
  - This is a valid point and will be considered by the Project Team.

MeetingSift Comments and/or Questions:

- *(Slide 27) Layberth Slide: FEMA supports any increased capacity to expand capacity of ports.*

d. SLR Agency Coordination (Slide 28)
   i. Coordination among federal, state, and county agencies is necessary to address multi-jurisdictional modifications and improvements to drainage systems, roadways, and electrical power systems that will be required to address changing conditions due to SLR and climate change.
   ii. There are 100+ drainage outfalls in the harbor, many of which will become submerged and need to be elevated as SLR increases. The responsibility for most of the outfalls lies upstream outside of DOT-H's jurisdiction. Failure to address this issue may result in drainage system backups and flooding from upstream manholes and inlets. The drainage outfalls, including Kapālama Canal and Nu'uanu Stream, frequently discharge trash and debris that create navigational hazards, damage harbor vessels (e.g., tires and other debris gets sucked into boat thrusters and propellers), and collect on the harbor bottom affecting operational draft depths. DOT-H is studying various alternatives for debris interception, collection and disposal. However, management of upstream drainage sheds and drainage systems is key to mitigating impacts to the harbor. During the Sub-TAC meeting on Adaptation and Resiliency, comments included a recommendation for a drainage master plan for urban Honolulu.
   iii. DOT has started identifying critical roadways that are essential for transporting cargo from the harbor to the end users, and for transporting other essential goods and services. These include Nimitz Hwy., Ala Moana Blvd., Sand Island Access Rd., Waiakamilo Rd., Alakawa St. and Kalihi St. DOT, Highways Division (DOT-HWY)

is considering elevating critical roadways above the projected SLR. In addition to the design challenges and costs involved, raising critical roadways could adversely impact adjacent properties by impounding water and causing flooding. Slide 28 identifies preliminary roadways identified as "critical", including some under CCH jurisdiction.

iv. A recommendation came out of the PAC #1 meeting to consider pumping water from the water table to prevent impacts to infrastructure and pavements from rising ground water levels due to SLR. Rising ground water might also result in the release of ground water contaminants. The Project Team is looking at examples from New York City where this measure is being employed.

Discussion:

- *What is the drainage plan? How do you prevent raised roads from becoming dikes?*
  - DOT and the CCH are studying this issue and looking at practices on the mainland and in Europe. There's no simple solution or answer at present.
- *There is a group, that includes CCH as well as the State, considering the roadways, flooding, and how that will affect potential development in the lower 'Iwilei "bathtub." The Hawaii Housing, Finance and Development Corporation (HHFDC) is completing an infrastructure master plan for the area around Mayor Wright Housing; the plan will support redevelopment of Mayor Wright Housing. The CCH is partnering with HHFDC to complete that study. It's not right up against Nimitz, but this will affect the drainage, and CCH will work with the Project Team on that.*
- *Has CCH, Department of Facility Maintenance (DFM) been part of drainage discussions?*
  - We have had one discussion with DFM. We are aware of the current legislation to disincentivize hardscape improvements / incentivize permeable and greenscape treatments on residential properties. We will include DFM in future discussions.
- *Matt Gonser clarified that the proposed legislation includes provisions for "Fee for Service" to fund the services and investments needed to maintain O'ahu's storm water infrastructure.*
- *Stormwater management is more than just a pollution issue. It's a navigation safety issue. After every big rain, especially after a long hot summer, logs, twigs, shopping carts, etc. end up in the harbor. If something gets stuck in the props, tug operators can't move the ships around safely. In Hilo last month, a tanker's engine sucked up a tire. Debris and garbage impact the ability of ships to move safely and threatens the cargo industry. We would like some kind of garbage trap similar to what the Ala Wai had at one point.*
- *CCH advises that we should make comments on the Kapālama Canal Environmental Impact Statement (EIS) to strengthen the*

discussion about drainage concerns. CCH is looking at silt traps on the mauka end of Kapālama Canal, near H1, above the King St. area. They are looking at different things to put on each of the storm drains. Please make those comments so they can be included in the EIS.

- DOT-H made those comments about upland collection improvements while attending the Kapālama project meetings. And DOT-H is working with DFM and making sure it is coordinating with them on this and SLR.

- *Keep in mind that there are no flood control measures on Kalihi St. The full discharge goes straight into the Harbor.*

E. 2050 Throughput and Capacity Needs (presented by Harold Westerman, Stantec) Presentation Slides 29 – 46.

1. Existing Capacity vs. 2050 Throughput (Slide 30) and Projected Container Throughput and Capacity (Slide 31)
   a. By 2050, KCT will be operational and will add approximately 430,000 Twenty-Foot Equivalent Units (TEU) of container capacity to Honolulu Harbor. Harbor capacity with KCT and projected 2050 cargo throughput is presented in the table below.

Sector	Unit	Existing Capacity	Annual Throughput Projection 2050	Difference
Containers	TEUs	1,860,000 (w/ KCT)	2,046,000	**-186,000**
RO/RO (Automobiles)	Units	367,000	225,000	+142,000
Liquid Bulk*	Bbls	20,630,000 (w/ KCT)	10,080,000	+10,550,000
Break-Bulk/Neo-Bulk	Tons	763,000	368,000	+395,000
Dry-Bulk (Aggregate)*	Tons	500,000	< 10,000	+500,000

b. The projections indicate that by 2050, with the addition of KCT, Honolulu Harbor will have adequate capacity for all cargo categories except containers. Assuming the cargo terminals will continue to operate as they do currently, with no changes to yard density, dwell times or cargo handling, the projections indicate a container capacity shortfall of 186,000 TEUs (1,860,000 TEU capacity accommodating 2,046,000 throughput), which is approximately 9 percent of projected 2050 throughput.
c. The Projected Container Throughput and Capacity graph on Slide 31 shows a baseline (blue line), high (green line), and low (yellow line) projection for future container throughput. Following the baseline projection, Honolulu Harbor will have adequate capacity to handle container throughput until early 2040 with no changes in terminal operations. By early 2040, harbor capacity for container operations will have to be increased to make up the approximately 9 percent shortfall. This can be accomplished in a number of ways, such as by increasing yard area, increasing yard density by grounding and stacking containers, reducing dwell times, incorporating use of additional Ship-to-Shore (STS, also known as gantry) cranes or increasing productivity by increasing moves per hour. Making up 9 percent capacity is not difficult to achieve.

2. Slide Legend – The legend color scheme for the Sand Island, KCT and the Interisland Terminal Alternatives slides is as follows:
   a. Orange (berth/marine operations);
   b. Yellow (container storage, grounded/wheeled);
   c. Light purple (general storage and autos);
   d. Purple (truck gates/queuing);
   e. Blue (auxiliary facilities/buildings/labor-staff parking/chassis);
   f. Green (fishing operations); and
   g. Dark Red (maritime support).
3. Sand Island (Slides 33 – 35)
   a. Existing Conditions (Slide 33)
      i. Matson operations at Piers 51C to 53C are approximately 83 percent wheeled and 17 percent grounded. The overall sustainable capacity is currently constrained by a berth capacity of 780,000 TEUs, compared to available yard capacity of 900,000 TEU.
      ii. Pasha's current operations at Pier 51A is approximately 37 percent wheeled and 63 percent grounded. The overall sustainable capacity is currently constrained by a yard capacity of 330,000 TEUs, compared to a berth capacity of 340,000 TEUs.
      iii. Current overall sustainable capacity at Sand Island Is 1,110,000 TEUs.
   b. Sand Island 2050 Alternative 1 – Container and Auto/RO/RO Operations
      i. The harbor wide growth rate to 2050 for containers were applied to Matson's 2017 throughput to determine the target capacity for 2050.
      ii. Target sustainable capacity for containers = 1,300,000 TEUs and for autos = 85,000 units.

iii. Total terminal area is 165 AC, excluding the annex area. Under this alternative, the total area allocated for container storage is 72.8 AC and for cargo/auto storage is 12.5 AC.
iv. Recommendations:
- Balance berth and yard – Increase the number of gantry cranes to between 7 and 9 by 2050 to accommodate 1.3 million TEUs. [Note: Improved efficiency of new RO/RO vessels for loading/offloading may increase berth capacity without the need for additional gantry cranes.]
- Densify the yard by increasing the percentage of grounded containers from 17 percent to 42 percent, with a corresponding reduction in wheeled operations from 83 percent to 58 percent.
- Allocate 12.5 AC for autos (85,000 units per annum) and project cargo. The site plan shows the acreage at Pier 51A, but it can go anywhere in the yard based on the Operator's requirements.
- Improve truck gates and internalize truck storage to eliminate queuing on Sand Island Parkway.
- Relocate buildings that are near the end of their service life to the perimeter of the yard and relocate office buildings to an off-site location to maximize yard area and improve operational efficiency.
- Consider repurposing the existing Sand Island weigh station to serve as a joint-agency shared inspection station. The weigh station will become obsolete with the imminent installation of weigh-in-motion technology at each of the cargo terminals.

v. With these recommendations, between 25 and 30 percent of the terminal is still allocated for auxiliary space (parking, miscellaneous buildings, maintenance, and/or storage). The industry standard for auxiliary space is typically 10 to 15 percent of the total terminal area, so some of this space could be allocated to container storage to reduce the overall proportion of grounded containers.

c. Sand Island 2050 Alternative 2 – Containers Only
i. The same growth and capacity assumptions apply to this alternative. This alternative assumes that no auto operations will be conducted on Sand Island. As a result, operations would need to densify, but not as much as under Alternative 1. In Alternative 2, the percentage of grounded containers would increase from 17 to 31 percent, with wheeled operations decreasing from 83 to 69 percent.
ii. Total terminal area is 165 AC, excluding the annex area. Under this alternative, the total area allocated for container storage is 80.2 AC.
iii. Auto operations would be handled at one of the general cargo piers.
iv. All other recommendations are the same as Alternative 1.

4. KCT & Interisland Terminal (Slides 36 – 43)
a. KCT and Interisland Terminal – Existing Conditions

i. Upon opening in 2024, KCT will be primarily a wheeled operation, roughly 75 percent wheeled and 25 percent grounded. The overall sustainable capacity will be constrained by the yard to 430,000 TEUs, compared to planned berth capacity of 770,000 TEUs with 5 gantry cranes in operation.
ii. The Interisland Terminal is currently 100 percent grounded operations. Overall sustainable capacity is constrained by the yard to 180,000 TEUs, compared to a sustainable berth capacity of 290,000 TEUs.
iii. Current overall sustainable capacity of KCT and Interisland Terminal combined is 610,000 TEUs.

b. KCT 2050 (Slides 37 – 39)
   i. Assumptions:
      - KCT will handle cargo operations currently handled at Pier 1 and Pasha's Sand Island Terminal.
      - The harbor wide growth rate to 2050 for containers were applied to Pier 1 and Pasha's 2017 throughput to determine the target capacity for 2050.
      - Target sustainable capacity for containers = 650,000 TEUs
   ii. Total KCT terminal area is 85 AC. Total container storage area is 61.8 AC.
   iii. Recommendations:
      - Increase yard capacity to balance berth and yard. For container-only operations, densify yard by increasing percentage of grounded containers from 25 to 78 percent by 2050.
      - If auto operations currently handled by Hawai'i Stevedores at Piers 1 and 2 are relocated to KCT, then approximately 9.5 AC will need to be set aside for auto/project cargo storage and the container yard would need to be further densified to 100 percent grounded operation with containers stacked 4 to 5 or higher.

c. Interisland Terminal 2050 (Slides 38 – 43)
   i. Assumptions:
      - The harbor wide growth rates to 2050 for containers and autos were applied to the YB's 2017 throughput to determine the target capacity for 2050.
      - Target sustainable capacity for containers = 250,000 TEUs.
      - Target sustainable capacity for autos = 60,000 Units.
   ii. Approximately 12.7 AC is allocated to container storage, 4.5 AC for Less-Than-Container-Load (LCL) cargo, and 5.9 AC for project cargo and auto storage.
   iii. Recommendations:
      - Infill slipway at Pier 39 and 40 to create more yard space, yet retain berthing for 4 barges.
      - Reconstruct, raise, strengthen and improve all piers and yards to accommodate container storage and handling to the full extent of

the pier. Consider sheet pile/bulkhead construction. Improve fendering and bollards.
- Reconstruct, raise and strengthen pier at Kapālama Canal outlet for resiliency and terminal function.
- Relocate all buildings to perimeter of the yard or to an off-site location to improve operational efficiency. This would free up space for more auto storage.
- Internalize truck queuing to eliminate traffic impacts on adjacent public streets.
- Create a new Libby St. entrance for staff and customers, which would be outside of the secured area.
- Provide internal truck queuing adjacent to Auiki St.
- Consider one-way in and one-way out vehicle circulation.
- Consider relocating livestock and/or LCL operations to an off-site location, such as the Triple-F Building near KCT or another nearby site.

iv. Reconstructing and strengthening the piers and infilling the slipway would allow full use of the pier and yard area and would accommodate sustainable capacity of 250,000 TEUs by 2050 based on 100 percent grounded operation.

Discussion:

- There were no comments and questions made by PAC participants on this section.

MeetingSift Comments and/or Questions:

- *(Slide 40) KCT and Interisland Terminal slide: FEMA concurs with hardening and increasing height of piers.*

5. 2050 Container and Auto Terminal Overview (Slides 44 – 46)
   a. The 2050 projected throughput for containers is 2,046,000 TEUs.
   b. With regards to sustainable capacity in 2050, utilizing Pier 1 as a container terminal is not necessary as Sand Island, KCT, and the Interisland Terminal combined exceed the projected 2050 throughput.
   c. Projected 2050 throughput for autos is 225,000 units, which would require 16.3 AC of area. There is ample space to handle this throughput within the harbor. One alternative could have all autos be solely allocated to Pier 1. Another alternative would be to have all autos split between Piers 20 and 33.
   d. Projected 2050 container throughput (TEU) and sustainable capacity is shown in the following table:

Honolulu Harbor 2050 Throughput and Sustainable Capacity (TEU)	
2050 Projected Throughput	**2,046,000**

2050 Sustainable Capacity	
Sand Island	1,300,000
KCT	650,000
Interisland Terminal	250,000
Total 2050 Sustainable Capacity	**2,200,000**

Discussion:

- *Are you considering eliminating foreign inbound cargo off of Piers 1 and 2?*
  - Piers 1 and 2 will remain as a flexible cargo pier, but we know that the majority of the current operations are planned to be moved over to KCT. But the primary function of that pier will remain a cargo and resiliency pier. It will be able to handle auto, RO/RO, break bulk, and cargo in the future.

MeetingSift Comments and/or Questions:

- *(Slides 29 – 46) Various harbor cargo and support activities are well thought of and structured.*
- *(Slide 46) Inbound foreign cargo will need slightly different handling at KCT or Sand Island terminals as it may impact domestic cargo flow. .*

F. Piers 12 to 38 (presented by Jim Niermann, RMTC) Presentation Slides 47 – 67.

1. Piers 12 to 38 Overview (Slides 47 – 56)
   a. Piers 12 to 38 contain most of the maritime support operations and where the maritime support recommendations are focused. This area also includes the general cargo piers at Piers 19 and 20, 29, and 31 to 34 and the fishing fleets at Piers 16 to 18 and Piers 36 to 38. The area is separated by the privately-owned fuel facility at Pier 30.
   b. General recommendations for this area include:
      i. Improve cargo piers for mixed-use cargo operations.
      ii. Create opportunities for maritime tenants through long-term lease agreements, public private partnerships and capital advancement program funding.
      iii. Develop dedicated tugboat pier - “Tug Row” at Piers 21 and 22.
      iv. Develop new maritime center at Piers 22 and 23.

v. Remove warehouses, silos, and miscellaneous buildings at Piers 19 to 23 and Piers 31 to 33.
vi. Install permanent, landscaped infiltration trenches for dewatering construction projects within the ‘Iwilei District Participating Parties (IDPP) operating units to mitigate groundwater contamination and reduce Clean Water Act permitting requirements.

c. Recommended Access Improvements
i. Maintain access through the fishing village with connections at the existing full-movement signalized intersections at the Pier 38 Driveway and Alakawa St. on Nimitz Hwy.
ii. Create a new access driveway to Piers 31 to 34 with connection to signalized intersection at Alakawa St. and Nimitz Hwy. This alternative requires acquisition of the Honolulu Freight Services parcel.
iii. No changes are proposed to the two existing access driveways to Piers 31 to 34. These driveways will continue to be east-bound right-in and right-out only.
iv. Re-authorize and reconstruct the east-bound highway exit lane with connection to the Pacific St. intersection and access to Piers 27 to 29. At the Pacific St. exit, container trucks leaving Pier 29 are permitted right-out only to avoid blocking the Pacific St. intersection.
v. Reauthorize the driveway entrance at Pier 23 to provide right-turn-in only access to Pier 21, “Tug Row,” and to maritime uses and the proposed Maritime Center at Piers 22 to 23.
vi. Develop the existing Piers 21 to 23 driveway entrance as a primary access to the new Maritime Center and Piers 19 and 20 cargo terminal. Signalize the intersection. Coordinate with DOT-HWY for a signalization warrant study.
vii. Maintain the existing driveway access to the Piers 19 and 20 cargo terminal and Hawai‘i Pilots at Pier 18. Maintain existing driveway access to Piers 16 to 18 Fishing Fleet.

2. Piers 36 to 38 – Fishing Village (Slide 57)
a. Extend pier improvements at Pier 38 for fishing vessel off-load and provisioning and for layberth. This will add approximately 630 LF of new berth for shallow-draft vessels.
b. Develop new pier adjacent the maritime support area for work boats and layberth. This will add approximately 330 LF of new berth for shallow draft vessels.
c. Consider reconstructing the existing fuel barge pier. The fuel barge is nearing the end of its useful life and may be replaced. The fuel barge can be moved to another layberth location. It is not dependent on the current pier location.
d. Consider floating dock design for fishing vessels and work boat piers. Floating docks are less expensive to construct and may be more resilient to tidal fluctuations and outfall from Kapālama Canal.

e. Extend Pier 36 to the federal project limit. This will add approximately 320 LF of new berthing for fishing vessels and work boats. This recommendation is not a high priority.

Discussion:

- *With regards to the fuel barge pier, the area is shallow once you go beyond Young Brothers (YB) barge. Having fishing vessels here would be undesirable because of the impacts to fishing vessels from propeller and thruster wash from tugboat operations.*
- *Has Hawai'i Gas disclosed that they will eliminate the fuel barges?*
  - The two existing fuel barges will come to the end of their useful life before 2050. They will likely be replaced, but they are not location dependent. They can be berthed in another location in Honolulu Harbor or possibly moved to Kalaeloa Harbor. The current fuel barge berth can be redeveloped or repurposed for other vessels.
- *With regards to propane barges, Hawai'i Gas would still need the barges for interisland transportation and deliveries. Whether they use the barges or change to intermodal, there will be some need for the barges. If they maintain the barges or replace them, they would only need layberth space. If layberth can be replaced elsewhere then this would be fine.*

MeetingSift Comments and/or Questions:

- (Slide 57) *Though FEMA agrees it's a low priority, FEMA concurs to extend Pier 36.*

3. Piers 19 to 33 (Slides 58 – 62, and 65)
   a. Cargo Piers (Piers 19 and 20, 29, and 31 to 34)
      i. Clear and improve cargo piers for general purpose mixed-cargo operations.
      ii. Remove buildings, create open, flexible pier and yard space.
      iii. Provide storage for large/heavy maritime cargo handling and servicing equipment.
      iv. At Pier 29, improve the pier face and apron to an approximately 50-FT width. Fill the existing notch in the apron.
   b. Maritime Center
      i. Develop multi-level, mixed-use structure to accommodate office, ship agents, parking, auto storage, and cargo operations at ground level. Incorporate existing McCabe building.
      ii. Include commercial/retail on Nimitz Hwy. frontage.
      iii. Provide storage area for large/heavy maritime cargo handling equipment and emergency equipment.
      iv. Integrate parking and auto storage with Piers 19 and 20 cargo operations.
      v. Reauthorize driveway to provide primary access to Tug Row and new Maritime Center with one-way right turn in from Nimitz Hwy.

vi. Develop two-way driveway access to Maritime Center and Cargo Yard with signalized intersection on Nimitz Hwy.
vii. Examples of the type of structure being contemplated for the Maritime Center include Walmart on Keʻeaumoku St. and the Airport industrial Center (Slide 61).

c. Tug row at Piers 21-22
   i. Demolish existing buildings and consolidate tug operators in new shared office, warehouse, parking and maintenance facilities.
   ii. Reconstruct and strengthen pier, apron, and yard.
   iii. Consider sheet pile/bulkhead construction.
   iv. Provide shoreside power.
   v. Reauthorize driveway on Nimitz Hwy. to provide primary access.
   vi. Phase improvements so as not to disrupt tug operations.
d. Consolidate Maritime Operators in shared facilities where possible. Recommend long-term leases to facilitate tenant investment in harbor facilities. Consider public private partnerships as an alternative method of funding.
e. Relocate the Honolulu Marine drydock from Pier 27 to Pier 26 with a storage area at end of Pier 25 and 26.

Discussion:

- *How long until the buildings be removed at Tug Row?*
  - Based on preliminary phasing, building removal will be planned and conducted during the 0-10-year phase.

MeetingSift Comments and/or Questions:

- (Slide 58) *Is the consideration to revamp Pier 19 as a multi-use pier to accommodate non-cargo operations, such as small cruise ships, been eliminated as not feasible?*
  - Yes. The proposal to use Piers 19 and 20 as an additional cruise ship terminal or overflow berth for cruise ships was eliminated from further consideration coming into the PAC #2 meeting. [Note: The Project Team is reconsidering use of Piers 19 and 20 as a cruise ship berth and/or passenger terminal based on discussions at the PAC #2 meeting.]

4. Piers 22 and 23 (Slides 63 – 65)
   a. Reconstruct the pier due to its dilapidated condition and to strengthen the foundation for construction of the Maritime Center.
   b. Clear out subsurface coral and rocks and cut back pier face by 20 to 40 FT to widen slipway.
   c. Dredge full extent of the slipway to 35-FT depth.
   d. Demolish silos, warehouses and miscellaneous buildings to accommodate driveway access, and efficient layout of yard area for maritime uses.
   e. Reauthorize driveway access on Nimitz Hwy. to provide primary access to Piers 21 and 23, and to proposed Maritime Center.

f. Improve Pier 23 for use by maritime tenant and as layberth.
g. Existing silos and related structures constrain efficient use of Piers 22 and 23.
h. Existing space between the pier face and silo buildings is limited.
i. With the silos, the reconstructed pier would further reduce functional maritime use area.
j. Removing the silos and related structures adds 110 FT of additional width adjacent to the pier face and thereby improves yard efficiency.
k. The overall objective of widening the slipway, reconstructing the pier and clearing the silos is for the benefit of a maritime operator to utilize the space with limited constraints.
l. The Benefit Cost Ratio (BCR) of these improvements needs to be assessed before committing to the improvements.

Discussion:

- *In cutting back the pier face, is there any possibility of contaminated soils?*
  - Yes, there are known contaminants in the silos and structures, soils, and groundwater which would require mitigation.
- *What's the motivation for widening since PSI isn't going anywhere?*
  - The initial thinking is to create more functional space for berthing and for maritime operators to better use Pier 23. The objective is to make Pier 23 more usable for a maritime operator so they will not be constrained by PSI's operation.
- *Taking down the grain silos seems feasible but the costs of widening the dock seems like an expensive venture and to what extent? Who would you spend this for?*
  - We don't have a clear answer for this as of now. The intent was for use by the water taxi as a possible tenant there, but they are pretty mobile. Essentially, we have a valuable port facility in Pier 23 that is not being utilized and we're looking at ways to make it usable.
- *Was there consideration of taking Pier 25 dogleg out? A cost-benefit analysis will need to be performed. It's as if the people who came up with the design must have been in a bar when they designed it.*
  - Yes, this was considered, but was eliminated from HHMP consideration due to costs and due to PSI's long-term lease.
- *Will taking the Pier 25 dogleg out be any benefit for Piers 22 and 23 as well?*
  - Yes, in terms of vessel movement it would be helpful, doing a straight line is better than doing an angle. You can use the whole length of the pier for layberth with a straight-line berth.

MeetingSift Comments and/or Questions:

- (Slide 63) *The reason to address Pier 22 is because of its poor condition and for safety.*

5. Piers 16 to 18 – Fishing Fleet (Slide 66)
   a. Develop a new respite center and office/storage building at Piers 16 to 18. The respite center would be similar to the one on Pier 38.

   Discussion:

   - *Pier 17 is fully utilized. Recommend widening Pier 16 to accommodate motor vehicles. Currently Pier 16 is not wide enough to accommodate motor vehicles which prevents the pier from being utilized for vessel provisioning, fueling, and repair.*
     - The Project Team will include this recommendation for consideration in the HHMP. It sounds like a good idea to improve the functionality and efficiency of the pier.

6. Piers 12 to 15 (Slide 67)
   a. Piers 12 to 15 will continue to be used for maritime support operations.
      i. Pier 15 – Harbor Police
      ii. Piers 13 and 14 – Maritime Tenant
      iii. Pier 12 – Layberth or Maritime Tenant.
   b. Recommend long-term leases to facilitate tenant investment in harbor facilities.

   Discussion:

   - *From a resource standpoint, Pier 12 is the original last bedrock margin of the harbor, so it has a lot of coral. A lot of that area is original shoreline.*
     - The coral blocks at the tip of that area were repurposed from the original Fort at Fort St. and are historic .

G. Break

H. Aloha Tower Marketplace Area (Piers 2 to 11) (presented by Laura Mau, RMTC) Presentation Slides 68 – 80.

1. Historic Context
   a. Honolulu Harbor is recognized for its long history in maritime use and pre-maritime Hawaiian cultural resources and practices. Notably, the area located mauka (north) of the Aloha Tower Marketplace Area was referred to as Kuloloia Beach and its surrounding areas included a rich history of Hawaiian cultural resources and practices.
   b. A map was presented depicting the current shoreline surrounding the Aloha Tower Marketplace Area overlain by a historical shoreline map from 1810 (see Exhibit A). This recognizes the pre-maritime historic context of the area and changes to the shoreline for maritime purposes. The historical map was previously shared by Mr. Manny Kuloloio (lineal descendant with ancestral ties to the area) and added to the sequence of slides during the meeting.

c. The HHMP will consider how best and most appropriately to incorporate the history of Honolulu Harbor and historic context of the Aloha Tower Marketplace Area within the harbor.

2. Piers 9 to 11 (Slide 70)
   a. Pier 11 – Retain DOT-H offices.
   b. Pier 10 – Retain cruise operations or phase out and relocate to Piers 1 and 2. (Note: Refer to Section J, Piers 1 and 2 and Pier 60.)
      i. Integrate commercial/retail use, subject to:
         - Preparation of a structural integrity study to determine if the existing building can accommodate any additional renovations; and
         - Consultation with the DLNR State Historic Preservation Division (SHPD) as the Piers 10 and 11 sheds are considered historic structures.
      ii. Relocate existing parking to Piers 5 and 6.
   c. Piers 10 and 11 – If parking is retained, consider mechanical parking option to minimize the parking footprint.
   d. Piers 9 to 11 – Maintain waterside for continued layberth and/or maritime use.

   Discussion:
   - *If the Pier 10/11 shed is to be used for continued cruise operations, it needs to be redeveloped/improved for truck access and provisioning.*

3. Pier 8 – Maintain waterside for day excursion and maritime use.
4. Irwin Park – Restoration plans are proceeding under Aloha Tower Development Corporation (ATDC) management.
5. Pier 7 (Slide 71) – Reserve for a maritime tenant under a long-term lease). Also consider:
   a. Cultural landside use;
   b. Layberth and/or low traffic maritime use; or
   c. Alternate waterside use.

   Discussion:
   - *What are the plans for the Maritime Center on Pier 7?*
     - The DOT-H is negotiating a long-term lease for a maritime tenant on the landside, the building only.

6. Piers 5 and 6 Peninsula (Slide 72)
   a. Multi-story, Mixed-use Structure;
   b. Cultural Center;
   c. Educational Science Center;
   d. Commercial/Retail (to support economic development as a priority for ATDC);
   e. Office;
   f. Parking;
   g. Rooftop Garden (and Green Space Where Possible);

h. Retain Day Excursions; and
i. Limit Berthing and Waterside Usage off Pier 6 (in consideration of the coral replanting area located near the south end of the pier). [Note: The coral transplantation site is imprecisely marked on the PowerPoint presentation slide. The coral transplantation site does not wrap around the dolphins but will be proximal to the makai end of the Pier 5-6 peninsula.]

7. Mini Park
   a. Multi-Story, Mixed-Use Concept (Similar to Piers 5 and 6, except lower in height.)

   Discussion:

   - *This is one place that's non-maritime, and the PAC participants and the Project Team have a real opportunity to do something special with this place. Please do not eliminate green space. Locals and visitors are attracted to green space, and it may also address some environmental concerns.*

8. Alternatives and access options considered for Piers 5 and 6 Peninsula, and Mini Park: (Slides 73 – 77)
   a. Alternative A – Maintain Separate Parcels
      i. Access Option 1: Retain existing circulation in Aloha Tower Marketplace area
         - Retain two-way circulation on Aloha Tower Dr. and Bishop St.
         - Retain ingress from Ala Moana Blvd. to Aloha Tower Dr.
         - Retain egress from Aloha Tower Dr. to Ala Moana Blvd.
         - This option does not optimize buildable area.
      ii. Access Option 2: One-way circulation around Irwin Park
         - Retain partial two-way pattern on Aloha Tower Dr.
         - Retain ingress from Bishop St. and Richards St. to Aloha Tower Dr. (Eliminate egress from Bishop St.).
         - Retain egress from Aloha Tower Dr. to Ala Moana Blvd. (Eliminate ingress from Aloha Tower Dr.).
         - Add perimeter parking around Irwin Park.
         - This option does not optimize buildable area.
   b. Alternative B – Consolidate Parcels
      i. Close east segment of Aloha Tower Dr. or consolidate parcels at the ground level.
      ii. Modify east-bound egress from Aloha Tower Dr. to Ala Moana Blvd.
      iii. Optimize ground floor buildable area.
      iv. Access Option 1: Retain two-way circulation on Aloha Tower Dr.
         - Retain ingress from Ala Moana Blvd. to Aloha Tower Dr.
         - Retain egress to Ala Moana Blvd. from west end of Aloha Tower Dr. and Bishop St.

- Modify east-bound egress from Aloha Tower Dr. to Ala Moana Blvd.

v. Access Option 2: Partial two-way pattern on Aloha Tower Dr.
- Retain ingress from Ala Moana Blvd. to Aloha Tower Dr. from Bishop St. and Richard St.
- Retain egress to Ala Moana Blvd. from Fort St.
- Modify east-bound egress from Aloha Tower Dr. to Ala Moana Blvd.
- Add perimeter parking around Irwin Park.

9. Rough parking estimates were prepared as a general guide to envision how existing and potential parking needs may be accommodated, should parking be provided under two hypothetical scenarios: 1) Piers 5 and 6 Peninsula; and 2) Consolidate Piers 5 and 6 and Mini Park. The estimates were based solely on a preliminary parking program and will be revisited as the land use program is developed. The future development program and parking needs will be influenced by the proximity of the proposed Downtown Rail Station, technological advancements in vehicular transportation, and improvements in ride- and car-sharing opportunities.
   a. ATDC's lease agreement with Hawai'i Pacific University (HPU) includes the provision of 840 parking stalls, although the current parking inventory includes only 675 stalls located at Piers 5 and 6, Mini Park, HECO fronting Aloha Tower Dr., Irwin Park, and Piers 10 and 11.
   b. Under Scenario One (Piers 5 and 6 Peninsula), the estimated buildable area may be 2.7 AC, which may accommodate approximately 235 stalls per level. The current inventory of 675 stalls could be accommodated within three levels of parking.
   c. Under Scenario Two (Consolidate Piers 5 and 6 and Mini Park), estimated buildable area may increase to 4.2 AC, which may accommodate 365 stalls per level. The 840 stalls per ATDC's lease agreement could be accommodated within two levels of parking.
   d. Under a hypothetical future development program assuming the need for 1,000 stalls, five levels of parking may be needed for Scenario One, vs three levels for Scenario Two.

ROUGH PARKING ESTIMATES (Based on Parking Program Only)		
	Piers 5/6 Peninsula	Consolidate Pier 5/6 Peninsula & Mini Park
Rough Estimated Buildable Area	2.7 ac	4.2 ac
Parking Stalls Per Level	235	365
Target: 2 Levels	470	730
Target: 3 Levels	705	1,095
Target: 4 Levels	935	1,460
Target: 5 Levels	1,175	1,825

PARKING COUNTS	
Existing Parking Inventory	675 stalls
Req. Per Lease Agmt.	840 stalls
Future Development	1,000 stalls

Discussion:

- *How do the new parking projections compare with what's currently there?*
  - The existing parking inventory, which includes the Piers 5 and 6 peninsula lot, Piers 10 and 11, Irwin Park, Mini Park, and the parallel and perpendicular stalls adjacent to the HECO structure, provides 675 stalls. If DOT-H were to move all of those to a new structure, they would need 3 levels of parking just on the peninsula or two levels of parking for the consolidated scenario. As the Project Team develops the different scenarios, they would need to consider the appropriate programming purposes and use of retail space.
- *Will the long-term tenant at Pier 7 have their own parking or will they also be sharing the collective parking?*
  - Their parking will be part of the overall plan. There's a lease agreement with HPU to provide a certain number of stalls.
- *CCH Department of Planning and Permitting (DPP) has an ordinance in front of City Council right now to eliminate minimum parking requirements to leave it up to the market and developers to decide how much to build. DPP found that the Ala Moana area has built too much parking and are still building more. DPP hopes to shift the market a little bit. By the time this property is developed, there may be less interest in all that parking from an economic standpoint.*

Factors that could lead to parking becoming obsolete in the future (10 to 15 years) will include rail and autonomous vehicles, so consider that in your plans.

- *The potential for this space from an urban design perspective is that it could be one of the coolest places where people want to be. Looking at other cities, good retail and restaurants are typically a block away from rail stations or shorelines, so creating a parallel road to Ala Moana Blvd. could be the coolest place to develop, even if it's eating some of your real estate. It could be where people would want to hang out.*
- *Do the parking counts tie into the phasing out of the cruise activity on 10 and 11?*
  - Yes, possibly because the plan will offset the parking loss from 10 and 11.
- *Who are all these stalls for? Is the HHMP building parking for the HPU students? Why do the Project Team and PAC members want to encourage people to come downtown and park with the rail coming through?*
  - There are 840 stalls that are required under the current lease agreement with HPU (referencing Slide 78). What's actually in the inventory is 675 stalls. For our future development, the Project Team suggested 1,000 stalls, but to your points, the Project Team is not sure what the market will bear and what the programming will be.
- *Not having the rail on these plans seems like a glaring omission. The string of large concrete columns coming down Ala Moana Blvd. and the station that are to be built are going to drastically alter the landscape. Besides the columns and its elevated track, the Station with its stairwells, cross walks, elevators, and the rest will greatly affect Irwin Park, pedestrian crossings, parking, traffic flows, and all of the points under discussion. Additionally, the Chinatown station is a block away at Pier 15, which seems excessive.*
  - The Project Team has been in discussions with Honolulu Authority for Rapid Transportation (HART), but because HART's plans aren't definite, the Project Team decided not to include the rail footprint (station, touchdowns, columns, etc.) on the presentation figures. The Project Team acknowledged that the downtown station will be located between Bishop and Alakea Streets and that the touchdown at the corner of the HECO property seems to be the agreed upon location. Hopefully, by the next PAC meeting the footprint will be set, and the Project Team will be able to include more definitive HART plans along with the HHMP. Future exhibits will incorporate HART plans.
- *The HECO site and its demolition is going to be very expensive and cause a lot of problems to HART's plans and the HHMP if it doesn't*

fall within the right timeline. It's a big black hole that could present a lot of issues for CCH's other plans.

MeetingSift Comments and/or Questions:

- (Slide 77) *Has the Project Team looked at keeping the Ala Moana egress between the Mini Park and (Piers) 5 and 6 open and connecting the building on higher levels?*
  - The Project Team considered multiple scenarios and access options based on stakeholder feedback and research within the area. Alternative B, Access Option 1 and 2 (Slides 76 and 77) shows Piers 5 and 6 and the Mini Park connected at the ground level and developed with a parking structure that has vehicle egress on the Diamond Head side of the structure (via the Aloha Tower Dr. alignment) to Ala Moana Blvd. The height of the multi-story mixed-use structures will be determined by the developer(s), DOT-H, and feedback from the PAC participants.
- (Slide 78) *Yes more downtown parking!!!!*
- *More parking downtown would likely be of interest to the various federal tenants in the federal building.*
- *(Slide 77) Need a better understanding of where the rail lines and stations are going to be located, where the landings will go and what the development needs of the area are before our input can be meaningful to the Master Plan.*
- *Move Rail terminal from HECO towards Punchbowl and Channel Streets to help congestion and transportation for the Kaka'ako area.*
  - DOT-H has no control over where the rail station is located.

10. Pedestrian Improvements:
    a. Create pedestrian promenade along Aloha Tower Dr. and Piers 5 and 6.
    b. Remove street parking behind HECO.
    c. Widen frontage with access platform between Piers 4 and 5 (10 to 15 FT wide).
    d. Improve mauka to makai connectivity along Aloha Tower Dr., Bishop St., and Richards St.
    e. Add pedestrian swing bridge between Piers 6 and 7.
    f. Improve wayfinding.
    g. Add minimal landscaping and pedestrian improvements along the highway. This will require coordination with DOT-HWY.

Discussion:

- *Are the Pier 10 and 11 sheds untouchable? Do those structures have to be retained? Can they be modified at all? Cruise ships like berthing at Pier 10/11 as it provides easier access for their passengers to explore Downtown, but the ground area is terrible for getting trucks in for provisioning. If Pier 10/11 is not a viable cruise ship berth, what can be done with that space?*

- The Piers 10 and 11 sheds are designated historic, so it would require larger discussions and a study conducted to confirm the structural integrity and plan any potential renovations. Additionally, all the relevant parties—namely, HPU, its tenants, ATDC and DOT-H would need to coordinate to decide what could reasonably and responsibly be done with that space.

- *CCH is developing a signage plan for wayfinding. So far it includes a general concept plan. CCH's consultants for the Wayfinding Plan will be in town the first week of April and will be available to meet with anyone from the PAC who would like to meet with them and provide input. CCH is in the process of making the wayfinding signs and look forward to linking Chinatown to the Aloha Tower area.*
  - Elderly cruise passengers don't realize how far Chinatown is, and with the lack of signage and shade, sometimes the Emergency Medical Technicians (EMTs) are called to provide assistance to them.

MeetingSift Comments and/or Questions:

- (Slide 79) *Additionally need to add city bus stop/route information, bikeshare, and biking.*

11. Consider Pier 4 as a potential cruise ship visitor center due to its convenient location between the existing cruise ship terminal and Aloha Tower Marketplace.

Discussion:

- *The USCG requires the Pier 4 facility for its mission now and in the future. USCG's mission is growing in the Indo-Pacific region, and Honolulu/O'ahu is the hub for that mission and USCG's work. The future use of that facility is not entirely set in stone, and the USCG is reviewing multiple uses of the property and the building. Shared use of the waterfront with DOT-H is possible; the USCG welcomes DOT-H's proposal. The USCG is not able to divest that property at this time.*

12. FTZ parking lot and "ballpark" alternatives are:
    a. Joint development of a commercial, retail, and parking structure (several stories).
    b. Development of a low rise commercial, retail, and parking structure (as compatible with adjacent use).

    [Note: There doesn't seem to be any push for development of the "ballpark" and the FTZ parking lot, thus these ideas are no longer being considered for the HHMP.]

Discussion:

- *The Project Team might want to consider swapping the "ballpark" lot with the Feds for the GSA lot fronting Pier 2. One of the major utilizers of that lot is the USCG, so see if GSA is willing to trade with DOT-H.*

I. Considerations Presentation Slides 69 and 85 – 91.

Previous studies prepared for the Aloha Tower Marketplace Area identified several areas of concern that inhibited its development potential. With the exception of item 1, these considerations will be addressed, to the extent possible, by the HHMP alternatives being developed. [Note: Refer to Section H, Aloha Tower Marketplace Area (Piers 2 to 11), for ideas and alternatives related to the Aloha Tower Marketplace area.]

1. *Limited development potential without HECO property.* Because of its central location, the HECO property is key to the redevelopment potential of the Aloha Tower Marketplace area. However, the HECO site is not within DOT-H's control and therefore constrains what the HHMP can propose for the area without this key component.

2. *Lack of adequate, convenient parking.* Adequate and convenient parking is needed to support retail and commercial uses within the area. Historically, the lack of parking has been challenging, particularly in terms of attracting local residents. Alternatives to address this include:
   a. Consolidate parking at Piers 5 and 6.
   b. Explore options for mechanical parking where possible.
   c. Explore perimeter parking around Irwin Park.

3. *Traffic congestion during cruise ship port calls*. Alternatives to address this:
   a. Modify circulation patterns and turning movements along Aloha Tower Dr. and internal connector streets (i.e. Fort, Bishop, and Richards).
   b. Modify ingress and egress between Aloha Tower Dr. and Nimitz Hwy./Ala Moana Blvd.
   c. Pursue acquisition of GSA parcel at Pier 2 for vehicle parking and queuing.
   d. Reconfigure vehicular queuing and staging areas at Pier 2.
   e. Increase staging area for containers and service trucks, as well as passenger ground transportation at Pier 2.

4. *Inadequate connectivity to Chinatown, Downtown, and Kaka'ako exists due to the visual barrier created by Nimitz Hwy./Ala Moana Blvd.* Alternatives to address this:
   a. Create pedestrian promenade along Aloha Tower Dr.

b. Improve mauka to makai connectivity from Aloha Tower Dr. via Fort St., Bishop St., and Richards St.
c. Improve wayfinding.
d. Provide minimal landscaping and pedestrian improvements.

5. *Restricted access to shoreline.* Opportunities for public shoreline access are available, but limited. Access is otherwise restricted for most of Honolulu Harbor to ensure the security of maritime operations. Alternatives to address this:
   a. Create pedestrian promenade along the length of Aloha Tower Dr.
   b. Widen Aloha Tower Dr. with a waterside access platform between Piers 4 and 5 (approx. 10 to 15 FT wide).
   c. Maintain public shoreline access around Piers 5 and 6 Peninsula.
   d. Add pedestrian swing bridge between Piers 6 and 7.
   e. Restore pedestrian access along Pier 7.

6. *Irwin Park.* DOT-H is proceeding with plans to relocate parking and restore the park. The timing of these plans must be coordinated between the DOT-H, HPU and the Irwin Family Trust.

J. Piers 1 & 2 and Pier 60 (presented by Jim Niermann, RMTC) Presentation Slides 81 – 84 and 92 – 106.

1. Pier 2 Cruise Terminal Recommendations (slide 81):
   a. Acquire federal GSA lot and use the area to improve vehicle queuing, parking and motor vehicle circulation.
   b. Utilize approximately 0.5 to 1 AC of land area from the Pier 2 yard to increase the staging area at the makai side of the existing cruise terminal building to expand and improve circulation for containers and service trucks that service cruise vessels.
   c. Renovate the historic DOH building for maritime office use.
   d. Develop commercial/retail/parking structure at FTZ property and/or the baseball parking lot. [Note: This idea is no longer being considered.]
2. Pier 2 Cruise Terminal Scenario without acquisition of the GSA lot: (Slide 82)
   a. Utilize approximately 1 to 2 AC of land area at the mauka end of the Pier 2 yard to increase the staging area for passenger ground transportation.
   b. Reconfigure queuing and staging to improve circulation.
3. Utility Upgrades
   a. Provide shoreside sewer connection for cruise vessel discharge to municipal collection system.
   b. Improve shoreside water connection for cruise vessels to take on water (pressure and flow). Consider upsizing existing lines and providing pumps.
   c. Provide shoreside power to reduce carbon emissions from idling vessels.
4. Cruise Terminal Pedestrian Connectivity

a. Improve pedestrian connection between Aloha Tower Marketplace area and Pier 2 Cruise Terminal.
b. Work with the HCDA and Kamehameha Schools to improve pedestrian connections to Kaka'ako.
c. Consider developing new pedestrian connections through Pier 2 to Kaka'ako makai. [Note: This idea is no longer being considered due to conflicts with industrial maritime function of Pier 2.]

5. Piers 1 and 2 – Cargo and Resiliency Pier
   a. Reconstruct and raise pier and yard 8 to 10 FT above MLLW to serve as primary resiliency pier and multi-use cargo pier.
   b. Consider sheet pile/bulkhead construction. Include wave energy diffusion/absorption with pier design.
   c. Construct heavy lift pads and reinforced utility conduit for function as resiliency pier.
   d. Acquire 5 AC OHA parcel and 0.8 AC HCDA remnant to expand yard and improve operational function.
6. Pier 2 Consolidated Cruise Terminal
   a. Under a scenario where cruise terminal operations at Piers 10 and 11 are phased out over the next 5 to 10 years, and assuming that the State's policy will be to continue to accommodate 2 cruise ships simultaneously in Honolulu Harbor, the Project Team must consider alternatives for a second cruise berth elsewhere in the harbor. Piers 1 and 2 are the only viable options to accommodate two standard-sized cruise vessels simultaneously (Length = 965 to 1,150 FT, Beam = 125 to 150 FT).
   b. The State is planning to phase out cruise operations at Piers 10 and 11 for several reasons:
      i. Limited landside area and existing terminal building configuration constrains motor vehicle movement (ground transportation, provisioning and service vehicles).
      ii. The industry standard size of cruise ships is anticipated to increase in the future. The existing Piers 10 and 11 berth is constrained for berthing larger cruise vessels.
      iii. The landside area is under ATDC's jurisdiction. Part of ATDC's mandate is to redevelop the Aloha Tower Marketplace Area to its highest and best use to generate revenue to support Honolulu Harbor. When used solely as a cruise terminal, the space at Piers 10 and 11 remains idle and underutilized for much of the year and is constrained from being used for higher revenue generating uses. [Note: The ATDC is established by Hawaii Revised Statutes (HRS) Chapter 206J. As described in HRS 206J-1, ATDC's purpose is to undertake…"the redevelopment of the Aloha Tower complex to strengthen the international economic base of the community in trade activities, to enhance the beautification of the waterfront, and in conjunction with the department of transportation, to better serve

modern maritime uses, and to provide for public access and use of the waterfront property."]

c. Two standard sized cruise ships cannot berth at Pier 2 simultaneously without impacting operations at Pier 1 and/or Pier 4. Options that were considered to berth two vessels at Pier 2 include:
   i. Berth two 965 FT cruise ships at Pier 2. The makai ship would overhang the existing "knuckle" between Piers 1 and 2 and would require installation of a mooring dolphin at Pier 1, which would constrain vessel operations at Pier 1.
   ii. Demolish a portion of Piers 3 and 4 and extend the length of the Pier 2 berth. Under the scenario with a 965-FT cruise ship and a quantum class ship (1,150 FT length) berthed at Pier 2, one of the vessels would overhang the "knuckle" and, as above, require installation of a mooring dolphin at Pier 1 to secure the vessel to the berth. This option would necessitate acquiring Pier 4 from the USCG.
   iii. There is no viable alternative for berthing two standard sized cruise vessels at Pier 2 without impacts to Pier 1.
d. 2020 Cruise Ship Port Call Days include:
   i. 121 days at Pier 2
   ii. 29 days at Piers 10 and 11
   iii. 150 days total
e. If call cruise operations shift to Piers 1 and 2, then it is anticipated that Pier 1 will have to accommodate approximately 30 cruise ship calls per year. With a second home-ported ship at Honolulu Harbor, the number of cruise ship calls at Pier 1 would increase to an estimated 40 or 50 calls. [Note: Berthing analysis of Pier 1, based on DOT-H's 2017 and 2018 port call data, shows current Pier 1 utilization at approximately 30 percent. By 2050 the utilization rate increases to 51 percent, based on a projection of current operations. If Hawai'i Stevedores' cargo operations at Pier 1 move to KCT, as expected, the projected utilization rate would be lower. Based on these numbers, it appears that there is capacity at Pier 1 to accommodate 40 to 50 cruise ship calls per year.]
f. Pier 1 may be used for port calls or partial turns (up to approximately 500 passengers at most). It would not be used for full turns due to operational constraints.
g. Alternatives for berthing a cruise vessel at Pier 1 include:
   i. Shoreside operations need to have access to the middle third of the ship, with passenger access through a mid-ship door, baggage through a forward door and provisions through an aft door.
   ii. Temporary/Mobile Facilities
      a. All cruise facilities at Pier 1 facilities can be temporary and mobile.
      b. Use temporary barriers and awnings at pier side to stage passenger access, ship provisioning and baggage handling operations.

c. Stage ground transportation and provision/service vehicles pier-side (see Slide 99 for example from Helsinki and New Zealand).
d. And/or use temporary barriers to direct passengers to walk to the existing Pier 2 terminal building for processing (approximately 1,100 LF from mid-ship to the Pier 2 building).

iii. Limited Permanent Facilities
a. Construct an elevated walkway along a segment of Pier 1 outside of the apron with connection to the Pier 2 terminal building (see Slide 101 for an example from Port of Saint John, NB, Canada). The elevated walkway would have sufficient height to allow vehicles and container-on-chassis to pass underneath. Consider a retractable walkway. Consider installing the walkway up to the knuckle only.
b. Install a temporary, prefabricated sprung structure at pier-side or adjacent to the existing terminal building to handle passenger processing (security, health screening) and baggage handling. Consider installing the temporary structure during the Hawai'i cruise season, from September through May.

iv. Permanent Facilities
a. Construct a new cruise terminal building adjacent to and integrated with the existing terminal building. A new Pier 2 terminal building can handle passenger baggage. Passengers access between the cruise ship and terminal building can be either via temporary barriers set up across Pier 1, or a permanent, elevated walkway, or a combination of the two.

v. All facilities can be temporary and mobile (see Slide 103 for an example from Port of Los Angeles).

Discussion:

- *Piers 10 and 11 should still being considered as a possible cruise alternative. It might be a matter of staging buses someplace else such as Pier 19 to relieve the congestion. People still love to go to Piers 10 and 11. If the decision is to move all cruises to Piers 1 and 2, then the transition should be a smooth one. There would be a lot of things to work out including the movement of the ground transportation at Pier 2; transition to Piers 1 and 2 should not exacerbate existing cruise traffic problems or impact future growth.*
- *[Looking at slides 65 and 66] The ferry terminal building was designed to handle passengers. So instead of modifying Pier 1 to accommodate a cruise ship, you could add a mooring dolphin or a mooring platform off the end of Pier 21 at Tug Row to extend the berthing capacity at Piers 19 and 20. The Hawaii Pilots put 655-FT long car ships at the Piers 19 and 20 facing makai so their bows are just inside the corner at tug row. If you built a mooring/berthing platform about 300 FT off the corner of that dock, Piers 19 and 20 could accommodate a large cruise ship there by giving their bow*

something to tie up to or lean against safely, and they would still be able to accommodate two cruise ships on the same day. The Hawaii Pilots do about 3 or 4 car ships a month. And there's an existing passenger structure there already (i.e., The Super Ferry Terminal) to accommodate people getting off the ship. It would be easier to accommodate cruise ship at Piers 19/20 with less impact than having a cruise ship at Pier 1; move the autos to Pier 1 instead. Accommodating cruise vessels at Piers 19/20 is a doable plan with a relatively minor impact.

- *The proposed set up at Pier 1 really constrains and limits the cargo utilization. There's plenty of room at Pier 1 for RO/RO ships. Piers 10 and 11 can be kept for smaller ships. Cruise ships aren't coming every day, but cargo ships are. It's important to keep Pier 1 for cargo rather than cruises.*

MeetingSift Comments and/or Questions:

- *Using (Piers) 19 and 20 for cruises is a good idea. Assume it would cost less than redeveloping Pier 1 as a cruise terminal, but caution about the impression of the industrial setting on cruise visitors when they disembark.*
- *What is FTZ's long term plan? Could they move to the OHA property? Open up FTZ space to better use and more efficient use of passenger terminal.*
  - The Project Team assumes that the FTZ will remain at their existing Pier 2 location for the duration of the 2050 planning horizon.
- [Slide 93] *Car ships 3 times a month takes apron space 5 to 7 days each vessel visit.*
- [Slide 93] *Ship access for stores, baggage, pax may not line up if there is a large overhang.*
- [Slide 94] *Is there a potential revenue loss number if the cruise ships stop coming?*
  - The Project Team doesn't have a specific dollar number. We will look into existing, available research by the Department of Business, Economic Development and Tourism (DBEDT) or Hawai'i Tourism Authority (HTA) regarding the economic impact of the cruise industry.

7. Pier 60 (Slide 106)
   a. Raise the Pier 60 pier and yard and fill landside areas above the projected 2060 3.2-FT SLR.
   b. Pave and harden the HC&D yard surface for bulk aggregate storage.
   c. Develop the inland areas for car storage, container on chassis storage, chassis maintenance, or other maritime use.

d. Acquire right-of-way (ROW) to improve street layout/circulation and develop a new public access commercial street to create business frontage along the inland landside areas.

Discussion:

- There were no further comments and questions made by PAC participants on this section.

K. Preliminary Phasing and Potential land Transactions Presentation Slides 108 – 110.

1. The Project Team will present a preliminary phasing plan for review at the PAC #3 meeting. The following list is the Project Team's first pass at prioritizing major improvements into three, 10-year development phases. It is not based on DOT-H budget, financing or other considerations. PAC members are invited to review the preliminary phasing and provide feedback to the Project Team to help us develop the phasing plan.
   a. Phase 1: 0 to 10 Years
      i. Pier 1 Reconstruction
      ii. Interisland Terminal Improvements
      iii. Pier 21 "Tug Row" Improvements
      iv. Pier 51 Improvements
      v. Piers 19 to 23 Warehouse Removal
      vi. Piers 22 and 23 Reconstruction
      vii. Piers 52 and 53 Improvements
      viii. Pier 60 Improvements
      ix. Cruise Terminal Consolidation
      x. Non-Maritime Improvements
   b. Phase 2: 10 to 20 Years
      i. Demolish Silos
      ii. Pier 19 Maritime Center
      iii. Piers 19 and 20 Cargo Pier Improvements
      iv. Pier 29 Apron Reconstruction
      v. "Tyco Pier" – Layberth Construction
      vi. Pier 38 New Berth Construction
      vii. Non-Maritime Improvements
   c. Phase 3: 20 to 30 Years
      i. Pier 36 Extension
      ii. Entrance Channel Widening
      iii. Kalihi Channel Bridge Replacement
      iv. Non-Maritime Improvements

2. Potential Land Transactions (Slides 18 and 110)
   a. See discussion under item D.2. for more detail about the following potential land transaction areas.

i. Trading the KIPA for CCH Department of Land Management (DLM) / DLNR
ii. Hale Mauliola on Sand Island, 6 AC
iii. Servco Lot, 14.5 AC [Note: The State is no longer in negotiations with Servco for acquisition of the property.]
iv. DOA Driveway, 0.25 AC
v. Honolulu Freight Services, 5.5 AC
vi. HECO Parcel Near Pier 31, 2.3 AC
vii. USCG Pier 4, 1.2 AC
viii. Federal GSA Lot, 1.4 AC
ix. HCDA Land Strip, 1.4 AC
x. OHA, 5.5 AC
xi. Tyco Piers, 350 LF
xii. Pier 53, 350 LF

b. Land acquisition needs to be justified based on the needs of the harbor, as determined by operational requirements and/or projected cargo capacity throughput.

Discussion:

- *It doesn't seem like there's a connection between the phasing plan and the potential land transactions. Jim mentioned that DOT-H is not interested in disrupting the transitional housing program; how does this relate to phasing?*
  - Land transactions are in a classification of their own because they are not under our control; they require a negotiated outcome. The cargo projections show that Honolulu Harbor can meet the projected 2050 cargo needs within the existing harbor lands. The rationale isn't as strong as it may need to be to procure the additional parcels. If the conditions were such that the Hale Mauliola transitional housing program were to find another home, DOT-H would be interested in that land possibly for shared inspection facility or additional annex. It's not a high priority for DOT-H in relation to the other uses. It's just identified as having potential. If the opportunity to acquire comes up, it's logical to bring these sites under DOT-H jurisdiction.
- *There has been a lot of discussion about creating value for the leasable parcels for development. Particularly, the need for connections across Ala Moana Blvd. DOT-H needs to continue working with DOT-HWY to figure out how to create those connections and search for opportunities for bike connections through Aloha Tower Dr. There are also several places along Ala Moana Blvd. that need improvements. As development occurs, the CCH will require widened sidewalks. Looking for those opportunities with DOT-HWY is encouraged because there are at least 3 to 4 places where DOT-H should encourage people to take advantage of the waterfront access (e.g., Aloha Tower, UH Cancer Center, Luna Park, Kewalo Basin,*

and Ala Moana). People love to look at working waterfronts and opening those connections could allow thousands of tourists to bike to Aloha Tower area from Waikiki.

- The Project Team will need to test some of those ideas and opportunities with the PAC members when the opportunities arise.

End of Presentations

L. Closing Remarks from PAC Participants

- *It's looking great. Granted, there are a lot of things that still need to be ironed out, but it's come a long way.*
- *Good progress.*
- *Good process so far as you're looking at your phase one components. I think that understanding how phase one improvements will line up with USACE permits that might need to be applied for will help with resource agency engagement and coordination.*
- *Mahalo for all the work done. I hope next time we'll see the Rail plans incorporated into the HHMP.*
- *CCH-OCCSR looks forward to sharing resources to clarify comments.*
- *Appreciate all the engagement* and look forward to a fully operational *ATDC Board.*
- *Interesting and edifying as always. Thank you so much.*
- *Thank you for having us. This is really good information.*
- *Regarding the future of the Sand Island access bridge, what is its remaining life span? Whenever that lifespan comes to an end, it would benefit everyone to discuss other opportunities such as a tunnel or higher bridge for the purpose of protecting the resiliency of the harbor against all-natural disasters to preserve this immeasurably critical resource.*
- *Thank you to the team for putting in all the work and putting this together. This has been a lot of good information and you guys are doing a great job.*
- *DPP is working on a Preliminary Climate Adaptation Guidelines Literature Review and Interview Findings, so watch for that to be released in the next couple of weeks. There will also be a companion document coming out soon with design ideas.*
- *Thank you for bringing up Piers 19 and 20 for cruise.*
- *DOT-H Oahu District: Really appreciate everybody's participation, comments, and assistance in this process.*
- *Hope Derek has enough money for all of this.*

- *Appreciate the openness of the process and the planners and the willingness to look at the different suggestions. It's been a very enlightening process and thank you to all.*
- *Appreciate everybody's comments and the process that we've all gone through. I really liked the idea of looking at Piers 19 and 20. I did not know that was even on the consideration, so thank you for bringing that back up along with Piers 10 and 11 as well.*
- *Good process and planning process. This is great as always to get everybody together and their comments. There are two things on the plan that should be look at a little more. The bridge situation still needs to be figured out considering that the Harbor is so vital. The other piece is for Pier 1 to be reserved for cargo. The Maritime Center might be more difficult to develop for things other than auto storage. Pier 1 is good for cargo as its deep water, easy in and out. Keep cargo areas for cargo. Passenger ships are great, but there are other facilities that can take care of that.*
- *The Kuloloio 'Ohana supports the stevedores and Derek's mission. Also supports the state getting back Pier 4. Need to know how the USCG's obtained the space? Hawai'i should be what we would want it to be as some of our families will still be here. The overlay of the rail station was considered and the impact of that, because the station is going to be called Kuloloia. Bring back regattas in the harbor and explore other possibilities such as a place where people can swim and paddle in the harbor.*
- *Appreciate the methodical nature and that you've asked the PAC for input. In regard to what the USCG was saying, whatever ideas that pass through here, one must always think about Kalihi Channel and Sand Island Bridge being kept open. Closing the bridge or the Kalihi Channel will be a big mistake down the road. Keep the Honolulu Harbor's waterfront for waterfront businesses. The people that must be at the waterfront should have priority above everything else.*
- *Appreciate the reach out and agree (with the previous comments).*

M. Conclusions and Follow-Up

1. Preliminary integrated maritime and non-maritime alternatives will be refined based on input from PAC #2 and will be presented for additional input and refinement in future PACs and PIMs over the coming year.

2. The Project Team will follow up with the PAC to notify them of the availability of the PAC #2 meeting notes and future meeting dates. The PAC #3 meeting may be held in late July or August. The PIM will happen in May. [NOTE: Due to the government and community response to the COVID-19 pandemic, the PAC and PIM meeting dates will be postponed until the situation improves and normalizes.]

3. Any additional questions or comments can be sent through the Honolulu Harbor website and by phone or email to the Project Team. https://honoluluharbormp.com/pac

O. Officially adjourned (12:05PM)

Honolulu Harbor 2050 Master Plan
Planning Advisory Committee 2

Contact Last Name	Contact First Name	Sub-TAC Group	Email	Affiliation	Sign-in
Cook	Jim	Fishing Operations		POP Fishing and Marine	
Edwards	Ruby	Agency (State Office of Planning)		State Office of Planning	
Enos	Ed	Vessel Operations		Hawai'i Pilots Association	
Ensley	Kyle	Agency (U.S. Coast Guard)		U.S. Coast Guard	
Friel	Lek	At-Large (Matson)		Matson	
Funakoshi	Rodney	Agency (State Office of Planning)		State Office of Planning	
Gemeno	Blaine	At-Large (Sause Brothers)		Area Manager, Sause Bros.	
Gonser	Matt	Adaptation & Resiliency		City and County of Honolulu (CCH), Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management	
Grune	Randy	Cargo Operations		PASHA/Hawai'i Stevedores	
Harter	Bob	Adaptation & Resiliency		City and County of Honolulu (CCH), Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management	
Haynes	Tracy	Adaptation & Resiliency		Federal Emergency Management Agency	
Heberle	Tom	Vessel Operations		Hawai'i Pilots Association	
Hong	Glenn	At-Large		Former Maritime Executive	
Kamemoto	Garett	Agency (HCDA)		Interim Director, HCDA	
Kaanehe	Blue	Agency (DLNR)		Administrator, DLNR	
Kuloloio	Manuel	Non-Maritime Opportunities		Kuloloio Ohana	
Lu	Kim	Fishing Operations		VAK Fisheries, LLC/Boat Owner @ 16-18	
Lum	Traci	Agency (DOT-STP)		DOT-STP	
Martin	Christy	Environment		Coordinating Group on Alien Pest Species	
Martin	Sean	Fishing Operations		POP Fishing and Marine	
Moku	Sam	Non-Maritime Opportunities		Hawai'i Pacific University	
Murata	Masatomo	Agency (DOT-STP)		DOT-STP	
Nikaido	Blayne	Agency (DOT-STP)		DOT-STP	

Honolulu Harbor 2050 Master Plan
Planning Advisory Committee 2

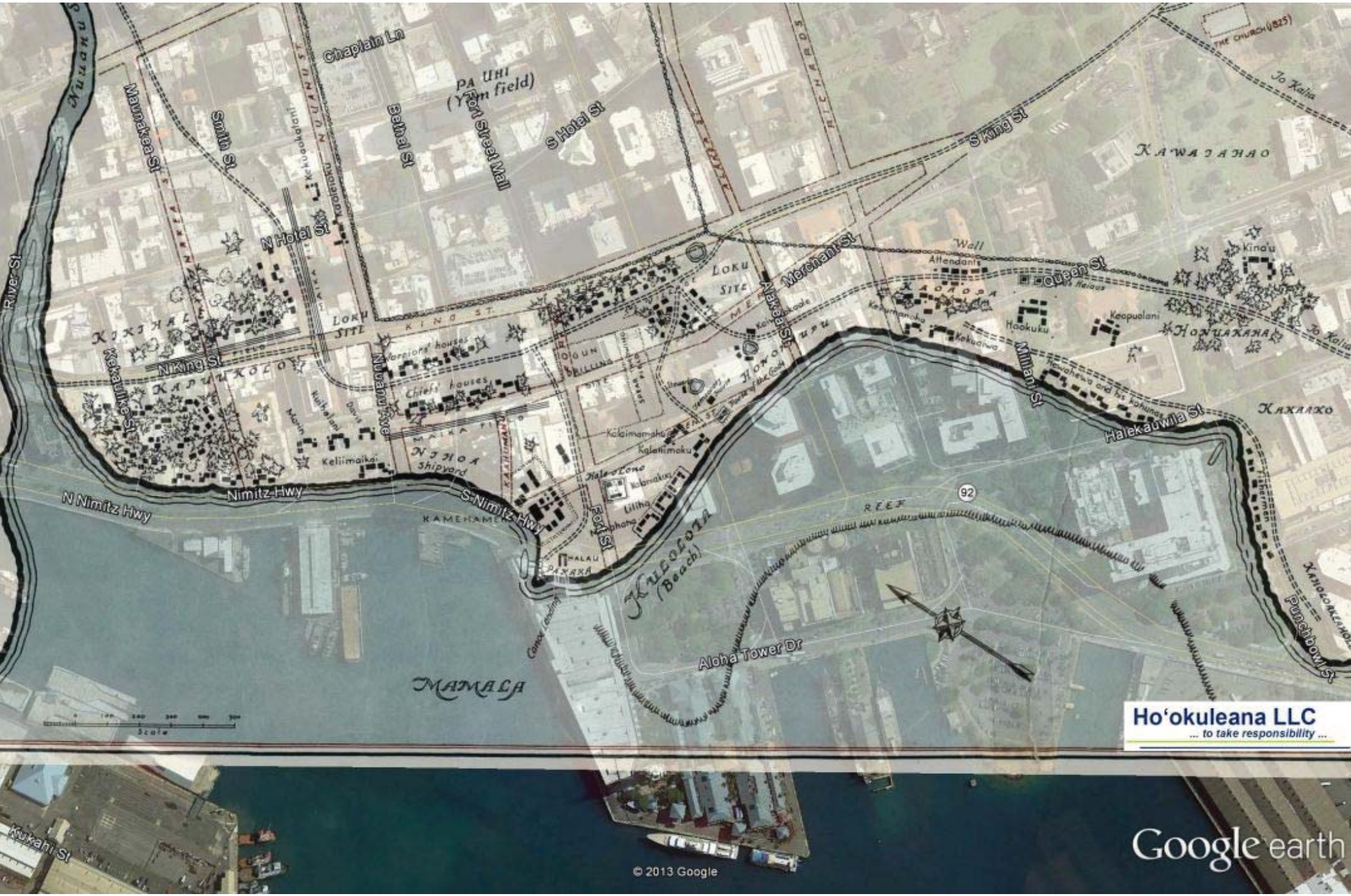
Contact Last Name	Contact First Name	Sub-TAC Group	Email	Affiliation	Sign-in
North	Gary	At-Large (HHUG)		HHUG	
Oh	David	At-Large (PAR Hawaii)		Marine Operations Manager, Par Hawaii	
Olson III	Whit	Vessel Operations		FOSS Maritime	
Pillone	Peter	At-Large (DOT-H)		Commercial Harbors Manager, Oahu District	
Polhemus	Dan	Environment		US Fish and Wildlife Service	
Rocheleau	Andrew	Maritime Support		Sea Engineering	
Rue	Harrison	Agency (CCH, DPP, TOD)		City and County of Honolulu, Department of Planning and Permitting, Transit-oriented development	
Schilling-Wheeler	Noelani	Cruise & Excursion Operations		Oahu Visitors Bureau	
Sikkink	David	Agency (DBEDT-Foreign Trade Zone)		Administrator, DBEDT-Foreign Trade Zone	
Stanton	Colby	Adaptation & Resiliency		Federal Emergency Management Agency	
Takekawa	Neil	At-Large (DOT-H)		Oahu District Manager, Oahu District	
Toguchi	Charlie	Cruise & Excursion Operations		Norwegian Cruise Lines	
Tsuji	Russell	Agency (DLNR)		Administrator, DLNR	
Whalen	John	Agency (HCDA)		Chair, HCDA	
Whitworth	Tiffanie	Maritime Support		Young Brothers	
Williams	Josh	Agency (U.S. Coast Guard)		U.S. Coast Guard	signed by Rep
Yocum	Janet	Adaptation & Resiliency		Federal Emergency Management Agency	
Zane	Jimmy	Cargo Operations		McCabe Hamilton & Renny Co.	
DOT-H Property Managers					
Leong	Eric	DOT-H, Property Manager		DOT-H, Property Manager	
Pham	Olivia	DOT-H, Property Manager		DOT-H, Property Manager	
Savusa	Joni	DOT-H, Property Manager		DOT-H, Property Manager	
Tomita	Jennifer	DOT-H, Property Manager		DOT-H, Property Manager	

Honolulu Harbor 2050 Master Plan
Planning Advisory Committee 2

Contact Last Name	Contact First Name	Sub-TAC Group	Email	Affiliation	Sign-in
~~Jason~~ Olney	Jason	U.S. Coast Guard		U.S.C.G. Sector Honolulu	[signature]
Blacklaw	Beau	US COAST GUARD		USCG SECTOR HONOLULU	[signature]

Exhibit A

1810 Historic Shoreline Map Overlay of the Aloha Tower Marketplace Area


Nuuanu St
Maunakea St
Smith St
Chaplain Ln
Bethel St
Fort Street Mall
S Hotel St
S King St
KAWAIAHAO
Jo Kalia
N Hotel St
River St
Merchant St
Wall
Attendants
Queen St
Kina'u
Haokuku
Keapuelani
HONUAKAHA
Nu'uanu Ave
Alakea St
Niking St
Kekauluohi St
Chiefs' houses
Keliimaikai
Nimitz Hwy
N Nimitz Hwy
S Nimitz Hwy
NIHOA
Shipyard
Fort St
Kalaimamahu
Kalanimoku
Halekauwila St
KAKAAKO
92
REEF
Kulolo'ia
(Beach)
Aloha Tower Dr
MAMALA
Punchbowl St
Kukahi St
Ho'okuleana LLC
... to take responsibility ...
© 2013 Google
Google earth

MEETING NOTES

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Date/Time:	Thursday, October 1, 2020; 1:30 p.m. to 4:30 p.m.
Location:	Virtual Meeting via Zoom
Purpose:	Planning Advisory Committee (PAC) Meeting #3
Host:	Department of Transportation, Harbors Division (DOT-H)
Attendees:	Please view **Appendix 7** of the Meeting Documentation

- Notes in [bracketed blue text] indicate supplemental information not explicitly discussed during the meeting.
- *Brown italicized text* indicates comments or questions by PAC participants.
- Brown regular text indicates a comment or response from the Project Team.

A. Welcome/Introductions Presentation Slides 2 – 5.

1. Opening Remarks (presented by Derek Chow, DOT-H Deputy Director)
   a. DOT-H and the Project Team are grateful to all the PAC members for their time and participation in the HHMP planning process. The COVID-19 pandemic has affected DOT-H's operations and has had economic impacts, since DOT-H's revenue is based on tariffs/fees/rents from users and tenants and does not receive money from the state's General Fund. However, DOT-H is working hard to ensure there are minimal impacts to the services and products provided to the maritime community.
   b. The HHMP supersedes the COVID-19 pandemic and will document the future needs of the harbor to serve maritime users/tenants, ensure a viable maritime industry, and support efficient/safe port operations.

B. Zoom Instructions (presented by Sam Dorios, Hawai'i Leadership Forum)

Presentation Slides 9 – 13.

1. Use Raise Hand and the Chat features to ask questions and provide comments. [Note: Questions and comments received through chat are documented in the discussion sections.]

C. Meeting Overview (presented by Linda Colburn, Where Talk Works [WTW])

Presentation Slides 6 – 8 and 14 – 18.

1. The purpose of the PAC Meeting #3 is to review the preferred draft HHMP alternatives and project prioritization. Input will be used to refine the Master Plan alternatives and project prioritization in preparation for the Technical Advisory Committee (TAC) Meeting #2 and Public Information Meeting (PIM) #1.
2. The PAC is an advisory committee, not a decision-making body. The purpose of the PAC is to provide guidance to the Project Team to refine the Master Plan alternatives and project prioritization.
3. The expected outcome for the PAC Meeting #3 is to identify pros/cons of each alternative.
4. The Project Team recognizes that the COVID-19 pandemic is impacting the maritime community in many ways, e.g., reduced inter-island cargo demand, disruptions to the cargo supply chain, fishing industry losses, suspended cruise operations, social-distancing requirements, and other operational impacts. We invite PAC comments on COVID-19 impacts that you think we should be aware of for the master plan. However, with a 30-year planning horizon, the analysis used for the Master Plan, particularly the cargo projections, already anticipates economic downturns. Therefore, the long-range planning analysis, assumptions and alternatives are not impacted by the COVID-19 pandemic. However, in the near-term, the pandemic will have a significant effect on harbor revenue generation, project budgets and project prioritization.

D. Planning Process (presented by Jim Niermann, R. M. Towill Corporation [RMTC]) Presentation Slide 19.

1. Since the PAC Meeting #2, the Project Team has refined the Master Plan alternatives for review/input at the PAC Meeting #3. The Project Team will also present the Master Plan alternatives at the TAC Meeting #2, which is tentatively scheduled around Thanksgiving [TAC Meeting #2 is tentatively scheduled for December]. Input received from both the PAC Meeting #3 and TAC Meeting #2 will be used to further refine the Master Plan alternatives and develop the draft Master Plan. The draft Master Plan will be presented at the PIM #1, which is tentatively scheduled for January [or February] 2021. After the PIM #1, the Project Team will develop the pre-final Master Plan for presentation at the PAC Meeting #4. At the PAC Meeting #4, the Project Team will request the PAC members' endorsement of the HHMP planning process in the form of a signature statement which will be included in the Final Master Plan. The Final Master Plan will be completed no later than April 2021. Once the Final Master Plan is completed, an optional TAC/PIM meeting may be held to present the Final Master Plan.

E. General Improvements (presented by Jim Niermann, RMTC) Presentation Slides 20 – 29.

1. Harbor Entrance Widening (Slide 21)
    a. DOT-H has requested the U.S. Army Corps of Engineers (USACE) to conduct a feasibility study to widen the harbor entrance channel based on USACE engineering and design standards for deep draft navigation projects, construction of a breakwater, and deepening the harbor operational depth. DOT-H and USACE have allotted funds for the next fiscal year to conduct the feasibility study.
    b. The Project Team conducted a High-Level Channel Widening Analysis, which indicates that all design vessels can navigate within the existing 500 FT channel entrance, except the SuezMax and Aframax vessels. Post-Panamax cruise vessels (e.g., Ovation Class) with a 135 FT beam require a channel width of 439 FT. However, the SuezMax and Aframax vessels require a channel width of 514 FT. The harbor entrance channel is 730 FT from the west side of the channel (along Sand Island) to the east side of the channel (pier face at Pier 1). For Post-Panamax vessels, there is approximately 290 FT (more than double the berth width) adjacent to Pier 1 for berthing outside of the defined channel, which suggests that it may be acceptable to berth a cruise ship at Pier 1. However, the Hawaii Pilots and cruise operators will need to be consulted about cruise operations at Pier 1, particularly with respect to transiting the channel while bunkering operations are taking place there.
2. Kapālama Channel Analysis (Slide 22)
    a. DOT-H has requested the USACE to conduct a feasibility study on widening the Kapālama Channel.
        i. In the short-term, DOT-H can address navigational issues through scheduling berth assignments and installing navigational aids.
        ii. In the long-term, sea level rise (SLR) may eliminate access beneath the piers for inspection and maintenance. A long-term recommendation may be to cut Piers 31 to 33 back to fast land and reconstruct the pier with bulkhead or sheet pile. This would widen the channel by 50 to 75 feet with benefits to navigation.
    b. The Project Team included the Kapālama Channel in the High-Level Channel Widening Analysis. The Kapālama Channel has a physical channel width of 600 FT from pier face to pier face, and a defined transit channel width of 400 FT. Cargo container vessels with 115-FT beam require 372 FT for one-way transit, resulting in 228 FT remaining for berthing on one side of the channel only. The analysis indicates that the operational depth should be maintained at 42.9 FT (41 FT existing).
3. Second Harbor Entrance (Slide 23)
    a. DOT-H has requested the USACE to conduct a feasibility study to reopen the second harbor entrance and replace the bridge with one of the following options:
        i. Moveable bridge to accommodate full-size cargo vessels in emergency events only;

ii. Fixed bridge with air draft to accommodate tug, barge and fishing vessels; or
iii. Hybrid – moveable bridge to accommodate full-size cargo vessels in emergency events only with air draft for tug, barge, and fishing vessels.

Alternatives that accommodate full-size cargo vessels require dredging/deepening of the Kalihi Channel to a depth of 45 feet out to open sea. The current depth is approximately 22 FT and the current authorized depth is 23 FT. The channel depth will have to be reauthorized by the USACE to a depth of 45 FT.

Discussion:

- *Kalihi Channel would need to have a greater depth to be functional, but the width does not need to change, including the channel that leads to the ocean. In terms of coral losses, most of the coral resources are lateral to the channel and are not in the channel.*

4. Raise Pier Heights (Slides 24 – 27)
   a. The Project Team will plan for 3.2 FT of SLR by 2060 and is considering the following recommendations:
      i. Raise existing gantry-supported cargo pier decks (e.g., 51A to 53B) to a consistent height of 10 FT above mean lower low water (MLLW), which is the approximate design standard for the Kapālama Container Terminal (KCT) [KCT pier deck height is 9.81 FT]. However, the final recommendation for pier height will be determined in consultation with cargo operators based on min/max vessel operational drafts and other operational considerations.
      ii. Raise other cargo piers (e.g., Piers 1 and 2, 19 and 20 and the Interisland Terminal) between 8 FT to 10 FT above MLLW.
      iii. Raise all other working piers to a height appropriate to the vessel type and operational needs.
      iv. Determine priority piers based on pier conditions and life cycles, programmed improvements, and public-private partnership opportunities.
      v. Implement adaptive design strategies for future flexibility in pier use. Do not design or construct features that will prevent future adaptive design.
      vi. Establish a statewide standard pier height. This is outside of the scope of the HHMP, but may be included as a recommendation to DOT-H.
   b. DOT-H consulted with port operators and engineers to determine the minimum and maximum pier deck heights based on vessel type. The preliminary input was presented at the PAC Meeting #2 and is included in the table below. The Project Team encourages the maritime operators on the PAC to review and comment on the preliminary vessel operational heights.

Type of Vessel / Operations	Minimum Height of Pier Deck Above MLLW	Maximum Height of Pier Deck Above MLLW
Barge (RO/RO)	6	10
Barge (Pass-Pass)	6	12
Bulk Carrier	6	15
Container	6	15
Cruise	5	10
Fishing/Workboats	3	8
Tanker	6	15
Tugs	3	9

[Note: Based on the operational heights in this table, a standardized pier deck height of 6 to 8 feet above MLLW would satisfy all vessel types.]

c. Alternatives to Raising Yard (Slide 27)
   i. The Project Team recognizes the extraordinary cost to raise the piers/yards as well as redesign all the associated infrastructure and surrounding facilities. The challenge can be reduced to two issues: (i) protecting the yard and landside facilities from inundation and (ii) ensuring that mooring heights meet the operational constraints of the various vessels.
   ii. The Project Team is considering the following alternatives to raising the piers/yards:
      a. Raise solid bull rail, curbing or apron along pier edge. A solid, continuous barrier would increase protection against inundation. The raised edge would need to be strong enough to moor a cargo vessel and handle lateral/vertical pull on the bollard system. The design must also accommodate cargo movement operations. However, raising the edge may conflict with RO/RO operations, which require a flat pier deck for the ramp support struts to rest flat. Another consideration is this alternative would require a drainage system for the yard to mitigate flooding that could occur during intense storms, hurricanes, tsunami, etc., by impoundment behind raised pier edges, and that will occur as the existing drainage outfalls become inundated due to SLR. [Note: Many of the more than 100 existing drainage outfalls into Honolulu Harbor have inverts that are currently near or below MLLW. As SLR

increases, many outfalls will become submerged, causing drainage water to backup and contribute to flooding in the terminal yards.] The drainage system could include the use of pumps. The Project Team is currently researching design precedence but has not found a location where raising a solid bull rail, curbing or apron has been implemented.

b. Modified mooring dolphin system incorporated into the pier face to ensure that the mooring height is within the operational range of the vessel as SLR reduces the freeboard to the pier deck. This type of system is used in ports with extreme tidal ranges; however, this design is difficult for cargo vessel operations.

iii. The Project Team is considering recommending that DOT-H establish a working group with academics, industry representatives, port planners, and government agencies to identify design solutions to address SLR impact on pier and yard facilities, and to research examples from other regions for applicability to Hawaii.

Discussion:

- *Standardizing pier heights would be a good idea from the standpoint of minimizing the amount of de-ballasting that ships would need to do when they enter the harbor to adjust to the pier heights. This would reduce the potential for spreading invasive aquatic species. There are existing water exchange regulations in place, but they are not perfect. It would be better if there is less water exchange that takes place in the harbor.* [Note: Most cargo vessels coming to Hawaii are laden inbound with imported cargo. These inbound vessels are not in a ballast condition, and the ballasting is limited to taking on water ballast at Honolulu Harbor as cargo is offloaded to ensure the vessels' safe stability and outbound voyage in-ballast.]
- *Raising only the pier edges rather than the full piers could create an enormous vulnerability to storm surges during major hurricanes. A major storm surge would overwhelm the pump systems and cause the entire pier and yard to be underwater. This would probably amplify losses during a storm.*
- *For the Kapālama Canal, the City and County of Honolulu (CCH) is planning for 3.2 FT SLR in the near-term and 6.6 FT in the long-term. CCH is trying to figure out a seawall design that would be a lower height to minimize impacts to the road. CCH's concern is if the seawall is elevated too much initially or if the seawall is widened at the higher height, then it will not relate well to everything at lower grades. On a larger scale, if everything is designed for 6 FT SLR now, there is the issue of grade transition between adjacent properties.*
- *[via chat] Support for comments related to the impacts to the surrounding roads and highways resulting from raising the piers to address the sea level rise. This concern came up in prior meetings. It*

is a critical point to emphasize each time we discuss raising the piers. There is already concern about existing ponding that occurs in terminal yards in their current design and may present more challenges for terminal operators if not properly addressed in planning for SLR.

- *Have the pandemic impacts been considered when looking at the cargo throughput forecast?*
  - Note: The cargo throughput forecast model includes economic downturns in the projections, such as those resulting from the pandemic, therefore the 2050 projections are valid and will be used as-is for HHMP planning.
- *[via chat] Regarding the Slide 27 or 28 discussion of whether to raise whole pier or just the edges. Consider talking with Mike Meyer and Mike Flood for precedent examples. Both Mike Meyer and Mike Flood may be working for WSP and under contract with Highways to do their climate adaptation study. They were CCH's engineering subs for the USDOT Gulf Coast Phase 2 study; they looked at how to decide what critical infrastructure is most important and how to harden/raise/adapt and connect.*
- *The U. S. Coast Guard (USCG) is working on two important transportation projects. (1) In Kalihi Channel, the USCG is installing two new range towers to aid navigation. The USCG has invested approximately $3 million for the two towers. The project is scheduled for completion by next month. (2) Since the last PAC Meeting #2, Congress has appropriated money for homeporting a second buoy tender in Hawai'i. Hawai'i used to have two buoy tenders, but currently there is only one. The second buoy tender is tentatively scheduled to arrive in Hawai'i around 2024. Before the second buoy arrives, USCG will upgrade the second buoy's homeport location at Pier Foxtrot at the USCG base, directly adjacent to Pier 53. Upgrades will include improving the pier's hard face and shore tie installations. Construction will probably start two years from now. The SLR information is helpful to ensure that the upgrades are designed correctly.*
  - Jim Niermann elaborated on SLR implications and adaption measures relating to ships, barges and dock equipment. Slide 24 shows the current inventory of piers and pier heights, except for KCT. The Project Team is anticipating a 3.2 FT SLR by 2060; however, the HHMP planning horizon is to 2050. The Project Team is considering the SLR challenge from two perspectives: (1) Operational requirements for vessels to operate across the berth as the available pier deck freeboard is reduced through SLR; and (2) Susceptibility of yards/backlands to inundation/drainage from SLR. Raising the yard might create more freeboard to adjust the drainage outfalls, but it will come

with many complexities and may be impractical from a cost standpoint. The Project Team is trying to address the issue related to vessel operation heights by determining the minimum and maximum pier deck heights (see Slide 26). After vessel operation heights have been determined, the Project Team will have better information to make specific recommendations for SLR adaptation at the various piers. For example, Sand Island piers may need to be elevated because with 3.2 FT SLR, the pier will be less than the minimum pier deck freeboard required for container ships (5 FT). The Project Team will likely recommend either raising the berth and/or yard. In the previous PAC meetings, the Project Team and PAC members identified the challenge of integrating raised berths/yards with critical streets or travel ways (e.g., Sand Island Access Road, Nimitz Highway, and Waiakamilo Road). Addressing the magnitude of SLR's impacts to the harbor and highways will require cross-agency coordination.

  - The Project Team is recommending that pre-staged emergency equipment and other critical equipment are stored in hardened vertical structures (see Slide 28). Pre-staged equipment could also be stored in multiple key locations, e.g. Piers 1 and 2, 19 and 20, 29, 31 to 33, Interisland Terminal and KCT. The maritime community informed the Project Team that critical equipment could be moved around with barges instead of stored at multiple key locations; however, the Project Team will still recommend at least one and preferably two or three dedicated area for pre-staging emergency equipment within the harbor. [Note: Soley relying on off-site storage wouldn't be prudent as roads may be impassable after a disaster which would delay transporting emergency equipment to the harbor.]
  - Derek Chow emphasized that DOT-H will take a holistic approach and consider strategies to adapt infrastructure, as well as operations and access to work areas. This will require a lot of coordination and discussion with each operator to ensure that adaptation strategies are specific to the requirements of the operator and pier. The Master Plan will provide broad guidelines, but implementation of adaptation strategies will be more specific based on the needs and operations of users.

- *The SLR issue will continue to evolve and hopefully there will be more group sessions to participate in. Another issue to consider is that raising the piers will affect the height of the gantry cranes, which Pasha and Matson had to work with the Federal Aviation Administration (FAA) to get their height requirement restrictions addressed for the flight area. Height requirement restrictions will still be an issue with SLR.*

5. Resiliency Piers (Slide 28)
    a. The Project Team is identifying piers to be designated as emergency staging piers and is considering, as a first priority, focusing resiliency improvements at non-dedicated piers that do not have regularly scheduled operations, i.e., Piers 1 and 2, 19 and 20, 29 and 31 to 33. Of these, the Project Team favors Piers 1 and 2 and Pier 29 as priority for resiliency improvements:
        i. The findings of Martin & Chock, Inc.'s 2017 *Honolulu Port Analyses for the Hawai'i Tsunami Scenarios* study, indicate that Piers 1 and 2 would suffer less damage from tsunamis than other piers in the harbor interior. On this basis, Piers 1 and 2 make sense as priority piers for resiliency improvements. In addition, Piers 1 and 2 are best suited to serve as resiliency / emergency response piers due to their location at the harbor entrance where there is lower potential for incoming supply vessels to encounter debris and damage compared to piers in the harbor interior.
        ii. Pier 29 is also a candidate for resiliency improvements because it already has an improved yard and needs only the pier face, apron and notch to be improved and strengthened to serve as a resiliency pier. Compared to other piers, such as Pier 19, the scope and cost of improving Pier 29 is significantly less.
        iii. Other factors will weigh in the decision on prioritizing resiliency improvements, including cost and affordability, potential for revenue generation to pay for the improvements, opportunities to piggy-back on other necessary pier improvement projects, and opportunities for public private partnerships.
    b. Pier improvements may include strengthening piers and decks, installing sheet-pile/bulkhead, installing heavy-lift pads, and hardening power/communication conduit.
    c. The resiliency piers will have designated locations to pre-stage emergency equipment and supplies (e.g., fuel, generators, heavy equipment, materials) in existing or planned multi-use, reinforced structures. The reinforced structures could serve as command posts following a natural disaster. One idea is the proposed Maritime Center at Piers 19 and 20, which could also accommodate pre-staged emergency equipment.
        i. The Triple F building is also being considered as an emergency equipment pre-staging site.
    d. The DOT-H O'ahu District has an informal agreement with Pu'uhale Elementary School to relocate motor vehicles and equipment from the DOT-H base yard to the elementary school grounds in the event of a tsunami or hurricane event.

Discussion:

- *The cruise building would be an ideal location for emergency operations. The Project Team should also consider potential future pandemics and whether the cruise building may need to be larger to accommodate keeping people further apart with larger pedestrian areas.*

6. Layberth (Slide 29)
   a. The Project Team conducted a layberth analysis, which indicates a total of approximately 2,000 linear feet (LF) of additional layberth will be required by 2050 to maintain the target utilization rates.
      i. The Tyco pier will provide the majority of the layberth needed and is currently being acquired by DOT-H. Additional mooring dolphins would extend the existing 600 LF to 1,200 LF of layberth space.
      ii. Pier 38 provides the opportunity for developing an additional 960 LF of layberth space for shallow-draft vessels. The new berthing could be used by fishing vessels for off-loading and provisioning. This layberth space would have restrictions for vessel size and duration of berthing. [Note: A floating dock design for fishing vessel and workboat is still being considered.]
      iii. Piers 7 and 22/23 could each provide an additional 900 LF of layberth space.
         a. Pier 7 could be used for excursion vessels.
         b. Piers 22 and 23 would be suitable for tugs and water taxis.
      iv. Pier 60 could provide as much as 900 LF of layberth in the long-term. It would require substantial dredging. The presence of recreational vessels moored in the channel at the Sand Island Small Boat Harbor also pose a navigational concern.
   b. Moorings could be installed on the makai side of Slipper Island as it is located within DOT-H's jurisdiction. However, it is exposed to southerly swells and would require significant dredging. Additionally, work in the inundated areas of Keehi Lagoon and in proximity to the airport and sea plane runways, have substantial regulatory requirements and high development costs. For these reasons, Slipper Island does not seem to be an ideal location to accommodate additional layberth/mooring space.
   c. A potential fourth offshore anchorage is being considered.

Potential New Layberth (LF)	
Projected Layberth Need	1,921
Potential New Layberth	

Tyco Pier	1,200
Pier 38	960
Total	**2,160**

Discussion:

- *If the Slipper Island layberth is pursued, there would be a fair amount of unavoidable coral loss, which would trigger associated compensatory mitigation requirements. This would be expensive and complicated. Pier 60 to the small boat harbor may also have issues with unavoidable coral loss.*

F. 2050 Throughput and Capacity Needs (presented by Jim Niermann, RMTC)
Presentation Slides 30 – 34.

1. Existing Capacity vs. 2050 Throughput (Slide 31) and Projected Container Throughput and Capacity (Slide 32)
   a. By 2050, KCT will be operational and add approximately 430,000 Twenty-Foot Equivalent Units (TEU) of container capacity to Honolulu Harbor. Honolulu Harbor's capacity with KCT and 2050 Annual Throughput Projection is presented in the table below:

Sector	Unit	Existing Capacity	Annual Throughput Projection 2050	Difference
Containers	TEUs	1,860,000 (w/ KCT)	2,046,000	**-186,000**
RO/RO (Automobiles)	Units	367,000	225,000	+142,000
Liquid Bulk*	Bbls	20,630,000 (w/ KCT)	10,080,000	+10,550,000
Break-Bulk/Neo-Bulk	Tons	763,000	368,000	+395,000

Sector	Unit	Existing Capacity	Annual Throughput Projection 2050	Difference
Dry-Bulk (Aggregate)*	Tons	500,000	< 10,000	+500,000

b. The projections indicate that by 2050, with the addition of KCT, Honolulu Harbor will have adequate capacity for all cargo categories except containers. Assuming the cargo terminals will continue to operate as they do currently, with no changes to yard density, dwell times, or cargo handling, the projections indicate a container capacity shortfall of 186,000 TEUs (1,860,000 TEU capacity accommodating 2,046,000 TEU throughput), which is approximately 9 percent of projected 2050 throughput.
c. The Projected Container Throughput and Capacity graph on Slide 32 shows a baseline (blue line), high (green line), and low (yellow line) projection for future container throughput. Following the baseline projection, Honolulu Harbor will have adequate capacity to handle container throughput until early 2040 with no changes to terminal operations. By early 2040, harbor capacity for container operations will have to increase to make up the approximately 9 percent shortfall. This can be accomplished in several ways such as:
    i. Increasing the yard operational efficiency and density by grounding and stacking containers;
    ii. Reducing dwell times;
    iii. Incorporating the use of additional Ship-to-Shore (STS, also known as gantry) cranes; or
    iv. Increasing productivity by increasing moves per hour.

2. Throughput and Sustainable Capacity Summary (Slides 33 – 34)
    a. The legend color scheme for the summary slides is as follows:
        i. Orange (berth/marine operations)
        ii. Yellow (container storage, grounded/wheeled)
        iii. Light purple (general storage and autos)
        iv. Purple (truck gates/queuing)
        v. Blue (auxiliary facilities/buildings/labor-staff parking/chassis)
        vi. Green (fishing operations)
        vii. Dark Red (maritime support)
    b. Based on relatively minor operational changes and yard densification, the 2050 sustainable capacity for the three main cargo terminals is shown in the table below. These three terminals alone can accommodate the projected 2050 throughput of 2,046,000 TEU.

Honolulu Harbor 2050 Throughput and Sustainable Capacity (TEU)	
2050 Projected Throughput	**2,046,000**
2050 Sustainable Capacity	
Sand Island	1,300,000
KCT	650,000
Interisland Terminal	250,000
Total 2050 Sustainable Capacity	**2,200,000**

c. Additional container cargo capacity is available at Piers 1 and 2, 19 and 20, 29, and 31 to 33.
   i. Piers 1, 2 and 29 capacity were based on existing operations that were projected to 2050.
d. Projected 2050 throughput for autos is 225,000 units, which would require 16.3 acres (AC) of area. There is ample space to handle this throughput within Honolulu Harbor at Piers 1 and 2, 19 and 20, 29 and 31 to 33.
   i. Matson intends to bring their entire auto operation onto Sand Island.

Discussion:

There were no further comments and/or questions from the PAC participants.

G. Sand Island Terminal (presented by Jim Niermann, RMTC) Presentation Slides 35 – 36.

1. Sand Island has plenty of yard space but is a berth-constrained terminal.
2. Recommendations:
   a. Balance berth and yard – improve the efficiency of cargo movements over the berth and/or increase cargo volume across the berth by mid-2040 to accommodate 1.3 million TEUs. Options include:
      i. Increase the number of gantry cranes to between 7 and 9.
      ii. Improve efficiency and increase the number of moves per hour by RO-RO / barge operations.
      iii. Adding gantry cranes or other methods to improve the efficiency of cargo movement will be determined by the terminal operator.

b. Densify the yard by increasing the percentage of grounded containers. [Note: As shown on slide 36, between 25 and 30 percent of the terminal is still allocated for auxiliary space (parking, miscellaneous buildings, maintenance, and/or storage). The industry standard for auxiliary space is typically 10 to 15 percent of the total terminal area, so some of this space could be allocated to container storage to reduce the overall proportion of grounded containers.]
   i. For container with auto operations (approximately 12 acres), increase grounded/stacked containers from 17 percent to 42 percent, with a corresponding reduction in wheeled operations from 83 percent to 58 percent.
   ii. For container-only operations, increase grounded containers from 17 to 31 percent, with a corresponding reduction in wheeled operations from 83 to 69 percent.

c. Allocate 12.5 AC for autos (85,000 units per annum) and project cargo. The site plan shows the acreage at Pier 51A, but it can go anywhere in the yard based on the operator's requirements. The amount and location of area will be determined by the terminal operator.

d. Improve truck gates and internalize truck storage to eliminate queuing on Sand Island Parkway.

e. Relocate buildings that are near the end of their service life to the perimeter of the yard and relocate office buildings to an off-site location to maximize yard area and improve operational efficiency.

f. Consider repurposing the existing Sand Island weigh station to serve as a joint-agency shared inspection station. The weigh station will become obsolete with the imminent installation of weigh-in-motion technology at each cargo terminals.

3. Matson has informally shared preliminary proposed terminal improvements with DOT-H. The improvements are consistent with the suggested general recommendations presented. DOT-H is currently reviewing the recommended improvements as part of ongoing discussions with Matson.

Discussion:

There were no further comments and/or questions from the PAC participants.

H. Kapālama Container Terminal (KCT), Piers 41-43 & Interisland Terminal, Piers 39-40 (presented by Jim Niermann, RMTC) Presentation Slides 37 – 39.

1. To meet the 650,000 TEUs throughput needs by 2050, KCT requires a wheeled-to-ground ratio of 22 to 78 percent. If Pasha brings all their auto storage to KCT (approximately 9 acres), then KCT will have to operate a 100 percent grounded operation to balance berth and yard.
   a. The Master Plan is presenting the KCT Harbor Modernization improvements as-is and is not recommending further improvements to KCT.

2. The Interisland Terminal is currently 100 percent grounded operations. Sustainable capacity for Interisland throughput will be anywhere from 225,000 to 250,000 TEUs by 2050.
3. Interisland Terminal Recommendations:
   a. Relocate all buildings to the perimeter of the yard or to an off-site location to improve operational efficiency.
   b. Infill slipway at Pier 39 and 40 to create approximately 0.5 acres of additional yard space yet retain berthing for four (4) barges.
   c. Reconstruct, raise, strengthen, and improve all piers and yards to accommodate container storage and handling to the pier's full extent. Consider sheet pile/bulkhead construction. Improve fendering and bollards.
   d. Reconstruct, raise and strengthen pier and revetment at Kapālama Canal outlet for resiliency and terminal function.
   e. Internalize truck queuing to eliminate traffic impacts on adjacent public streets.
   f. Create a new Libby St. entrance for staff and customers outside of the secured area.
   g. Provide internal truck queuing adjacent to Auiki St.
   h. Consider one-way in and one-way out vehicle circulation.
   i. Consider relocating livestock and/or less than container load (LCL) operations to an off-site location, such as the Triple F Building near KCT or another nearby site.
      i. LCL relocation may occur under a scenario where LCL is removed from the Public Utilities Commission (PUC) requirements for the Interisland Terminal operator. LCL would instead be handled by third-party consolidators. This would free up terminal yard space to improve the yard's efficiency.
      ii. Removing LCL will require parallel changes on the neighbor islands and would add cost due to handling the movement of cargo more than once.

Discussion:

- *Backfilling the stern area of Piers 39 and 40 will increase the yard area and may help Young Brothers' (YB) operations, but the Project Team should consider how it will impact staging the yard and traffic flow. YB currently needs improvements to their yard and traffic flow. Additionally, Pier 39E and 39F have significant damage that affect YB's operational use.*
- *[via chat] Backfilling the Piers 39 and 40 slipway would affect YB's ability to berth two barges on each side safely, which would mean that YB could only berth one barge per pier 39 d/e and 40 a/b.*
  - The Project Team will reevaluate the slipway at Piers 39 and 40 and Interisland Terminal in consultation with YB.
- *[via chat] When you say "backfill" is that between Piers 39 and 40? If so, where will those barges go for cargo ops?*

- The Project Team is considering the recommendation to infill a small portion of the slipway at Piers 39 and 40, while maintaining sufficient berthing for 4 barges (approximately 850 FT at Pier 40A/40B and 872 FT at Pier 39D/39E). See slide 38, which indicates the proposed area for infilling the slipway in a yellow rectangle with red dashed outline and the 4 barges in black rectangles. Infilling the slipway would use bulkhead construction to create more yard space. The Project Team will follow up with YB regarding the feasibility of infilling the slipway at Piers 39 and 40.

I. Piers 12 to 38 (presented by Jim Niermann, RMTC) Presentation Slides 40 – 59.

1. Piers 15 to 38 Overview (Slide 41)
   a. Piers 15 to 38 contain most of the maritime support operations in the harbor. This area also includes the general cargo piers at Piers 19, 20, 29, and 31 to 34 and the fishing fleets at Piers 16 to 18 and Piers 36 to 38. The privately-owned (IES) fuel facility separates the area at Pier 30.
   b. General recommendations for this area include:
      i. Improve cargo piers for mixed-use cargo operations.
      ii. Create opportunities for maritime tenants through long-term lease agreements, public-private partnerships (PPP), and capital advancement program funding.
      iii. Develop dedicated tugboat pier - “Tug Row” at Piers 21 and 22.
      iv. Develop a new maritime center at Piers 22 and 23.
2. Piers 36 to 38 – Fishing Village (Slides 42 – 43)
   a. Extend pier improvements at Pier 38 for fishing vessel off-load and provisioning and for layberth. This will add approximately 630 LF of new berth for shallow-draft vessels.
   b. Develop a new pier adjacent to the maritime support area for workboats and layberth. This will add approximately 330 LF of new berth for shallow-draft vessels.
   c. Consider reconstructing the existing fuel barge pier. The fuel barge is nearing the end of its useful life and may be replaced or moved to another layberth location. It is not dependent on the current pier location.
   d. Consider floating dock design for fishing vessels (and workboat piers). Floating docks are less expensive to construct and may be more resilient to tidal fluctuations and outfall from Kapālama Canal. There will need to be restrictions for no rafting and double berthing so cargo operations can continue at Pier 39.
   e. Extend Pier 36 to the federal project limit. This will add approximately 320 LF of new berthing for fishing vessels and workboats. This recommendation is not a high priority.
   f. Recommended Access Improvements

i. Maintain access through the fishing village with connections at the existing full-movement signalized intersections at the Pier 38 Driveway and Alakawa St. on Nimitz Hwy.
ii. Create a new access driveway to Piers 31 to 34 with a connection to the signalized intersection at Alakawa St. and Nimitz Hwy.
iii. No changes are proposed to the two existing access driveways to Piers 31 to 34. These driveways will continue to be east-bound right-in and right-out only.
iv. Channelize the Alakawa St. intersection queuing lanes using striping or "candlesticks" to separate the Fishing Village traffic from the cargo pier / maritime traffic.

3. Piers 19 to 33 (Slides 44 – 49, and 52)
   a. Cargo Piers (Piers 19 and 20, 29, and 31 to 34)
      i. Clear buildings and structures to create open, general purpose, mixed-use cargo terminals. Provide improvements, such as lighting, and strengthening to handle heavy maritime cargo handling equipment.
      ii. At Pier 29, improve the pier face and apron to an approximately 50-FT width. Fill the existing notch in the apron.
      iii. Recommended Access Improvements
         a. Currently underway: reauthorize and reconstruct the east-bound highway exit lane connecting to the Pacific St. intersection and access to Piers 27 to 29. At the Pacific St. exit, container trucks leaving Pier 29 will be restricted to right-out only to avoid blocking the Pacific St. intersection.
            i. The Master Plan will reference the in-progress reauthorization of Pacific St.
   b. Maritime Center at Piers 22 and 23 (Slide 45)
      i. Develop a multi-level, mixed-use structure to accommodate office, ship agents, parking, auto storage, and high-cube cargo operations at ground level. Incorporate existing McCabe building.
      ii. Include commercial/retail on Nimitz Hwy. frontage.
      iii. Provide storage area for large/heavy maritime cargo handling equipment and emergency equipment.
      iv. Integrate parking and auto storage with Piers 19 and 20 cargo operations.
      v. Examples of the type of structure being contemplated for the Maritime Center include Walmart on Keʻeaumoku St. and the Airport Industrial Center (Slide 47).
      vi. Recommended Access Improvements
         a. Reauthorize the driveway entrance at Pier 23 to provide right-turn-in only access to Pier 21, "Tug Row," and maritime uses and the proposed Maritime Center at Piers 22 to 23.
         b. Develop the existing Kukahi St. driveway entrance as the primary access to the new Maritime Center and Piers 19 and 20 cargo

terminals. Signalize the intersection. Coordinate with DOT-HWY for a signalization warrant study.

c. Maintain the existing driveway access to the Piers 19 and 20 cargo terminal, Pier 19 warehouse and Hawai'i Pilots at Pier 18. Maintain existing driveway access to Piers 16 to 18 Fishing Fleet.
d. Traffic Assessment Report Recommendations:
    i. Redirect Piers 16 to 20 traffic to Kukahi St. This option is not being considered in the Master Plan due to the security requirements at Piers 16 to 18.
    ii. Construct a channelizing island on the makai-Ewa corner of Nimitz Highway and Kukahi St. intersection to improve pedestrian safety.

c. Pier 19 DOT-H Ops Base yard (modification of the Maritime Center Option) (Slide 48)
    i. Consolidate DOT-H Sand Island Base yard and custodial operations at Pier 19. The base yard would occupy approximately 3.4 AC of area, including most of the Pier 19 shed, Super Ferry Terminal, and the open space areas fronting Nimitz Highway.
    ii. Renovate Pier 19 shed and Super Ferry Terminal for maintenance and repair shop, storage, and office space.
    iii. Repave the yard for parking, fleet vehicles, and equipment storage.
    iv. The makai edge of the Pier 19 shed, all of Pier 20 and the full apron would continue to be used for cargo and auto operations.
    v. Pier 20 open cargo yard would be integrated with the Maritime Center building parking structure with high-cube ground-level and upper levels for auto storage.
d. Tug Row at Piers 21 and 22 (Slides 49 and 52)
    i. Demolish existing buildings and consolidate tug operators in a new shared office, warehouse, parking, and maintenance facilities.
    ii. Reconstruct and strengthen pier, apron, and yard.
    iii. Consider sheet pile/bulkhead construction.
    iv. Provide shoreside power.
    v. Reauthorize Pier 23 driveway entrance on Nimitz Hwy. to provide primary access. Exit will be via the Kukahi Street intersection.
    vi. Phase improvements so as not to disrupt tug operations.
e. Consolidate Maritime operators in shared facilities where possible.
f. Recommend long-term leases to facilitate tenant investment in harbor facilities. Consider PPP as an alternative method of funding harbor improvements.
g. Relocate the Honolulu Marine drydock from Pier 27 to 26 with a storage area at the end of Piers 25 and 26.

Discussion:

- *The proposed DOT-H Ops base yard should not be located near Piers 19 and 20 since cargo operators handle vehicles in the shed*

area. Space will become limited depending on the cargo being offloaded.

- *Piers 19 and 20 are ideal for car carriers, which typically berth their vessel with the bow of the ship at the makai end of Pier 20 and the stern of the ship at Pier 19. The vessel's ramps go down where the DOT-H Ops base yard is proposed. Drivers unloading autos and heavy equipment from the ship must make a U-turn near the pilot's office to go towards the makai side of the pier.*
- *While DOT-H Ops needs a location for their base yard and offices, there is no need for it to be located on the waterfront. The area should be reserved for uses that need to be on the waterfront. DOT-H may think that Pier 19 is an ideal location for the DOT-H Ops base yard and other non-cargo ideas, but it will not serve the cargo operators whose operations need to be on the waterfront.*
- *In the future, cargo operators will need more space at Pier 19, so removing the building/shed is a good idea.*
- *Will the Maritime Center at Piers 19 to 23 be defined within the parameters of security protocols for maritime facilities? Or is the idea for a Maritime Center based on who will invest and highest/best use the land?*
  - The Maritime Center would likely involve partnering with a private investor to fund the development of the multi-story structure. The Project Team understands the security constraints/protocols and the need to separate the secure cargo operations and non-secure areas. The Maritime Center is currently in the early, high-level concept phase, but the general concept is to develop a multi-story building that serves primarily maritime uses, but also non-maritime uses. The portion of the building adjacent to the cargo yard would be designated as a secure area for maritime uses including a high-cube ground level and upper levels for auto storage. The portion of the building adjacent to Nimitz Highway could be designated as a non-secure area for non-maritime uses including offices, retail, public parking, etc. Secure auto storage and non-secure public parking areas will be separated.
- *The Project Team should continue to explore ideas for utilizing the space as a DOT-H Ops base yard and Maritime Center, but ultimately a public investor will likely dictate the overall usage and/or square footage of the development, and the maritime uses might be shut out due to the economics. However, maritime space is limited in the harbor and this issue will only be exacerbated with SLR. As SLR starts to impact all the users, they will need space to redirect/reposition their existing activities, but there is limited maritime space identified in the Master Plan.*
  - The Project Team will consider this issue as they continue to work on the concept for the Maritime Center and Master Plan.

4. Piers 22 and 23 (Slides 50 – 51)
    a. Reconstruct the pier due to its dilapidated condition and strengthen the pier foundation to support construction of the proposed Maritime Center.
        i. Consider sheet pile/bulkhead construction.
    b. Clear out subsurface coral and rocks and cut back pier face by 20 to 40 FT to widen slipway.
    c. Dredge the full extent of the slipway to 35 FT depth.
    d. Demolish silos, warehouses, and miscellaneous buildings to accommodate driveway access and efficient yard area layout for maritime uses.
        i. Existing silos and related structures constrain the efficient use of Piers 22 and 23. Existing space between the pier face and silo buildings is limited. With the silos, the reconstructed pier would further reduce the functional maritime use area. Removing the silos and related structures adds 110 FT of additional width adjacent to the pier face and improve yard efficiency.
    e. Reauthorize driveway access on Nimitz Hwy. to provide primary access to Piers 21 to 23 and the proposed Maritime Center.
    f. Improve Pier 23 for use by maritime tenants and as layberth.
5. Piers 16 to 18 – Fishing Fleet (Slide 53)
    a. Develop a new respite center and office/storage building at Piers 16 to 18. This project is in the process of development.
    b. Widen Pier 16 to accommodate motor vehicles for provisioning and fueling. This is a low priority project as there are existing workarounds. Recommend programming this improvement when the current pier reaches the end of its designed life cycle.
    c. Pier 18 – Replacing the current pier with a proper concrete pier may be a part of the DOT-H Capital Improvement Program (CIP) instead of the Master Plan.

    Discussion:

    - *[via chat] Widening fishing fleet pier would be good for HFD (Honolulu Fire Department) to respond, too.*

6. Piers 12 to 15 (Slide 54)
    a. Recommend long-term leases and public private partnership agreements to incentivize investment in maritime facilities, including pier reconstruction and development of support buildings.
    b. Piers 12 to 15 will continue to be used for maritime support operations.
        i. Pier 15 – Used by the Harbor Police over the entire planning horizon.
        ii. Piers 13 and 14 – Maritime Tenant
            a. Remove warehouse building to create an open yard or redevelop into a multi-story building with high-cube ground level and upper-level space for office and storage.
        iii. Pier 12 – Layberth or Maritime Tenant

a. Replace segmented pier with a proper pier.

7. Maritime Use – Aloha Tower Area (Slide 55)
   a. Piers 10 and 11 waterside will be used for layberth and maritime uses.
   b. Piers 10 and 11 building can be used as a cruise terminal, retail and commercial facility, or a combination of the two.
   c. Piers 5 to 9 are recommended for day excursions, ferry, layberth and maritime use along the waterside.
   d. Pier 8 recommendation is to upgrade the pier with water, sewer pump-out, and lighting utilities to support day excursions.

Discussion:

- *Roy Catalani is the new Cruise Lines International Association (CLIA) governmental affairs consultant and is replacing Charlie Toguchi. CLIA would like to request a meeting with DOT-H and the Project Team to discuss the alternatives for cruise operations and service details/operations for Piers 1 and 2, and 10 and 11. CLIA would like more information regarding the feasibility of eliminating Piers 10 and 11 in favor of Piers 1 and 2. Without additional information/discussion, CLIA is unsure whether it can endorse the Master Plan.*
  - The Project Team will set up a meeting with CLIA to further discuss the alternatives for cruise operations.
- *[via chat] Agree with Roy that Piers 10 and 11 need to be kept as a dedicated cruise ships secondary berth.*
- *Using Pier 1 as an alternative berth for cruise ships instead of maintaining Piers 10 and 11 as the secondary berth would create more problems than it solves. One issue is most cruise ships bunker in Honolulu Harbor. If a cruise ship is bunkering while berthed at Pier 1, it will restrict/confine other ships transiting the channel, as well as pose a safety issue (e.g., fire and oil spills). Piers 1 and 2, and 10 and 11 are being used by large Aframax and Suezmax ships that come from a single point mooring and must bunker within the harbor. Due to their size, beam, and length, the Aframax and Suezmax vessels can only berth at one of those piers within Honolulu Harbor. During peak cruise season, Honolulu Harbor may have two big cruise ships and another cargo tanker ship that want to berth, but will have to wait to enter due to their size. Honolulu Harbor will need all those berths for large ships.*
  - [Note: Moving cruise vessel operations to Piers 1 and 2 does not necessarily take away a berth for the Aframax and Suezmax vessels; three berths would still be available. Cruise ship calls to Piers 1 and 2 are expected to be, conservatively, 30 to 50 berth days per year. Also, if the Aframax and Suezmax vessels need to bunker at Pier 1, it presents the same navigational problem as it would for cruise vessels, presumably with the same work-around.]

- *[Two comments via chat] Agree with Captain Enos' comments regarding Piers 10 and 11.*

8. Pier 2 Cruise Terminal and Pedestrian Connectivity (Slides 56 – 59)
   a. Pier 2 Cruise Terminal recommendation without the acquisition of the General Services Administration (GSA) lot: (Slide 56)
      i. Utilize approximately 1 to 2 acres of land area at the mauka end of the Pier 2 yard to increase the staging area for passenger ground transportation and ship provisioning/servicing vehicles.
      ii. Reconfigure queuing and staging to improve circulation.
   b. Pier 2 Cruise Terminal recommendations with the acquisition of the GSA lot: (Slide 57)
      i. Acquire federal GSA lot and use the area to improve vehicle queuing, parking, and motor vehicle circulation.
      ii. Utilize approximately 0.5 to 1 acres of land area from the Pier 2 yard to increase the staging area at the makai side of the existing cruise terminal building to expand and improve circulation for containers and service trucks that service cruise vessels.
      iii. Renovate the historic Department of Health (DOH) building for maritime office uses.
   c. Utility Upgrades (Slide 58)
      i. Provide shoreside sewer connection for cruise vessel discharge to municipal collection systems.
      ii. Improve shoreside water connection for cruise vessels to take on water (pressure and flow). Consider upsizing existing lines and providing pumps.
      iii. Provide shoreside power to reduce carbon emissions from idling vessels.
   d. Cruise Terminal Pedestrian Connectivity (Slide 59)
      i. Improve pedestrian connection between Aloha Tower Marketplace, Downtown and Chinatown and the Pier 2 Cruise Terminal.
      ii. Widen the Channel Street sidewalk.
      iii. Work with the Hawai'i Community Development Authority (HCDA) and Kamehameha Schools to improve pedestrian connections to Kaka'ako.

   Discussion:

   - *The Project Team should consider swapping the "ballfield" parking lot located adjacent to Channel Street with the GSA lot (also called Fort Armstrong). The GSA lot is used by federal agencies (e.g., USCG) who will not want to lose their parking. A parking lot swap would improve traffic patterns and relocate federal parking closer to the federal building.*
   - *[via chat] Thank you, confirmed Mr. Polhemus. The CG (Coast Guard) does use that lot, among many other federal partners.*

- *How is rail integrated into the Master Plan, in the areas between Piers 2 and 11?*
  - The Project Team will discuss this further in the non-maritime section presented by Laura Mau, RMTC (Refer to Section L, Non-Maritime Alternatives Aloha Tower Area).

J. Piers 1 & 2 (presented by Jim Niermann, RMTC) Presentation Slides 60 – 68.

1. Piers 1 and 2 – Cargo and Resiliency Pier (Slide 61)
   a. Reconstruct and raise pier and yard 8 to 10 FT above MLLW to serve as primary resiliency pier and multi-use cargo pier.
   b. Consider sheet pile/bulkhead construction. Include wave energy diffusion/absorption with pier design.
   c. Construct heavy-lift pads and reinforced utility conduit for function as resiliency pier.
   d. If mutually beneficial agreements can be reached, acquire the 5-acre Office of Hawaiian Affairs (OHA) parcel and 0.8-acre HCDA remnant to expand the yard and improve operational function.
2. Cruise Terminal Alternatives (Slide 62)
   a. Pier 2 with Piers 10 and 11 as an exclusive cruise terminal (2 berths).
   b. Pier 2 with Piers 10 and 11 as shared-use cruise terminal with commercial/retail (2 berths).
   c. Piers 1 and 2 consolidated cruise terminal, eliminate Piers 10 and 11 (2 berths).
   d. Pier 2 cruise terminal (single berth).
   e. Piers 19 and 20 – Continue to use as a cruise contingency berth. No cruise facility improvements are proposed. The existing Piers 19 and 20 cruise operation security plan remains in place.
3. Piers 1 and 2 Combined Cruise and Cargo Operations (Slides 64 and 65)
   a. Piers 1 and 2 can accommodate two standard-sized cruise vessels simultaneously (Length = 965 to 1,150 FT, Beam = 125 to 150 FT).
   b. Piers 1A and 1B can accommodate a transfer of 30 to 50 port call days per year from Piers 10 and 11 (based on the 2019 Cruise Ship Port Calls data).
   c. No permanent cruise facility improvements will be constructed makai of the Pier 2A knuckle.
   d. Pier 1 Cruise Berth Alternatives:
      i. Alternative Option 1
         a. Use temporary barriers and awnings at the pier side to direct passengers to the Pier 2 Cruise Terminal.
         b. Conduct ground transportation from Pier 2 Terminal. Ship provisioning and service vehicles would access through the Pier 1 yard and be staged pier-side adjacent to the vessel.
         c. Restrict Pier 1 berthing to port calls or partial turns (i.e., no more than 500 passengers).

ii. Alternative Option 2
    a. Construct a partially retractable elevated walkway to the existing Pier 2 terminal building or a new terminal building at Pier 2A (see Slide 66 for an example from Port of Saint John, NB, Canada).
        i. The elevated walkway would extend approximately 1,200 FT from the middle of Pier 1 to Pier 2A and have sufficient height to allow vehicles and container-on-chassis to pass underneath. It would be retractable to a storage area mauka of the Pier 2A knuckle.
iii. Alternative Option 3
    a. Consider constructing a new cruise terminal building integrated with the existing terminal building.
        i. The new cruise terminal building can be a temporary facility or a permanent structure (see Slide 68 for an example of a temporary structure from Port of Los Angeles).
        ii. A new, integrated, hardened terminal structure could also serve as a resiliency storage and staging area.
    b. Conduct ground transportation from the Pier 2 Terminal. Ship provisioning and service vehicles would occur through the Pier 1 yard and be staged pier-side adjacent to the vessel.
iv. Use of Pier 1 for a cruise terminal requires a new security plan.

Discussion:

See comments and questions from PAC participants in Section I.7 for the Maritime Use – Aloha Tower Area discussion.

K. Pier 60 (presented by Jim Niermann, RMTC) Presentation Slides 69 – 70.

1. Raise the Pier 60 pier and yard and fill landside areas for 3.2-FT SLR.
    a. Requires extensive fill to surcharge the land. This may be prohibitively costly, particularly under the current revenue constraints.
2. Pave and harden the HC&D yard surface for bulk aggregate storage.
3. Develop the inland areas for car storage, containers on chassis storage, or other maritime use.
4. Acquire right-of-way (ROW) to improve street layout/circulation and develop a new public access commercial street to create business frontage along the inland landside areas. Consider a public private partnership to redevelop this area.

Discussion:

There were no further comments and/or questions from the PAC participants.

L. Non-Maritime Alternatives Aloha Tower Area (presented by Laura Mau, RMTC) Presentation Slides 71 – 97. Due to last minute updates during the meeting, slides 83 to 85 and 88 to 95 are slightly different than those included in

the PowerPoint version emailed to PAC participants prior to the meeting. The updated PowerPoint presentation can be accessed and downloaded from the Honolulu Harbor 2050 PAC #3 website: https://honoluluharbormp.com/pac3

1. Considerations (Slide 72)
    a. Several areas of concern that inhibited development potential for the Aloha Tower Marketplace Area are identified as:
        i. Lack of adequate, convenient parking. Adequate and convenient parking is needed to support retail and commercial uses within the area. Historically, the lack of parking has been challenging, particularly in terms of attracting residents.
        ii. Inadequate connectivity to Chinatown, Downtown, and Kaka‘ako exists due to the visual barrier created by Nimitz Hwy./Ala Moana Blvd.
        iii. Restricted access to the shoreline. Opportunities for public shoreline access are available but limited to Aloha Tower and Pier 38. Access is otherwise largely restricted for most of Honolulu Harbor to ensure the security of maritime operations.
        iv. Traffic congestion during cruise ship port calls.
        v. Irwin Park – DOT-H is proceeding with plans to relocate parking and restore the park. The timing of these plans must be coordinated between the DOT-H, Hawai‘i Pacific University (HPU), and the Irwin Family Trust.
2. Conceptual Interpretive Themes (Slides 73 – 75)
    a. The vision of the Aloha Tower area is based on a healthy appreciation for the layers of harbor history. There are two main areas: early history (Slide 73) and modern history (Slide 74). The HHMP recommendations will consider the most appropriate way to interweave and incorporate the history of maritime use and pre-maritime Hawaiian cultural resources and practices within the harbor.
        i. The Honolulu area was a highly established habitation area, particularly a royal center for the *Ali‘i* (*Kou*).
        ii. Honolulu Harbor is the *Piko* that is figuratively and literally the lifeline for the State of Hawai‘i, particularly O‘ahu.
        iii. Notably, the area located mauka (northeast) of the Aloha Tower Marketplace area was referred to as Kuloloia Beach. Its surrounding areas included a rich history of Hawaiian cultural resources and practices.
            a. A map shown on the top left corner of Slide 73 depicts the current shoreline at the Aloha Tower Marketplace area overlain by a historical shoreline map from 1810 (The historical map was previously shared by Mr. Manny Kuloloio).
        iv. King Kalakaua’s Boathouse at Pier 7 (photograph shown in the top right corner of Slide 73) is another touchstone to the King’s presence and influence on the harbor area.

v. There are numerous Land Commission Awards throughout the Honolulu Harbor (map shown in the bottom right corner of Slide 73).
vi. Modern history of the Honolulu Harbor includes:
    a. Whaling/Trade/Shipping
    b. Dredging
    c. Military Shipbuilding
    d. Cargo/Stevedores activities
    e. Pilots/Navigation
    f. Cruise Ships/Boat Days/Aloha Tower
vii. Other opportunities to highlight Honolulu Harbor history include:
    a. The Hōkūleʻa, tied to the Polynesian Voyaging Society (PVS)
    b. Kamehameha Pier
    c. Pākākā (Canoe Landing) at Pier 11 (the original shoreline)

b. The interpretive themes for the Aloha Tower area are based on the concept of Honolulu Harbor as the *Piko* of the islands, in terms of the past, present, and future. The idea of *Piko* would include:
    i. Strengthen and reconnect the community to the shoreline.
        a. There was a stronger connection between the community and the harbor in the past. The community used to gather along the shoreline and have access to the area.
        b. The Project Team understands the primacy for maritime uses and the security issues as DOT-H moves forward with implementing some of the Master Plan ideas. However, there may be opportunities to accommodate special events and greater public participation in the harbor while respecting those constraints.
    ii. A new cultural heritage center with permanent exhibits that honors the rich multi-faceted history of the harbor.
    iii. Reinvigorate the harbor with annual celebrations such as canoe regattas, Hōkūleʻa/PVS educational events, or Boat Days (see photograph of Tug Hula Contest provided by Bill Anonsen on the bottom left corner of Slide 75).

3. Aloha Tower Area – 2050 Vision Design Guidelines (Slides 76, and 79 – 80)
    a. Proposed design guidelines, referenced from the Secretary of the Interior's (SOI) Standards for Historic Properties (https://www.nps.gov/tps/standards.htm), for the Aloha Tower area with historical considerations for the materials, scale, context, views, and orientation are:
        i. Using similar materials between historic and new structures to create continuity.
        ii. Being mindful of the level and quality of textures and details to create a relatable human scale.
        iii. Using a variety of massing and streetscape to leverage visual and physical connections throughout the area.
        iv. Observing appropriate setbacks as they affect visibility or prominence from the street, i.e., sightlines to Aloha Tower.

v. Being mindful that permanent additions to the area will change its character; minimize destruction to the identified historic resources.

b. Piers 5 and 6 Redevelopment (Slide 79)
   i. It is anticipated that Piers 5 and 6 will be redeveloped through a public private partnership among ATDC, DOT-H (for waterfront facilities) and a third party.
   ii. Piers 5 and 6 redevelopment concepts include a mixed-use structure with a multi-level parking structure and various improvements to activate pedestrian spaces. Potential uses within the mixed-used structure include:
      a. Retail/commercial/office
      b. Cultural heritage/education center
      c. Day excursion/tour retail front/offices
      d. Boutique hotel
      e. Maritime museum
   iii. Parking decks within the parking structure should be flat to allow for repurposing should parking demand decrease in the future.
   iv. Improve the waterfront with a continuous pedestrian path, landscaping and other pedestrian features. Maintain existing park space at the end of Piers 5 and 6.
   v. The preliminary ideas for Piers 5 and 6 will require more thought and will be heavily influenced by whoever partners with ATDC and DOT-H.

c. Waterfront Promenade / Streetscape (Slide 80)
   i. Consider 15-FT wide (minimum) sidewalks fronting Pier 7 to support bus drop off/pick up area and street festivals.
   ii. Benches and bus shelters at the extended bus pullout near Pier 7.
   iii. Interpretive displays and/or signage to share the rich and varied history of the harbor.
   iv. Artistic pavements relevant to the history/culture of the harbor on the sidewalks to highlight the pedestrian spaces and activate the streetscape.
   v. Consider design features in the center islands of the proposed roundabouts (as shown in Slides 77 to 78 and 81 to 90), such as public art features or maritime artifacts.
   vi. Consider landscape materials that are native, hardy, easy-to-maintain species.
   vii. Street trees – such as native kou to honor historic name for the area.

4. Interim Plan – Aloha Tower Area (Slides 77 – 78)
   a. The Interim Plan and the alternatives were created based on DOT-H, ATDC and stakeholder input, the Project Team's analysis, and a Traffic Assessment of the Aloha Tower area. The Interim Plan depicts one alternative to facilitate the restoration of Irwin Park and accommodate parking requirements before the future full redevelopment of the area envisioned for 2050.

b. Access points and circulation pattern for the Interim Plan includes:
    i. Maintain the two-way lanes, one ingress, and two egresses from the Fort St. intersection at Aloha Tower Dr.
    ii. Maintain the two-way lanes, two ingresses and egresses from Bishop St. One lane will ingress directly across Bishop St.
    iii. Maintain the left-turn ingress from Ala Moana Blvd. into Richards St.
    iv. Maintain the egress from Aloha Tower Dr. to Ala Moana Blvd.
    v. Consider two roundabouts: a 100-FT diameter roundabout at Bishop St. and Aloha Tower Dr., and a 120-FT diameter roundabout at Richard St. and Aloha Tower Dr.
        a. The roundabouts are a solution to mitigate the Aloha Tower area traffic impact on Nimitz Hwy./Ala Moana Blvd. Vehicles that are unable to find parking at Aloha Tower typically circulate onto Nimitz Hwy./Ala Moana Blvd. and back into Aloha Tower until they find a parking space. The roundabouts keep the vehicle circulation within the Aloha Tower area.
c. The existing parking inventory is approximately 500 stalls, including Irwin Park, the area fronting Hawaiian Electric Company (HECO), Richards St., Mini Park, and lot at Piers 5 and 6.
d. The Interim Plan will have a total of 409 parking stalls including the existing parking stalls and the 18 new overflow parking stalls in the Mini Park.
e. Land use at Piers 10 and 11 accommodates 46,700 square feet (SF) of developable building footprint within each of the pier sheds.

5. Aloha Tower Area – 2050 Vision Alt 1 -Split-Block (Slides 81 – 85)
    a. The concept includes PPP development of separate multi-use structures at Piers 5/6 and at the Mini Park, divided by the east-bound only Aloha Tower Drive lane that exits onto Ala Moana Boulevard.
    b. The circulation pattern for Alternative 1 -Split-Block is the same as the Interim Plan.
    c. Irwin Park will be restored for park use and will not contain parking. Existing on-street and Irwin Park parking will be reduced from 197 stalls to 72 on-street parking stalls along Aloha Tower Drive, Bishop Street and Richards Street. The remaining parking would be provided in a new structure at Piers 5 and 6, and possibly in the Pier 10 and 11 sheds.
    d. Estimated developable building footprint includes:
        i. Pier 11: 46,700 SF
        ii. Pier 10: 46,700 SF
        iii. Piers 5 and 6: 105,350 SF
        iv. Mini Park: 34,550 SF
    e. Slides 83 to 85 are in-progress renderings created for the PIM and to show the PAC members how the Aloha Tower area might appear with the Alternative 1 -Split-Block scenario.
        i. The makai end of Piers 5 and 6 will retain the open space.

   ii. HHMP Design Guidelines will function as recommendations only. It will be up to a future development partner to willingly abide by the guidelines, or up to ATDC to require that a development partner adhere to them.
   iii. There are two shadings in the block structure to show a sense of scale. The darker shade of the structure represents a four-story building and the parking space required to fulfill HPU's lease parking requirements. The top lighter layer represents ten stories to be in line with the height of existing HECO building.
   iv. Piers 5 and 6 pier faces in the renderings were expanded and straightened to give a better berthing area. Landscaped edges are also proposed to create an inviting space along the waterfront for pedestrian enjoyment and for day excursion-related operations and entertainment, such as hula shows and passenger queuing.
   v. The rail is also shown integrated into the Aloha Tower area. The 3-D rail model is an older version and may not accurately reflect HART's current/future plans.
   vi. Pavement colors and patterns are a play on history. Designs are derived from fishnets, the Royal Order of Kalakaua because his boathouse was located around Pier 7, and paddles to emphasize the pedestrian spaces and make a stronger connection to Downtown.

6. Aloha Tower Area – 2050 Vision Alt 2 -Superblock (Slides 86 – 90)
   a. Alternative 2 -Superblock consist of a consolidated parcel and structure the spans the Mini Park and Piers 5 and 6.
   b. The ingress on Richards St. would be maintained, and an exit onto east-bound Ala Moana Boulevard is added to minimize traffic congestion.
   c. The exit from Aloha Tower Dr. to Ala Moana Blvd. would be blocked by the new superblock structure containing internal parking. The parking structure could exit onto Aloha Tower Drive and east-bound Ala Moana Boulevard.
   d. Irwin Park will be restored for park use and will not contain parking. Existing on-street and Irwin Park parking will be reduced from 197 stalls to 54 on-street parking stalls along Aloha Tower Drive and Bishop Street. The remaining parking would be provided in the new structure at Piers 5 and 6, and possibly in the Pier 10 and 11 sheds.
   e. Estimated developable building footprint includes:
      i. Pier 11: 46,700 SF
      ii. Pier 10: 46,700 SF
      iii. Piers 5 and 6 and Mini Park: 143,250 SF
   f. Slides 88 to 90 are in-progress renderings to show the PAC members how the Aloha Tower area might appear with the Alternative 2 - Superblock scenario.
   g. Aloha Tower Area – 2050 Vision Streetscape Renderings (Slides 91 to 95). Renderings of the streetscape show a pavement motif that could be added along the pedestrian walkway to improve the pedestrian

experience and incorporate culturally and historical designs. Use of motifs and any cultural and historical designs will be determined through consultation with cultural practitioners and descendants from the harbor area.

Discussion:

- *Is the traffic pattern realistic with the bus pullout area and the rail station at the corner of Bishop Street and Nimitz Highway? There may be more buses transiting through and cars parking in the area, so is there more thought regarding this? (Refer to Slide 92 for visual reference.)*
  - Yes, the original concept did not have roundabouts until the traffic engineer recommended adding them to the intersections of Bishop Street and Aloha Tower Drive and Richards Street and Aloha Tower Drive. The idea was to allow the local traffic to circulate within the Aloha Tower area as opposed to having to exit the area and circle through Downtown and back to look for parking.
- *CCH's policy is for growth in traffic to be accommodated primarily through pedestrian and bicycle modes of transportation. Therefore, CCH supports the idea of roundabouts, sidewalks, and bicycle lanes. Roundabouts are the most efficient intersection design in terms of safety. Another of CCH's policy is to encourage access to the rail station by bicycle or drop-off by car, so the roundabout at Bishop Street and Aloha Tower Drive is an appropriate location.*
- *[via chat] Would like to stress that signage that helps with direction and for cultural/educational purposes are important. Planning for possible current technology to help visitors and locals alike, to learn more about the area.*
- *The Project Team should remember the purpose of the non-maritime efforts around the Honolulu Harbor (particularly the Aloha Tower area) is to assist the visitors and residents with a heightened experience and sense of place. Kaka'ako and Downtown are growing residential areas. Additionally, signage is super important to connect visitors and residents to the cultural and historical sense of place in the area. From an environmental perspective, signage can provide an opportunity to educate visitors and locals on the marine life and natural assets within the area. The Project Team should consider where signage will be located, how much to place, and incorporate it with technology/infrastructure for interactive signage to engage both residents and visitors. There needs to be more discussion about signage, education, and the value of the Aloha Tower area for residents and visitors to develop more respect for the area.*
- *[via chat] The City is developing a detailed wayfinding master plan for the rail station neighborhoods - both lead to stations, shopping, other destinations (like the cruise terminal). HDOT and other agencies are*

in the loop on that and CCH will have a public review of wayfinding concepts in the next few months. Since you can't fit a lot of information on signs, the City is also developing a wayfinding/transit app that can add/link to the kinds of historic, cultural, and community information you mentioned (starting with some of the cool stories HART has gathered so far). One long-term goal is that the app can be used by visitor industry for visitors to explore even before they get here.

- *Is there anything that is legally preventing either modification or demolition of the existing structures/buildings on Piers 10 and 11, such as the building's status as being historically significant or being listed on the federal or state register of historic places?*
  - The Piers 10 and 11 sheds bring historic character to the Aloha Tower area and have been determined eligible for listing on the National Register of Historic Places. They are not, however, currently listed on the National or Hawai'i Registers of Historic Places. The Project Team intends to recommend maintaining the buildings' exterior and footprint. However, developers could modify the interior to add another level within the historic structure. This would create more internal space for retail use or cruise operations for a post-COVID-19 health standard, while maintaining the historic character and feel along the Aloha Tower corridor and view plane. The buildings' footprints are rough estimates and not based on surveyed plans. The Project Team consulted with historic architects regarding developing the buildings and they do not recommend altering the exterior of the buildings since it is an eligible structure. Any development/alteration to the buildings' interior or exterior will need to be done in consultation with the Architecture Branch of the Hawai'i State Historic Preservation Division (SHPD).
  - The estimated developable building footprint for the Mini Park and Piers 5 and 6 are the base building footprint, so any additional stories above the ground-level would increase the SF by multiples of the base building footprint.
- *A problem with using Piers 10 and 11 for cruise ships with a full turn is the structure has so many vertical posts, which make it inefficient for 45-FT container trucks to back-up and unload. That is why most cruise ships prefer to berth at Pier 2 for full turns. The Master Plan should identify modifications to Piers 10 and 11 that would be more service-friendly for various vessels, vendors, and contractors. It should also identify architectural or engineering strategies that make Piers 10 and 11 easier to utilize on busy cruise ship turn days. The Master Plan should pursue keeping Piers 10 and 11 as an alternative berth for cruise ships.*
- *[via chat] Good point by Captain Enos!*

- *If the intent is to preserve the cultural utilization of Piers 10 and 11 and how it relates to the maritime industry on the waterfront, then Piers 10 and 11 should be maintained as a secondary berth for cruise ships. The cruise terminal should be maintained since it is part of the history of the area. The Project Team has considered how to move cars and people in the area; however, with respect to cruise operations, there is not enough space on the roadways. When cruise ships berth at Piers 10 and 11, the ship is being provisioned while passengers are debarking/embarking. Most of the ship's time at berth will be doing provisioning work, which requires approximately 10 to 12 45-FT container trucks queueing and waiting to unload towards the back section of Pier 10. The Master Plan should consider how much space can be added to make cruise operations (port calls, partial turns and full turns) more efficient.*
- *[via chat] Agree with efforts to keep a visual "Hawaiian sense of place" on the waterfront, while working towards more efficient use of limited space.*

7. Aloha Tower Area – 2050 Vision Design Concepts (Slides 96 – 97)
   a. *The HHMP is looking at Woonerfs* (Dutch concept of a "living street") / Shared-Street Concept) as a model for the Aloha Tower area's streetscape.
      i. Develop shared pedestrian and vehicle space along Aloha Tower Drive, particularly the segment between Bishop Street and Richards Street.
      ii. Use different pavement textures and colors to indicate travel ways and flexible-use areas (e.g., convert parking stalls to seating, food trucks, and event space). Use moveable planters to define use areas, as necessary.
         a. Enables converting areas within the Aloha Tower area for special events.
      iii. See Slide 96 photo examples from Kalamazoo, MI and Baltimore, MD.
   b. Sidewalks and Pavement Design
      i. Incorporate patterns, colors, materials, text, and/or images to highlight historical and cultural themes.
      ii. The Aloha Tower area can do something similar to what is planned for the Ward Village sidewalks along Auahi street – integration of patterned designs and Hawaiian lyrics into sidewalks and pathways.

Discussion:

- *The CCH strongly supports the concept of shared-streets and is developing the new standard/design details for shared-streets. There are a few upcoming workshops that are pushing CCH to come up with a standard for these streets. The shared-street concept might be*

ideal for some of the Diamond Head-Ewa streets in the Aloha Tower area, particularly between the Alternative 1 -Split-Block concept.

M. Boundary Treatments (presented by Laura Mau, RMTC) Presentation Slides 98 – 102.

1. The suggested boundary edge treatments are to provide aesthetic consistency along the Nimitz Highway boundary, and ensure security for secured areas.
2. Considerations for implementation are:
   a. Cost
   b. Maintenance requirements
   c. Public visibility
3. Utility Fence (Slide 100)
   a. Chain link fence with green rubber coating and barbed wire top.
   b. Standard treatment along industrial harbor areas.
   c. Meets security requirements.
   d. Low-cost and easy to maintain.
4. Decorative Fence (Slide 101)
   a. Anodized, marine-grade aluminum picket fence, with or without concrete footing.
   b. Use in high-visibility areas and special facilities such as the Aloha Tower area, future maritime center, cruise terminal and Pier 38 fishing village.
   c. High-cost to install, difficult and costly to maintain.
5. Landscape (Slide 102)
   a. Landscaping can be used along non-secure areas to improve the appearance and at major driveway entrances to provide landmarks and a visual cue for orientation.
   b. Use low-maintenance, drought-tolerant native plant species where possible.
      i. Consider using Naupaka or Kokiʻo keʻokeʻo (Hawaiian white hibiscus) for hedges; and
      ii. Kou trees, coconut, or plumeria trees for shade and visual cues.

Discussion:

- *[via chat] Quick note on landscaping, kou seed pods are round like marbles, not great for landscaping.*
- *[via chat] I* [Harrison] *took notes with slide numbers and have detailed comments on the non-maritime/land use/ transport network slides (slides 77 to 102). I will try to find time to write those notes up and send them to Jim. Please nudge me next week if not received. Mostly related to street/network design, street trees, parking, bike lanes, roundabouts, fences, etc.*
  - [via chat] Thank you Harrison. We look forward to receiving further input from you.

N. Preliminary Project Prioritization (presented by Jim Niermann, RMTC)
Presentation Slides 103 – 109.

1. Prioritization Criteria (Slide 104)
   a. Master Plan project prioritization considers the following criteria:
      i. Logical sequence
         a. For example, after KCT opens and Pasha moves from Piers 1, 2, and 51, there will be opportunities to work on the vacated areas with reduced impact on harbor operations.
      ii. Conditions assessment/end of asset life cycle
      iii. Synergy with other project(s)
         a. For example, include resiliency improvements as piers are reconstructed due to life-cycle deterioration.
      iv. PPP opportunity
      v. DOT-H CIP Criteria
         a. Safety
         b. Operational Efficiency
         c. Court Mandate
         d. Revenue Generation
         e. Preservation of Assets
         f. Energy Efficiency
      vi. Affordability – including the ability to generate revenue.
         a. For example, the Pier 1 and 2 improvements will be costly. Due to the relatively low utilization at Piers 1 and 2 after Pasha moves, the ability to generate revenue from those piers to support financing the improvements will be severely constrained.
      vii. SLR – Improvements to address SLR will, under certain conditions, require priority attention.
      viii. Rough Order of Magnitude (ROM) cost estimates will be used to assess relative cost and affordability among the projects, but will not be the ultimate determinant of priorities.
   b. Project prioritization in the Master Plan does not dictate which harbor projects will come first. DOT-H will make an assessment based on available finances, revenue, and the harbor's priorities at that time. The Master Plan will provide information for DOT-H to consider when it comes time to assess the projects for execution.
2. Prioritization: High-Medium-Low (Slide 105)
   a. The preliminary prioritization is sequenced in high, medium, and low priority instead of the 10-, 20-, and 30-year increments previously presented at the PAC Meeting #2. Specific time frames are difficult to determine at the master plan phase and will ultimately be determined by DOT-H. Projects may be moved forward sooner or delayed. Preliminary high, medium and low priority projects are listed below.
   b. High Priority
      i. Pier 1 Reconstruction

ii. Interisland Terminal Improvements
iii. Piers 19 and 20 Reconstruction
iv. Piers 21 and 22 "Tug Row" Improvements
v. Pier 29 Apron Reconstruction
vi. Pier 51 Improvements
vii. Piers 52 and 53 Improvements

c. Medium Priority
   i. Demolish Silos
   ii. Piers 22 and 23 Reconstruction
   iii. Piers 5 and 6 Reconstruction
   iv. Pier 60 Improvements
   v. "Tyco Pier" – Layberth Dolphins
   vi. Piers 31 to 34 Reconstruction

d. Low Priority
   i. Pier 16 Widening
   ii. Pier 36 Extension
   iii. Pier 38 New Berth Construction

e. Opportunistic (category that will need a PPP, private investments, or a long-term lease with a maritime partner)
   i. Non-Maritime Improvements
   ii. Cruise Terminal Consolidation
   iii. Pier 23 Maritime Center
   iv. Piers 12 to 14 Improvements

3. Sequence – High Priority (Slides 106 – 107)
   a. Interisland Terminal Improvements
      i. Based on the poor condition of the piers and yards.
      ii. The terminal provides the opportunity for revenue generation as it is an active cargo pier. The wharfage fees will continue to generate revenue for DOT-H.
      iii. Improvements do not depend on KCT to start.
   b. Pier 29 Apron Reconstruction
      i. Relatively smaller investment to upgrade the apron to make it a fully functioning pier. This improvement complements the recently completed yard strengthening project.
      ii. The cost is easier to be covered through the wharfage fees compared to larger improvement projects, such as Pier 1 reconstruction.
   c. Piers 19 and 20 Reconstruction
      i. Piers 19 and 20 reconstruction may be a prerequisite for the Maritime Center to ensure that the pier foundation can support the Maritime Center structure. [Note: The 2012 Conditions Assessment Study of Harbor Waterfront Structures, prepared by DOT-H rated Piers 19 and 20 condition as "satisfactory".]
      ii. Piers 19 and 20 are highly utilize by cargo carriers, therefore the development cost is easier to recover through the wharfage fees.
   d. Piers 21 and 22 "Tug Row" Improvements

i. Improvements are necessary due to the condition of the buildings and pier, and due to the essential function that the tug operators serve in the harbor.

e. Piers 1 and 2 Reconstruction
   i. Piers 1 and 2 improvements are prioritized to support the piers' function as a primary resiliency pier.
   ii. Improvements will wait for KCT to open and the piers to be vacated to begin reconstruction.
   iii. If another terminal operator decides to invest in these piers, it could become a higher priority. The concern for reconstructing these piers is the investment to reconstruct the piers without the ability to repay the financing. The current utilization rate at Piers 1 and 2 is 30% and is expected to drop after Pasha moves to KCT. Wharfage fees at that utilization rate will not support financing the reconstruction costs.
f. Pier 51 Improvements
   i. Improvements will wait for KCT to open and the piers to be vacated to begin reconstruction.
   ii. Based on the terminal operator's requirement.
g. Piers 52 and 53 Improvements
   i. Based on the terminal operator's requirement.
h. Initiate Harbor Entrance Widening Study and the Kalihi Channel Bridge Replacement Study with USACE
   i. This will require a long lead time for the feasibility study, environmental review, and financing.
   ii. DOT-H already initiated the request.

4. Sequence – Medium Priority (Slide 108)
   a. "Tyco Pier" – Layberth Construction
      i. The acquisition of Tyco Pier is already initiated.
      ii. This pier will provide layberth for the harbor in the long-term, but there are workarounds in the short-term.
   b. Demolish Silos
      i. Silos constrain efficient use of valuable port facilities.
      ii. This is a prerequisite for developing the Maritime Center.
   c. Piers 22 and 23 Reconstruction
      i. These piers are underutilized due to narrow slipway and poor conditions.
      ii. This is a prerequisite for developing the Maritime Center.
   d. Pier 23 Maritime Center
      i. Long lead time to plan and finance Maritime Center development.
      ii. Potentially dependent on a PPP.
   e. Pier 60 Improvements
      i. Long lead time with a high cost.
      ii. May potentially provide long-term revenue.
      iii. Lower priority than cargo terminal improvements.
   f. Piers 31 to 34 Reconstruction

   i. There are on-going projects to improve the pier and yard function for general cargo use. On-going projects include demolishing the sheds, improving pavement, and providing lighting and comfort stations.
- g. Piers 5 and 6 Waterside Reconstruction
   i. Develop concurrently with the redevelopment of the landside area.
   ii. Improve Piers 5 and 6 by replacing the dolphins with straightened and extended concrete piers.
   iii. May occur with a PPP.

5. Sequence – Low Priority (Slide 109)
   a. Pier 16 Widening
      i. Undertake when the pier reaches the end of its functional life.
   b. Pier 36 Extension
      i. There are existing workarounds for berthing in the short-term as there is added berthing from P&R taxi relocation.
      ii. Extension of the pier is a high cost improvement.
   c. Pier 38 New Berth Construction
      i. Low priority due to high construction cost and existing, available workarounds.
      ii. There will be added berthing when P&R Water Taxi relocates from Pier 36 to Pier 23.

Discussion:

There were no further comments and/or questions from the PAC participants.

K. Next Steps (presented by Jim Niermann, RMTC) Presentation Slides 110 – 111.

1. The Project Team will refine the Master Plan alternatives and Project Prioritization based on the PAC members' comments. The Project Team will follow up with PAC members for additional feedback on the Master Plan alternatives and Preliminary Project Prioritization.
2. The TAC Meeting #2 will be held in November or December. [Note: TAC #2 is tentatively scheduled for December.]
3. The first PIM may occur in December 2020 or January 2021. [Note: PIM #1 is tentatively scheduled for January/February 2021.]
4. The Project Team will start to finalize the Master Plan after the PIM.
5. The Project Team will present the pre-final Master Plan in the fourth PAC meeting in February or March.
   a. The Project Team will respectfully request the PAC members to endorse the HHMP in the PAC Meeting #4.
   b. After PAC Meeting #4, the HHMP will be sent to the DOT-H Deputy Director and Governor for review and approval.
6. HHMP will be complete by April 2021.

End of Presentations

L. Closing Remarks and Final Comments from PAC Participants

- *[via chat] I have to leave for another meeting, but before I do I just want to thank Celia Shen and the RM Towill project team for doing such an awesome job in getting the master plan to this point in the process. I hope all harbor stakeholders can recognize and appreciate the amount of work that has gone into getting us to this point with full transparency. MAHALO!*
- *[via chat] Education moment - still two more months of hurricane season!*
- *Mr. Manny Kuloloio thanked the Project Team for the ongoing discussions and outreach. Mr. Kuloloio supports the concept of creating a Hawaiian sense of place at Honolulu Harbor and that it is the Piko for all harbors in Hawai'i. Mr. Kuloloio also supports the concepts of more usable Piers 10 and 11, canoe races/regattas/special events within Honolulu Harbor, the Maritime Center, and creating statues of Kū. Mr. Kuloloio shows his Aloha and support to the PAC members and the Project Team.*

M. Conclusions and Follow-Up

1. The Master Plan alternatives and Preliminary Project Prioritization will be refined based on the PAC Meeting #3 input and additional PAC members' feedback. The refined Master Plan alternatives will be presented for additional input and refinement in the future TAC and PIM meeting.

2. The Project Team will follow up with the PAC for further discussion or feedback and notify them of the PAC Meeting #3 notes' availability and future meeting dates. The PAC Meeting #4 may be held in February or March. See the PAC webpage for updates and the exhibits that were presented in the PAC Meeting #3. https://honoluluharbormp.com/pac

3. Any additional questions or comments can be sent through the Honolulu Harbor website and by phone or email to the Project Team. https://honoluluharbormp.com/contact

O. Officially adjourned (4:40 PM)

Master Planning Advisory Committee (PAC) #3 Attendees			
Name	**User Email**	**Sub-TAC Group**	**Affiliation**
Andrew Rocheleau		Maritime Support	Sea Engineering
Arnold Liu		Project Team	Department of Transportation, Harbors Division (DOT-H)
Bill Anonsen		Project Team	The Maritime Group (TMG)
Blaine Gemeno		At-Large (Sause Brothers)	Sause Bros.
Blue Kaanehe		Agency (DLNR)	Administrator, Department of Land and Natural Resources (DLNR)
Carter Luke		Project Team	DOT-H
Celia Shen		Project Team	DOT-H
Christy Martin		Environment	Coordinating Group on Alien Pest Species
Dan Polhemus		Environment	U. S. Fish and Wildlife Service (USFWS)
David Sikkink		Agency (DBEDT-Foreign Trade Zone)	Foreign Trade Zone, Department of Business, Economic Development & Tourism, State of Hawai'i (DBEDT)
David Tanoue		Project Team	R. M. Towill Corporation (RMTC)
Dean Watase		Project Team	DOT-H
Deepak Neupane			DBEDT
Derek Chow			Deputy Director, DOT-H
Derrick Carne			DOT-H
Ed Enos		Vessel Operations	Hawai'i Pilots Association
Eric Leong			Property Manager, DOT-H
Faith Rex		Project Team	SMS Hawaii (SMS)
Harrison Rue		Non-Maritime Opportunities	City and County of Honolulu (CCH), Department of Planning and Permitting (DPP) , Transit-oriented development
James Zane		Cargo Operations	McCabe Hamilton & Renny Co.
Janet Yocum		Adaptation & Resiliency	Federal Emergency Management Agency (FEMA)
Jeffrey Seastrom		Project Team	PBR Hawai'i (PBR)
Jennifer Tomita			Property Manager, DOT-H
Jim Niermann		Project Team	RMTC
Joni Savusa			Property Manager, DOT-H
Joshua Williams		Agency (USCG)	U.S. Coast Guard (USCG)
Kamakana Kaimuloa			DOT-H, Aloha Tower Development Corporation (ATDC)
Kim Lu		Fishing Operations	VAK Fisheries, LLC
Kimi Yuen		Project Team	PBR
Kyle Ensley		Agency (USCG)	USCG
Laura Mau		Project Team	RMTC
Lauren Yasaka			DLNR
Lek Friel		At-Large (Matson)	Matson
Linda Colburn		Project Team	Where Talk Works (WTW)
Manuel Kuloloia		Non-Maritime Opportunities	Kuloloio Ohana
Matthew Gonser		Adaptation & Resiliency	CCH, Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management
Michael Dichner		Project Team	DOT-H
Michelle Marchant		Project Team	RMTC
Noelani Schilling-Wheeler		Cruise & Excursion Operations	O'ahu Visitors Bureau

Master Planning Advisory Committee (PAC) #3 Attendees			
Name	**User Email**	**Sub-TAC Group**	**Affiliation**
Olivia Pham			Property Manager, DOT-H
Peter Pillone		Agency (DOT-H)	Commercial Harbors Manager, DOT-H O'ahu District
Randy Grune		Cargo Operations	Hawai'i Stevedores
Robert Harter		Adaptation & Resiliency	CCH, Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management
Rodney Funakoshi		Agency (State Office of Planning)	Office of Planning, DBEDT
Roslin Arbuckle		Project Team	Stantec Consulting, Ltd. (SCL)
Roxanne Lee		Project Team	RMTC
Roy Catalani		Cruise & Excursion Operations	Cruise Lines International Association (CLIA)
Ruby Edwards		Agency (State Office of Planning)	Office of Planning, DBEDT
Sam Moku		Non-Maritime Opportunities	Hawai'i Pacific University (HPU)
Sam Dorios		Project Team	Hawaii Leadership Forum
Sandra Rossetter		Project Team	DOT-H
Shawn Grzybowski			State of Hawaii Emergency Management Agency
Tiffanie Whitworth		Maritime Support	Young Brothers (YB)
Tomo Murata		Agency (DOT, Statewide Transportation Planning Office)	Statewide Transportation Planning Office, DOT, State of Hawai'i

MEETING NOTES

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Date/Time:	Thursday, November 3, 2022; 8:30 a.m. to 11:30 a.m.
Location:	Homer Maxey Conference Center (in-person participation for PAC) and Zoom Webinar (full virtual participation for PAC and view/chat participation for TAC)
Purpose:	Planning Advisory Committee (PAC) Meeting #4
Host:	Department of Transportation, Harbors Division (DOTH)
Attendees:	Please view **Appendix 3** of the Meeting Documentation

- Notes in [bracketed blue text] indicate supplemental information not explicitly discussed during the meeting.
- *Brown italicized text* indicates comments or questions by PAC participants.
- Brown regular text indicates a comment or response from the Project Team.

A. Welcome/Introductions Presentation Slides 2 – 6.

1. Opening Remarks (presented by Faith Rex, SMS Hawai'i)
   a. DOTH and the Project Team are grateful to all the PAC members for their time and participation in the HHMP planning process. This is the final PAC meeting for the HHMP.

B. Zoom Instructions (presented by Faith Rex, SMS Hawai'i) Presentation Slide 7.

1. PAC members can use the talk or chat features to ask questions and/or provide comments.
2. TAC members can use the chat feature to ask questions and/or provide comments.

C. Meeting Overview (presented by Faith Rex, SMS Hawai'i) Presentation Slides 8 – 9.

1. The purpose of the PAC Meeting #4 is to:
   a. Discuss any final input that will be documented in the project records and may result in HHMP revisions; and
   b. Clarify final steps of the HHMP planning process.

D. Planning Process and PAC Role (presented by Jim Niermann, R. M. Towill Corporation [RMTC]) Presentation Slides 11 – 14.

1. Planning Process
   a. The HHMP planning process was initiated in 2018 and has included over 86 individual stakeholder interviews, as well as the PAC, Technical Advisory Committee (TAC), and Subject Matter Specialized Technical Advisory Committee (Sub-TAC) meetings.
   b. Ideas that were identified during the early TAC and Sub-TAC meetings were refined through an iterative process during PAC #1 through 3 and TAC #2. The development alternatives were then presented to the public in a Public Information Meeting (PIM) and the Kānaka Maoli community in Early Cultural Engagement meetings.
   c. The Planning Team has been preparing the Master Plan document, which is being presented in this PAC #4 for final input. All PAC #4 comments will be documented in the HHMP and may result in revisions to the plan. The Final HHMP will be sent to the DOTH Administration and Governor for review and acceptance.
2. PAC Role
   a. The PAC's role is advisory only; it is not a decision-making body nor is the HHMP a decision-making document. The HHMP provides recommendations for consideration by the DOTH Administration and O'ahu District. All final decisions regarding future development in Honolulu Harbor will be made by the DOTH Administration and O'ahu District to best serve the needs of the maritime community.
   b. An endorsement statement will not be requested due to the logistical challenges with obtaining signatures. Instead, the HHMP will include an acknowledgement of everyone's participation / contribution to the HHMP.

E. HHMP 2050 Content Presentation Slides 15 – 16.

1. Chapter Overview
   a. Chapter 1 – Executive Summary: Overview of HHMP
   b. Chapter 2 – Introduction: HHMP purpose, mission, goals, and planning process
   c. Chapter 3 – Background and Content: Honolulu Harbor's regional, land use, environmental, economic, historical, cultural, and architectural resources, as well as other site-specific information
   d. Chapter 4 – Existing Facilities and Operations: Honolulu Harbor's physical facilities, infrastructure, harbor operations/users, and safety/security services and facilities
   e. Chapter 5 – Future Facility Demand Assessment: HHMP's 2050 cargo projections, capacity and needs assessment, projected spatial demands, and berth utilization/layberth analysis

f. Chapter 6 – Land Use Plan: Honolulu Harbor's existing land uses and the HHMP's recommended land use alternatives based on the capacity and needs assessment and operational requirements
g. Chapter 7 – Development Plan: HHMP's recommendations for harbor-wide and pier-specific improvement and description of development constraints
h. Chapter 8 – Additional Recommendations: HHMP's general recommendations for infrastructure improvements and historical, cultural, and architectural resources, as well as issues that extend beyond the scope of the HHMP and/or require multijurisdictional coordination
i. Chapter 9 – Implementation Plan: HHMP's phasing/prioritization, cost estimates, and permitting requirements for recommended improvements
j. Chapter 10 – References: Bibliography
k. Appendices – Meeting documentation, technical studies, resource inventories and other resources

Discussion:

- *The original statistic that 80 percent of products are imported to Hawai'i may have originated from a 2002 Mercator Group report and was further used by Leroy Laney for a report that studied the economic impact of the harbor on the Hawai'i community.*
  - The Project Team noted that during their research the first instance of the original statistic was used in the 1980s. Based on currently available data, it was determined that approximately 85 percent of goods are imported to Hawai'i and of those, approximately 91 percent arrive through the commercial harbor system. This percentage excludes crude oil that enters the State via the single-point mooring.

A. General Overview and Key Recommendations (presented by Jim Niermann, RMTC) Presentation Slides 17 – 24.

1. Non-Exclusive Multi-Purpose Cargo Terminals (Slide 17)
   a. Reconstruct terminals with sheet pile / bulkhead for better resiliency over time.
   b. Prioritize renovating Piers 1 and 2 to serve as the resiliency piers with hardening the yard and installing heavy lift pads for post-disaster emergency staging.
2. Non-Exclusive Dedicated-Use Cargo Terminals (Slide 18)
   a. Balance berth and yard capacities (primarily the responsibility of operators).
   b. Relocate existing buildings to the perimeter of the yard or an offsite area once they reach the end of their useful lifecycle.
   c. Internalize truck traffic / remove truck traffic from the public roads.
   d. Infill a portion of the slipway between Piers 39 and 40.
3. Maritime Support (Slide 19)

a. Provide long-term leases to incentivize private investment in the piers.
b. Pier 21
    i. Improve Tug Row with sheet pile / bulkhead construction.
    ii. Reconstruct existing buildings as shared-use office and warehouse facilities.
c. Pier 22-23
    i. Redevelop as a fully serviceable pier by cutting back pier face to widen the slipway and removing coral outcroppings.
d. Pier 19-23
    i. Develop maritime center as a multistory building with offices, auto storage, and parking for maritime employees.
e. Pier 60
    i. Either elevate and pave backlands as open storage for containers or chassis or redevelop as industrial space with roadway improvements.

4. Commercial Fishing Piers (Slide 20)
    a. Pier 16
        i. Widen pier to allow truck / vehicle access for servicing, provisioning, and/or fueling.
    b. Pier 18
        i. Develop respite center with basic amenities (e.g., bathrooms, showers, laundry facilities, etc.) for fishing crew.
    c. Pier 33-38
        i. Expand berthing for fishing fleet.
        ii. Replace Pier 37 with a floating dock when it reaches the end of its useful lifecycle.
5. Passenger Operations (Slides 21 and 22)
    a. Alternative 1 – Maintain the status quo but improve Piers 10/11 shed and Pier 2 Cruise Terminal for improved ground transportation and pedestrian circulation.
    b. Alternative 2 – Consolidate cruise operations at Piers 1 and 2 and eliminate cruise operations from Piers 10/11.
        i. No passenger processing would occur at the Pier 1 berth. Passengers would either walk along the pier apron or take a shuttle to the Pier 2 Cruise Terminal building. All ground transportation would occur at Pier 2. However, provisioning would occur pier-side for vessels berthed at Pier 1.
        ii. Options for passenger processing include: 1) renovating the existing Cruise Terminal building to expand capacity to simultaneously process passengers from two cruise ships; 2) installing a temporary tension fabric structure on approximately 1 acre of area (makai of the Pier 2 Cruise Terminal) for temporary passenger processing; or 3) constructing a new multiuse, reinforced concrete structure for passenger processing and disaster response (makai of the Pier 2 Cruise Terminal).

c. A consolidated terminal at Pier 2 does not necessarily preclude the option to continue use of Piers 10/11 for cruise operations, thus accommodating berthing for up to three vessels simultaneously.

6. Public Waterfront (Slide 23)
   a. Fishing Village – The landside area will remain essentially the same since the long-term lease agreement with the Commercial Fishing Village Association of Apartment Owners (AOAO) extends beyond the 2050 planning horizon.
   b. Aloha Tower Complex – The landside area is under the jurisdiction of Aloha Tower Development Corporation (ATDC) and the waterside area is under the jurisdiction of DOTH. The HHMP provides recommendations for the redevelopment of the area, but final decisions will be made by ATDC in consultation with DOTH. Recommendations include pedestrian improvements, a multistory building at Piers 5 and 6, and improvements to Piers 10 and 11. HPU will remain the same since the long-term lease agreement with HPU extends beyond the 2050 planning horizon.
7. Harbor-Wide Improvements (Slide 24)
   a. Widening the main entrance channel.
   b. Develop a notch at Piers 31 – 33 to allow cargo vessels to tuck in and create more space in the Kapālama transit channel.
   c. Replace the existing Kalihi Channel bridge with a new spring or bascule bridge with an air draft that allows passage of tug, barge, fishing, or other work boats to eliminate congestion at the main entrance channel. During an emergency where the main channel entrance is blocked, the new bridge would open to allow emergency access for large vessels. This would require reauthorizing the Kalihi Channel draft depth from 23 feet (FT) to 45 FT from the harbor all the way out to Mamala Bay.

Discussion:

- *The HHMP should reference the environmental compliance issues associated with widening the various entrances and channels. The main entrance channel is bordered by platform reefs and seagrass on both sides. Both coral reefs and seagrass will require mitigation; however, seagrass is easier to mitigate. The Kapālama Channel has legacy environmental contaminant issues. The Kalihi Channel will require refurbishment of the approach channel (e.g., Seaplane Runway, Mokulēʻia Island, etc), which will require dredging and coordination with the Army Corps of Engineers.*
  - The HHMP identifies the environmental compliance issues associated with widening the various entrances and deepening channels.

G. Highlights for Discussion (presented by Jim Niermann, RMTC) Presentation Slides 25-28.

1. Sea Level Rise (SLR) Recommendations (Slide 25)

a. SLR will reduce the freeboard at the pier face, which will affect vessels' ability to operate across the berth. To determine areas of the harbor that would be at-risk due to SLR, the Project Team determined the minimum freeboard required for vessel operations and then applied the 3.2-FT SLR projection to identify areas that would not have sufficient minimum freeboard.
b. Raise yards and/or aprons at all piers. The costs would be significant and equivalent to constructing an entirely new harbor but the costs highlight the seriousness of the problem and the expenses needed to address it.
c. Install elevated mooring system as an interim solution to allow vessels to safely operate across the berth. This is a less-costly interim solution to address the loss of freeboard.
d. Improve drainage in the harbor by installing sump pumps to remove stormwater from the piers and yard. A majority of the existing drainage outfalls are already inundated during high or king tides.
e. Create a SLR Strategic Committee to identify specific strategies for adapting the State's harbors system to SLR. The SLR Strategic Committee will be led by DOTH and involve harbor users, public agencies, and other stakeholders.

Discussion:

- *Earlier in the planning process there were discussions about standardizing pier heights throughout all of Hawai'i's commercial harbors, which would have the environmental benefit of not needing to discharge ballast water in the harbors. Has any of that been retained in the current HHMP?*
  - The HHMP recommends that standard pier heights be established based on the operational requirements of the various types of vessels. For example, for workboats the HHMP recommends a minimum operating pier face freeboard of 3 feet. For cargo vessels the minimum recommended freeboard is 6 feet.
  - During the planning process, there was an initial reference to standardizing pier heights throughout the State's commercial harbors system. The Project Team will make sure that recommendation is included in the HHMP document, with the caveat that the scope of the HHMP is Honolulu Harbor only.
  - The HHMP does discuss ballast water; however, not in respect to how standardizing pier heights relates to ballast water exchange in the harbor. The Project Team will review the current HHMP to see if any revisions need to be made.
- *How do you handle discharging drainage from the piers that may be contaminated with industrial pollutants while ensuring compliance with the Clean Water Act?*

  - The HHMP recommends installing hydro-dynamic water separators (e.g., vortex systems) as part of yard/backland drainage systems to treat water before it is discharged.
- *Typically discharging ballast water in ports is not done and it should not be happening in Honolulu Harbor. Typically, ships entering Honolulu Harbor are offloading, so they would be taking on ballast water, not discharging ballast water.*
  - Ballast water is not discharged in Honolulu Harbor. However, there were discussions early in the planning process regarding the need to accommodate ballast water in onshore tanks so vessels could discharge or take-on ballast water as needed. Ballast water that is discharged to onshore tanks would be recycled and treated. It was determined that this would be the operators' responsibility and so is not included in the HHMP. [Correction: Ballast water discharges do occur in Honolulu Harbor, primarily by cruise ships and special cargo vessels. Ballast water is treated prior to discharge in accordance with federal regulations enforced by the USCG. **Section 4.4.5** in the HHMP describes federal and state regulation of ballast water exchange and biofouling in Honolulu Harbor.]
- *Regulating ballast water used to be under the State of Hawai'i's jurisdiction, however, it was recently changed to fall under federal jurisdiction.*
- *In the HHMP, there is no discussion of how elevating the piers will affect RO/RO operations considering that at times the RO/RO ramp is significantly lower than the pier deck. If you raise the pier by 3 FT, will the RO/RO ships that arrive heavy and low be able to get the bottom of the RO/RO ramp to land securely on the pier apron? Would they be able to put the ramp down during low tide? How high can you raise the piers before RO/RO ships are unable to put the ramp down?*
  - This is an important operational issue that is identified in the HHMP, however a detailed, coordinated design solution will need to be developed through the SLR Strategic Committee. The Planning Team will review the HHMP to ensure that the issue of vessel and equipment operations interface with elevated pier design is highlighted in Chapter 7 – Development Plan.
  - The HHMP's broad response to SLR is to raise the piers; however, the plan also details more incremental strategies including monitoring real-time SLR over the years (1- or 5-year increments) to see where the projections match with reality. The need for pier modifications to match increases in SLR runs against the long lead-time required to securing financing, design, and develop/construct a project of this magnitude. It's a balance of how quickly you can start redeveloping harbor infrastructure to adapt to SLR and be more resilient while not disrupting

operations. There are incremental/intermediary solutions that can be implemented such as the design of the ramp or pier edge (e.g., removable bull rails, which are a Hawai'i innovation) The HHMP's approach to flexible design is to recommend concepts that will not preclude future designs or incremental adjustments.

- *There are existing tide gauges that have over 90 years of records. The tide gauge can be used to monitor future SLR.*

1. Specific Pier Improvements (Slide 26)
   a. Alternative to consolidate cruise operations to Piers 1 and 2 and eliminate cruise operations at Piers 10/11.
      i. This alternative was developed because ATDC was looking at redeveloping the area with a private developer; however, the developer decided not to move forward with the proposal.
      ii. The HHMP also includes the alternative to maintain the status quo of cruise operations at Piers 2 and 10/11.
   b. Piers 13 and 14 – Redevelop the piers through a PPP and long-term lease. The structure was identified as having high historic value, so the HHMP recommends maintaining the existing structure, if feasible. However, the building could be removed if that is determined to best serve the harbor's needs.
   c. Pier 19 – Interim use for the DOTH O'ahu District Baseyard. The baseyard would be relocated once the area is needed for cargo operations.
   d. Pier 37 – Replace the pier with a floating pier.

Discussion:

- *If cruise operations are consolidated at Piers 1 and 2, there will be safety issues with people walking along the berth nearby cargo operations with top picks and container trucks. In addition, there will be too many people at one cruise terminal, unless a really large passenger facility is constructed. It's better to separate the operations.*
- *It's not safe to have cruise ships at Pier 1 since they will be bunkering. In addition, cruise ships are getting larger and larger. This will create a hazardous situation for navigation, as well as the potential for oil spills. It won't be functional for cruise, cargo, or bunkering operations.*
- *Cruise operations should not be consolidated at Piers 1 and 2. We learned from Hilo Harbor that it's important to separate cruise and cargo operations. In addition, the move to consolidate cruise operations is driven by the future opportunity to develop Piers 10/11 for commercial uses, but there is a significant cost associated with giving up harbor land for non-maritime uses. DOTH may believe that they can generate higher revenue through lease grants versus maritime tariffs, but that is not the correct comparison because maritime activities have a multiplier effect here on O'ahu and the*

neighbor islands. Eliminating a second cruise terminal will impact the cruise schedule to Honolulu and neighbor islands.

- *Waterfront property is very limited, so to give up the Piers 10/11 berth for commercial development is a very bad decision as there is no more waterfront property.*
    - The HHMP's intention is to plan for, as well as retain flexibility for these alternative scenarios, especially considering that the landside of Piers 10/11 is under the jurisdiction of ATDC, which has a different mission and purpose than DOTH. Final decisions regarding the landside development of Piers 10/11 will be determined by ATDC, in consultation with DOTH. In addition, the HHMP is not a policy document and therefore is not the appropriate vehicle to include policy or commitments by DOTH. It is a planning document that provides recommendations for consideration by DOTH Administration and O'ahu District.
    - The HHMP includes alternatives to accommodate two cruise ships simultaneously. One of the alternatives is to retain cruise operations at Piers 10/11 and 2 and redevelop the landside through a PPP with the cruise industry or another private entity. If the cruise industry is interested in proposing a PPP for redeveloping Piers 10/11 for cruise operations, they can initiate discussions with DOTH to determine the level of commitment for both parties. The best venue for these discussions is outside of the HHMP planning process. The other alternative is to consolidate cruise operations at Piers 1 and 2. Pier 1 was a logical location as it is located adjacent to Pier 2 and the length of available berth would accommodate the large cruise ships. To address encroachment into the navigation channel, the HHMP recommends widening the main entrance channel by either extending into Sand Island or removing Pier 1 back to the fastland. Other unresolved logistical, navigational, safety, and bunkering issues are identified and highlighted in the HHMP for further discussion between the cruise industry and DOTH. These discussions should be continued outside of the HHMP planning process.
- *The HHMP should clearly state that while there are alternatives for cruise operations, the priority alternative is to retain cruise operations at Piers 10/11 and 2, especially considering there are no other uses for Piers 10/11 if cruise operations are relocated. In addition, the retention of Piers 10/11 for cruise operations does not impact Pier 1, which is a critical berth for cargo operations and access into Honolulu Harbor.*
- *Pier 1 is also important for emergency response, so to berth a cruise vessel at that location would be messy.*

  - The HHMP will include both alternatives; however, the Project Team will discuss how to reframe and prioritize the alternatives.
  - Pre-pandemic data indicates that cruise vessels berth at Piers 10/11 approximately 30 days per year. If cruise operations are relocated from Piers 10/11 to Pier 1, the potential impact to Pier 1 would be approximately 30 days per year.
- *The harbor entrance is used every day, so it's a significant impact to have a cruise vessel at Pier 1 for 30 days a year. Also, it's important that Pier 1 be retained for cargo long-term. Currently, Piers 10/11 work okay for interim vessels that don't have a full turnaround, so to make a large investment to redevelop Pier 1 for cruise vessels doesn't make sense if it will only be used 30 times per year.*
- *The State (DOTH and ATDC) should renegotiate the arrangement for Piers 10/11, so the waterside and landside are under DOTH jurisdiction. If there are no landside facilities to support the waterside vessels, then the berth is useless. In addition, if a vessel needs to make an emergency call to Honolulu Harbor, all available berthing is needed to accommodate and relocate vessels. ATDC should not be involved in any decision-making on the waterfront that impacts maritime activities.*
  - The waterside of Piers 10/11 is under DOTH's jurisdiction and is frequently used as a layberth for various vessels, e.g., Japanese trading ships, PSI's drydock, or other miscellaneous vessels. The maritime community is not at-risk of losing berthing at Piers 10/11.
  - The Piers 10/11 Cruise Terminal is under DOTH's jurisdiction and is opened approximately 30 times a year for cruise operations. Other times of the year, the building is closed.
  - When there is an emergency call to Honolulu Harbor, DOTH can shift vessels around to accommodate the emergency vessel.
- *The demand for cruise operations continues to grow, e.g., cruise operators are now hot-berthing, with one vessel arriving immediately after one departs. Also, cruise ships continue to grow larger. Currently, we can't accommodate all the cruise ships that would like to come to Honolulu Harbor because there aren't enough landside facilities to support them. This restricts the cruise industries' schedule for interisland and transpacific routes.*
  - It's a balance between the cruise industry committing to a high enough level of demand that justifies DOTH committing significant investment to develop additional support infrastructure for cruise operations. Both DOTH and the cruise industry need to sit down at the table to agree upon those mutual commitments. This discussion should be continued outside of the HHMP planning process.

1. Long-term Leases (Slide 27)

a. Long-term leases (30 year) for maritime support operators to incentivize private investment in maritime support facilities. This would not be extended to cargo operators.

2. Additional Recommendations (Slide 28)
   a. Regional drainage master plan –DOTH should participate in multi-jurisdictional discussions and planning, which presumably would be led by CCH.
   b. SLR Strategic Committee – DOTH led committee to address SLR within the harbor system.
   c. Land acquisition – The capacity analysis didn't support the need to acquire additional land area. However, the HHMP does identify land parcels that, if DOTH can acquire, will help with operations.
   d. Continued engagement with the Kānaka Maoli community – Engagement was started last year to establish relationships and build trust, so as issues come up during redevelopment, there are existing relationships and avenues for communication.
   e. Historic Preservation – Develop a programmatic agreement with the State Historic Preservation Division (SHPD) that identifies/streamlines the process for how to treat architectural and cultural resources located within Honolulu Harbor.

H. Discussion: Comments Received Prior to PAC meeting (presented by Jim Niermann, RMTC) Presentation Slides 31 – 34.

1. DOT Highways Division, Planning Branch
   a. Include recommendation for early interagency coordination, especially for any projects that may affect roadways.
   b. Enhance discussion of pedestrian improvements and wayfinding opportunities, particularly to/from Pier 2 Cruise Terminal.
2. CCH Office of Climate Change, Sustainability and Resilience
   a. Start response to SLR now.
   b. Include recommendation re: pumping to prevent rise in ground water table.
3. Iwilei District Participating Parties
   a. Various corrections to description of IDPP operations.
4. Young Brothers (YB) (Slide 32)
   a. Identify the "interisland cargo operator" as YB.
   b. Prioritize Piers 39 and 40 for improvements.
   c. Use Pier 41 for interisland cargo operations during Piers 39 and 40 reconstruction.

Discussion

- *While DOTH is conducting repairs at Piers 39 and 40, YB will need sufficient yard and berth space to accommodate their existing operations; otherwise their operations, that serve both Oʻahu and the neighbor islands, will be severely impacted. During repairs, YB would like to shift their operations over to Pier 41 since it is the closest to*

their existing operations. However, additional berthing and yard space (in addition to Pier 41) will be required, otherwise there will not be enough space to continue operations in a safe manner for the YB team and customers. There needs to be a plan in place to ensure YB's operations are not impacted by displacement or loss of operational space during repairs.

- *Once Pier 41 is completed, it will be 3 FT higher than Piers 39 and 40. So the transitions/ramping between the piers needs to be addressed to ensure cargo and truck ramps can operate safely between.*
- *If the Piers 39 and 40 slipway is filled-in, the lost berthing capacity needs to be replaced.*
  - The HHMP will include the recommendation that when harbor tenants/users are temporarily displaced due to reconstruction or repairs, there will need to be adequate accommodations for their operations.
  - The transitions between elevated pier aprons and yards to the adjacent roadways will be challenging. For example, raising the pier apron at Sand Island by approximately 3 FT, while maintaining a 0.5 percent slope, would require a 600 FT ramp. That leads to design challenges of how to design the ramp to minimize potential impacts to operations.
  - YB should continue discussions regarding relocation and adequate accommodations with DOTH Oʻahu District.

5. Cruise Lines Industry Association (Slide 33)
   a. Address Pier 1 deficiencies for cruise operations prior to implementing the consolidated cruise terminal alternative.
   b. Request statement of commitment to provide adequate berth and terminal facilities (berth and terminal) to support two cruise ships prior to eliminating cruise operations at Piers 10 and 11.
   c. Add reference to impacts to neighbor islands if cruise operations at Honolulu Harbor are reduced to a single terminal.
   d. Request for the HHMP to state a preference among the alternatives presented in the plan for the continued use of Pier 2 and Piers 10/11 for cruise operations, unless and until a suitable second terminal is developed.

H. Closing Comments / Discussion

- *On page 3-5, change "Kuloloio Station" to "Kuloloia Station."*
- *The flora and fauna description in Chapter 3 is written too generally and should include Hawaiian names for flora and fauna (e.g., honu, limu, etc.) to indicate that it is a harbor located in Honolulu.*
  - The Project Team will incorporate the suggested revisions into the HHMP.

- *Cybersecurity was not mentioned in the HHMP or planning process. It is a priority emerging threat that affects the security of the harbor. Was that intentional or oversight?*
  - It was not necessarily intentional; it was primarily due to the lack of expertise on the subject. We would appreciate help from those of you with cybersecurity expertise to help prepare language to include in the HHMP for future consideration by DOTH and operators.

I. HHMP Completion Process (presented by Jim Niermann, RMTC)

Presentation Slide 35.

1. PAC #4 Meeting – 11/3/2022; Any final comments from the PAC will be accepted until 11/4/2022
2. Finalize HHMP for DOTH Acceptance – 11/21/2022
3. Final review meeting with DOTH Administration and Director – 11/22/2022
4. DOTH Administration and Director accept the HHMP – 11/23/2022
5. Thanksgiving – 11/24/2022
6. Submit to Governor – 11/25/2022

End of Presentations

J. Officially adjourned (11:30 AM)

Honolulu Harbor 2050 Master Plan
Planning Advisory Committee 4

Contact Last Name	Contact First Name	Sub-TAC Group	Affiliation	Sign-in
Asasto	Nelisa	At-Large	Matson	J Zoom
Bogden	Jordan	Agency (U.S. Coast Guard)	U.S. Coast Guard	
Catalani	Roy	Cruise & Excursion Operations	Cruise Line International Association	PLC
Cook	Jim	Fishing Operations	POP Fishing and Marine	
Edwards	Ruby	Agency (State Office of Planning)	State Office of Planning	
Enos	Ed	Vessel Operations	Hawai'i Pilots Association	
Friel	Lek	At-Large	Matson	Zoom
Gemeno	Blaine	At-Large	Area Manager, Sause Bros.	
Gonser	Matt	Adaptation & Resiliency	City and County of Honolulu (CCH), Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management	
Grune	Randy	Cargo Operations	Hawai'i Stevedores	
Harter	Bob	Adaptation & Resiliency	City and County of Honolulu (CCH), Office of Climate Change, Sustainability and Resiliency/CCH Department of Emergency Management	
Hekekiah	Josh	Agency (State Office of Planning)	State Office of Planning	
Hong	Glenn	At-Large	Former Maritime Executive	
Johnson	Johanna	Adaptation & Resiliency	Federal Emergency Management Agency	
Kaanehe	Blue	Agency (DLNR)	Administrator, DLNR	
Kuloloio	Manuel	Non-Maritime Opportunities	Kuloloio Ohana	
Lu	Kim	Fishing Operations	VAK Fisheries, LLC/Boat Owner @ 16-18	
Martin	Chris	At-Large	Young Brothers	
Martin	Christy	Environment	Coordinating Group on Alien Pest Species	
Martin	Sean	Fishing Operations	POP Fishing and Marine	
Murata	Masatomo	Agency (DOT-STP)	DOT-STP	
North	Gary	At-Large	HHUG	
Oh	David	At-Large	Island Energy Services	
Olson III	Whit	Vessel Operations	FOSS Maritime	DO
Pillone	Peter	At-Large (DOTH)	Oahu District Manager, DOTH	
Polhemus	Dan	Environment	US Fish and Wildlife Service	
Rocheleau	Andrew	Maritime Support	Sea Engineering	
Rue	Harrison	Agency (CCH, DPP, TOD)	City and County of Honolulu, Department of Planning and Permitting, Transit-oriented development	
Schilling-Wheeler	Noelani	Cruise & Excursion Operations	Oahu Visitors Bureau	
Schmitz	Gerald	Agency (DOT-STP)	DOT-STP	
Sikkink	David	Agency (DBEDT-Foreign Trade Zone)	Administrator, DBEDT-Foreign Trade Zone	
Takekawa	Neil	At-Large (DOTH)	Harbors Administrator, DOTH	
Thomson	Wade	Agency (U.S. Coast Guard)	U.S. Coast Guard	
Tsuji	Russell	Agency (DLNR)	Administrator, DLNR	
Whalen	John	At-Large	Former Chair, HCDA	
Whitworth	Tiffanie	Maritime Support	Young Brothers	
Williams	Josh	Agency (U.S. Coast Guard)	U.S. Coast Guard	
Yocum	Janet	Adaptation & Resiliency	Federal Emergency Management Agency	
Zane	Jimmy	Cargo Operations	McCabe Hamilton & Renny Co.	
Maile	Earlynne	Maritime Support	Young Brothers	
MCLAREN	NUMBERS	USCG - C/SEC	USCG	
HULL	JESSICA	USCG - Districts	USCG	

Zoom Webinar Report

Topic	Honolulu Harbor Master Plan (HHMP) - Planning Advisory Committee (PAC) Meeting No. 4
Date / Time:	November 3, 2022 / 8:30 AM - 12:00 PM

Attendees

Lek Friel	PAC
Nelisa Asato (Nelissa Asato)	PAC
D Kekuna	TAC
Craig Furuta	TAC
Brittany Hopkins	TAC
Olivia Pham	TAC
Friends of Hōkūle’a & Hawai’iloa	TAC
Robb Tanaka	TAC
Matt	TAC
Michael MacDonald	TAC
Brand Marketing	TAC
Jadie Goo	TAC
Ali Wang	TAC
Alina Juliachs	TAC
Blaine Cacho	TAC
Victor Szabo	TAC
Curtis Chee	TAC
John jjuettner@healytibbitts.com	TAC
bgettelfinger	TAC
Jennifer Tomita# DOT Harbors	Agency
Pradip Pant# DOT	Agency
Josh Hekekia | OPSD-CZM	Agency

APPENDIX E

PUBLIC IMFORMATION MEETING (PIM)
NOTES

SUMMARY OF LIVE BROADCAST Q & A AND COMMENTS

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Date/Time:	Wednesday, August 4, 2021; 1:00 p.m. to 4:00 p.m.
Location:	Virtual Meeting via ʻŌlelo Broadcast and Zoom
Purpose	Public Information Meeting (PIM)
Host:	Hawaiʻi Department of Transportation, Harbors Division (DOT-H)

- Q&A in orange text indicates questions that were not responded to during the live broadcast.
- Notes in [bracketed blue text] indicate supplemental information not explicitly stated during the meeting or information that updates/clarifies responses given during the live broadcast.

The PIM utilized phones, Zoom chat, and the project email for participants to provide feedback during the live broadcast. Majority of questions were presented by the facilitator, Linda Colburn, and addressed on camera by project managers, Jim Niermann and Laura Mau. Other questions, comments, and responses not presented on camera were recorded through Zoom chat. All questions and comments related to the HHMP from participants and responses from the DOT-H Administration and Project Team are documented below. Questions are organized by subject category.

Planning Process

(1) Who are the participants on the Technical Advisory Committee (TAC) and Planning Advisory Committee (PAC)?

A: We had sector representation from the maritime industry, from county, state and federal agencies with responsibility over resources and operations in the harbor, and from adjacent landowners and others. The meeting records, including TAC and PAC participants list, are available on the project website.

(2) What subjects did the Sub-TAC Committees cover?

A: There were eight Sub-TAC Committees: Cargo Operations, Cruise and Passenger Operations, Maritime Support, Vessel Operations, Environment, Commercial Fishing Operations, Public Access Waterfront Development, and

Resiliency and Adaptation. More information is available on the project website.

(3) As a participant in the master plan process, how will my input be used?

A. All public comments received during the PIM and after the PIM up to August 31, 2021 will be documented in the master plan together with a response from the Project Team. The alternatives presented in the PIM have been developed through a lengthy, consultative, iterative process involving the maritime community, government agencies, DOT-H Administration and O'ahu District, the Aloha Tower Development Corporation (ATDC), and adjacent landowners; therefore, the alternatives as presented are generally what can be expected in the final master plan. However, input received through the PIM will be reviewed by the Project Team and used to continue to refine the alternatives or reference new information that was not previously considered. The public will have additional opportunities to provide input during the Environmental Impact Statement process for the master plan.

(4) What is the (US) Department of Transportation Act (DOT) 4(f) applicability to maritime projects?

A: [Projects that are funded by or that require USDOT approval are subject to 4(f) requirements to assess project impacts to historic sites, parks and recreational areas, and wildlife and waterfowl refuges. For DOT-H, 4(f) is typically only applicable for projects that receive USDOT grant funds.] In addition, the Sand Island Recreation Area (SRA) is subject to Land and Water Conservation Fund Act, Section 6 requirements and would require review by the Department of the Interior, National Parks Service and possible compensatory mitigation if SRA lands are acquired for harbor facilities.

(5) All road, bike, and pedestrian planning improvements must be coordinated with and through Oahu Metropolitan Planning Organization (O'ahuMPO) per 23 Code of Federal Regulations (CFR) 450 (23 U. S. Code [USC] 134).

A: The Project Team contacted the O'ahuMPO which recommended that DOT-H coordinate planned road, bicycle and pedestrian improvements with the Hawai'i Department of Transportation, Highways Division (DOT-HWY) Planning Branch. DOT-H is also encouraged to communicate directly with O'ahuMPO. O'ahuMPO would help coordinate all modes of transportation planning, including harbors, as part of its 3-C (continuous, cooperative, and comprehensive) process to "Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight," in conformance with 23 CFR 450.306(b)(6) . This is not linked to any funding requirement, but part of the ongoing long-range planning process.

O'ahuMPO does not have decision-making authority in this process. Their role would be to help ensure that DOT-H and ATDC improvements are aligned with DOT-HWY, and that DOT-HWY takes into consideration improvements proposed by DOT-H and ATDC. O'ahuMPO has monthly meetings with DOT-HWY and uses that venue for communication among O'ahuMPO, DOT-HWY and other project proponents, such as DOT-H.

Maritime – General, Cargo Capacity/Throughput Projections

(1) Second Harbor Entrance – How would the bridge(s) operate, and would it impact traffic to and from Sand Island?

A: The bridge concept in the master plan is to build a new bridge with a high enough air draft to accommodate tug and barge, fishing fleet and work boat traffic on a daily basis. The raised bridge concept to accommodate full-sized cargo vessels would be deployed only in the event of an emergency and would not be raised/opened during normal, day-to-day operations. A raised bridge would impede motor vehicle traffic on Sand Island Parkway for several hours while a vessel transits the channel, and so is not suitable for day-to-day operations.

(2) Consider the Federal Aviation Administration (FAA) height restrictions for airspace, U.S. Coast Guard (USCG) height clearance requirements, Federal Highway Administration (FHWA) bridge requirements, and cost for re-opening the second harbor entrance at the Kalihi Channel access. Sand Island Bridge on the harbor side is an inoperable bascule bridge and on the Ke'ehi side is a fixed pre-tensioned concrete span.

A: DOT-H is aware of the various restrictions that may affect the bridge modification concepts. The feasibility of the various bridge alternatives will be evaluated as part of the planned United States Army Corps of Engineers (USACE) feasibility study.

(3) How long will the USACE study take and how much will it cost?

A: The USACE study will take approximately 3 years to complete and cost $3 million dollars. The cost will be shared equally by DOT-H and USACE. DOT-H has secured the State's share of the funding for the study. USACE has not yet encumbered the federal funding portion.

(4) Has DOT-H worked with FHWA, Federal Motor Carrier Safety Administration (FMCSA), as well as DOT-HWY Planning and Motor Vehicle Safety on opportunities to leverage federal resources for landside planning and integrated

port/highways management of container handling at the cargo terminals and short-haul trucking / freight vehicle movement to and from the port?

A: The Project Team has not worked with the referenced agencies on leveraging federal resources for cargo handling and freight vehicle movement. However, the Project Team did meet with DOT-Highways, Highway Safety Section to discuss weigh station operations and future needs and technologies. DOT-H is open to partnership opportunities with DOT-HWY as part of its continuing efforts to increase efficiency and safety at Honolulu Harbor.

(5) Who pays for harbor improvements?

A: Typically, the piers, decks, yards, lights and basic infrastructure are paid for by the DOT-H. All other above-ground structures and equipment (buildings, cranes and related power supply, gates) are typically paid for by the terminal operator. Some features are negotiated between the State and the terminal operator.

The public's tax dollars are not used to pay for harbor improvements. Instead, either DOT-H's cash or bond sales are used to fund capital improvement program (CIP) projects. Revenue to support financing comes from the DOT-H's Special Fund, which originates from tariffs (i.e., wharfage, dockage, port entry fees, mooring charges, demurrage, cleaning and other harbor fees) and lease revenues. Tariffs and leases are the largest sources of revenue.

Ultimately, all consumers pay for harbor improvements through shipping costs passed on in prices of consumer goods that are relied on for our economic well-being and quality of life. For this reason, it's important to pro-actively plan for harbor improvements and modernization that will ensure that the harbor operates reliably, efficiently and productively.

(6) Why are there only two areas of the harbor that are accessible to the public?

A: Most of the harbor area is dedicated to industrial maritime use which is subject to federal and state security requirements and access controls and not appropriate for general public access due to health and safety interests. These security provisions are a post-9/11 condition. [Due to the critical function of these industrial maritime operations to public welfare and the economy, these areas are gated and accessible only to individuals with Maritime Security Awareness (MSA) training and a Transportation Worker Identification Credential, also known as TWIC®, required by the Maritime Transportation Security Act.]

(7) How are the capacity projections affected by the COVID-19 pandemic?

A: The 2050 cargo volume projections and related capacity analyses are not affected by the COVID-19 pandemic. The projections are based on historical data, including from periods that experienced economic recessions and impacts from natural and man-made disasters, and include a maximum and minimum range of projections to capture the averages over time. The Project Team is confident in the accuracy of the projections.

Maritime – Pier-by-Pier

(1) The Pier 19 building and adjacent improvements were constructed under a FHWA Ferry Program discretionary grant. The DOT-H and DOT-HWY may have to coordinate with FHWA to demolish or get permission to adapt the Pier 19 building for other transportation uses.

A: The Inter-Island Terminal building at Pier 19 was constructed for $6.1 million in 2003 funded by the FHWA Ferry Program. DOT-H negotiated with FHWA and purchased the Inter-Island Ferry Terminal Building and has full control of its current and future use.

(2) Does Pier 21 already have sheet piles?

A: Pier 21 is a combination of pile-supported wharf along some segments of the pier, and bulkhead wharf with anchored steel sheet piles and pre-cast concrete in-fill panels along other segments. In both the bulkhead and post/deck construction, the pier and bulkhead foundations below the water surface are subject to scouring from the water thrust from tug vessel operations and the overall pier needs strengthening. The recommendation is to reconstruct the entire pier with bulkhead, sheet pile construction for resiliency against day-to-day vessel operations and natural or man-made disasters.

(3) Would cutting back Pier 23 allow a vessel to remain at Pier 23 when Pacific Shipyards International (PSI) shifts their drydock to dock/undock vessel?

A: Yes, cutting back the pier face would create more maneuvering area within the slipway and would make the pier more usable by smaller vessels during PSI dry dock operations. However, vessel operations at Pier 23 would still need to be coordinated with PSI's operations at Piers 24 and 25. The proposed Pier 23 improvements also involve clearing out the subsurface rocks and debris to improve navigation and berthing at the pier face and strengthening the pier to make it more resilient against undermining from vessel operations and against natural and manmade disasters.

(4) Is the grain elevator at Pier 23 still in operation?

A: The grain elevator system and storage silos at Pier 23 are not operational. The former Pier 23 grain operations (formerly Pendleton Flour Mills (PFM) / Hawaiian Flour Mills (HFM) terminated their bulk grain receiving, processing and distribution operations in 2014, and was the last flour mill in the state. The twenty 160-ft grain silos and corrugated steel buildings have been idle since 2014 after continuous operation for over 55 years.

Portions of the original structures, including the grain elevator, have been dismantled. The remaining structures occupy valuable harbor yard space adjacent to Pier 23 that would be better utilized by a maritime operator.

(5) Cruise Lines International Association (CLIA) is pleased to see that slide 85 ("Cruise Terminal Alternatives") list "shared-use cruise operations/retail/commercial use at Piers 10 and 11 and continued use of Pier 2 as a primary cruise terminal" as the first alternative. Can we interpret this to mean that alternative number one is the preferred alternative? Of the alternatives listed, this is clearly the alternative that best meets the public interest and the interests of cruise operators, cargo operators, and other harbor users.

Would Piers 10 and 11 be used only for lay berthing of cruise ships?

A: The master plan is not a decision-making document; it is a set of alternatives for consideration by the State. The Piers 10 and 11 alternatives are presented in the draft master plan without preference. The intention is to maintain flexibility in the plan for various future scenarios. The master plan will present the operational constraints and opportunities under each alternative, as well as the jurisdictional authority for land-use and policy decision-making. Decisions on the use of these piers will be based the outcome of continued discussions among the cruise industry, DOT-H and ATDC.

Under the alternative where the Piers 10 and 11 shed is converted to commercial / retail use only and cruise operations are relocated to Piers 1 and 2, the Piers 10 and 11 pier and apron would still serve a maritime function and could continue to be used for lay berthing a cruise ship or other vessel.

(6) If the State selects "Cruise Terminal Alternative" number two, will the State commit to not eliminating cruise operations from Piers 10 and 11 until there is a second berth and suitable land capacity to serve a second cruise ship at Piers 1 and 2?

A: If cruise operations are eliminated from Piers 10 and 11, DOT-H will work with the cruise industry to coordinate the transition to consolidated cruise operations at Piers 1 and 2. The timing of the elimination of cruise operations

at Piers 10 and 11 and the type of replacement facilities provided at Piers 1 and 2 is a policy and operational decision and is beyond the scope of the master plan. What the master plan can do is identify land area, berthing and facility requirements, and constraints associated with consolidated cruise operations at Piers 1 and 2.

The Project Team understands that in the short-term, temporary / mobile facilities and scheduling arrangements that DOT-H deems acceptable for cruise operations at Pier 1 might not be preferred by the cruise operators and could deter calls at Honolulu Harbor by some cruise vessels. However, more permanent facility improvements at Piers 1 and 2, including a new terminal building, major renovation of the existing terminal building to accommodate operations for two cruise vessels, and/or channel widening, would take a longer time to develop and will require commitments from all parties to determine supportable levels of investment.

(7) If the State will not commit to retaining cruise operations at Piers 10 and 11 until there is a suitable second berth and facility for cruise ships at Piers 1 and 2, then what does the planning group conclude about the 29 days in 2019 on which there were two cruise ships in Honolulu Harbor (reference to slides 86 and 87 [“Pier 1 – Combined Cruise and Cargo Operations”])?

- Does the planning group believe that these 29 days can be managed by rescheduling calls at Honolulu Harbor in combination with rescheduling call dates at neighbor island ports?
- Does the planning group believe that the economic impact of these calls upon Honolulu and the associated multi-island neighbor island port calls are not significant or less than the economic impact of a retail/commercial use at Piers 10 and 11?
- Is the planning group using these 29 days (from 2019 cruise ship port calls) to forecast the number of port calls for the planning period of the master plan?

If the answer to any question above is "yes", where can we find the analysis?

A: What the Project Team concluded from the 29 days is that if cruise operations are eliminated from Piers 10 and 11, then DOT-H will need to find another berth in the harbor to accommodate those 29 days of cruise vessel calls. DOT-H would first look to the existing cruise terminal at Pier 2 to accommodate additional calls, then to Pier 1 if there are two cruise vessels schedule to be in port on the same day.

Under this scenario, DOT-H would look at one of the tiers of facilities previously discussed, from temporary/mobile facilities to permanent facilities. The more permanent the facility and the more investment that’s involved, the longer it will take to develop that facility. New facilities at Piers 1 and 2 would

have to be developed with careful coordination between DOT-H and the cruise industry to discuss levels of investment and mutual commitments, such as the number and type of cruise vessel calls that would be made at the harbor to balance the investment.

The Planning Team does not consider the 29 calls to be insignificant. The Planning team recognizes that the 29 days represent tremendous economic activity and benefit to the State. The master plan will include alternatives to accommodate continued operations at Piers 10 and 11, and to relocate all cruise operations to Piers 1 and 2 and improve Pier 1 facilities in increments over time to create a viable, second cruise berth.

The Project Team is not using the 29 days to project future cruise industry demand out to 2050. Based on consultation with cruise industry representatives during the planning process, the Planning Team anticipated continued cruise industry growth in Honolulu over the planning period. The COVID-19 pandemic has had a significant impact on that trajectory with short-term reductions and stoppage of cruise ship calls in Hawai‘i. It is possible that the industry will rebound more strongly than the pre-pandemic assumptions if the market demand shifts to favor domestic over international cruising. DOT-H will continue discussions with the cruise industry and the outcome of those discussions will determine where and what type of cruise facilities are developed in Honolulu Harbor. Again, the master plan alternatives are designed to accommodate various potential outcomes of those discussions.

Waterfront Development / Aloha Tower Area / Irwin Park

(1) What is the relationship between DOT-H and ATDC?

A: ATDC is established as a quasi-government development authority by HRS §206J. ATDC leases the Aloha Tower land area (generally from Piers 5 to 11) from DOT-H for the purpose of:

> *undertaking the redevelopment of the Aloha Tower complex to strengthen the international economic base of the community in trade activities, to enhance the beautification of the waterfront, and in conjunction with the department of transportation, to better serve modern maritime uses, and to provide for public access and use of the waterfront property. Properly developed, the Aloha Tower complex will further serve as a stimulant to the commercial activities of the downtown business community and help transform the waterfront into a "people place. (HRS §206J-1)*

[Development projects in the areas under ATDC control are undertaken through a planning and approval process separate from DOT-H’s commercial port operations and facility improvements planning process.

ATDC evaluates development alternatives and makes decisions to achieve the highest and best use of the landside areas under their jurisdiction. While modern maritime uses are a consideration in ATDC's mandate, they do not have the same priority as in DOT-H's mission statement. The DOT-H maintains jurisdiction over the piers and aprons within the Aloha Tower area for maritime uses.]

(2) Comment on the renderings: View angles to the open profile bridge slide are from a viewpoint 250 feet + in height. A better visual representation can be achieved by showing the view angle from no higher than the 3rd-story elevation, which offers a better visual impact analysis in dense urban areas into and out from the site.

A: The Project Team will take this into consideration.

Project Prioritization

(1) How is DOT-H prioritizing and setting timelines for these improvement projects?

A: DOT-H Administration, working with O'ahu District operations personnel, determines project priorities. They conduct an annual review of projects and based on year-to-year conditions in the harbor and with respect to budgets, they evaluate and adjust priorities and make decisions on which projects to advance.

[Criteria used in DOT-H's prioritization process are based on the following:

- Public safety
- Existing systems preservation
- State and Federal compliance
- Major replacements
- Revenue enhancements
- Energy efficiency
- Functional improvements and system modernizations
- Capacity expansion and congestion mitigation

The master plan will include discussion of additional criteria for consideration by DOT-H Administration and the O'ahu District when reviewing project priorities for funding. These include:

- Logical sequence
- Conditions assessment / end of asset life cycle
- Synergy with other project(s)

- Public Private Partnership (PPP) opportunities
- Affordability – including the State's ability to obtain funds for a project through Federal Grants or selling bonds.
- Climate change and sea level rise adaptation and resiliency]

(2) What is the phase-in process?

A: DOT-H has various harbor improvement projects underway at any given time. Major harbor improvement projects currently underway include construction of the Kapālama Container Terminal. The second harbor entrance alternatives will be evaluated as part of a feasibility study that will be jointly funded by DOT-H and the USACE and prepared by the USACE. Given the long time-frame required for planning, financing, design, regulatory clearances and construction, the second harbor entrance would likely take several decades if it were to be approved for development.

(3) Who will make the final determination on when projects are funded and implemented?

A: The DOT-H Administration makes the final decision on when projects are funded and implemented.

Resiliency / Adaptation

(1) What is DOT-H response to the lessons learned from the auto-carrier incident in Port of Brunswick (St. Simons, GA) and the MV Golden Ray?

A: DOT-H is aware of and studying the MV Golden Ray incident to apply lessons learned to vessel carrier operations in Honolulu Harbor. In September 2019, the outbound 656-ft carrier MV Golden Ray with 4,200 autos capsized at St. Simons Sound on her departure from Port of Brunswick, Georgia. The vessel was entering a starboard turn through the shipping channel in an unstable condition, listing heavily before rolling back and toppling on its port side. Human error and vessel instability contributed to this incident, further compounded by having an open side port which allowed water to flood into the vessel's compartments. Salvage operations to dispose the vessel in-place are nearing 2-years in duration.

Through Zoom chat, Captain Ed Enos of the Hawai'i Pilots Association, noted that maritime users have been handling ships like the MV Golden Ray at Honolulu Harbor for many years and continue to do so today. The "next generation" car carriers are the same length as previous auto carrier vessels, but higher and wider. This is just one factor that requires a wider Kapālama transit channel and main ship channel.

(2) What about the relationship of the HHMP to the USCG Marine Transportation System (MTS) and other disaster preparedness and response efforts?

A: The master plan fundamentally is a land use plan, not a disaster response or security plan. However, the master plan does consider port security and resilience and will present land use alternatives and facility improvements to support port adaptation to climate change and sea level rise, and to strengthen resiliency against natural and man-made disasters. The master plan will also identify areas within the harbor for disaster response activities.

Regarding security and disaster planning, outside of the master planning scope there is continuous work from the USCG, U.S. Navy, and the Department of Defense to provide safety and assist in the event of disasters. The USCG develops and maintains the Marine Transportation System Recovery Plan (MTSRP) which addresses all hazards and marine transportation system recovery processes and procedures for commercial ports. The USCG also established the Hawaii Marine Transportation Systems Recovery Unit (MTSRU) to work with stakeholders and identify recovery priorities for the incident commander and decision-makers. These efforts are undertaken in coordination with the State DOT through the State Department of Defense and the Hawai‘i Emergency Management Agency.

SUMMARY OF POST-PIM QUESTIONS, COMMENTS AND RESPONSES

Project:	*Honolulu Harbor 2050 Master Plan* (HHMP)
Comment Period:	August 4, 2021 to August 31, 2021
Purpose:	Post-Public Information Meeting (PIM) Comments and Responses
Host:	Hawai'i Department of Transportation, Harbors Division (DOT-H)

Questions and comments on the PIM presentation that were received after the live broadcast up to the August 31, 2021 comment deadline are presented below along with the Project Team's responses.

The Friends of Hōkūle'a and Hawai'iloa

The Friends of Hōkūle'a & Hawai'iloa, (FHH), is a non-profit organization founded 25 years ago dedicated "…to perpetuate and teach the Hawaiian traditions of building, restoring, and caring of canoes". The volunteers and the beneficiaries would readily attest that the Friends has served to sustain and enhance the maritime traditions, education, and quality of life for the people of Hawai'i this last quarter of a century."

FHH currently occupies space at Pier 60 where they have been able to complete many canoe projects for cultural display, racing, and voyaging. They also share space at the Men's Shed, located at the Pier 19-20 area.

The Friends is encouraged that this master plan recognizes Honolulu Harbor's cultural and quality of life values, e.g., Aloha Tower Area design guidelines described from Slide Nos. 102-105. We advocate that such general value recognition and development guidance be not limited to a single project but to all projects.

Keeping to the spirit of HRS 200-12.5 and 200-20 applicable to the State small boat harbors; the less-busier piers and portions of the Honolulu Harbor especially hold flexible possibilities for multi-use during different seasons of the year, days of the week, time of the day, emergencies, or special events.

A: DOT-H appreciates the information about the FHH and acknowledges FHH's recommendation to recognize and incorporate the cultural and quality of life values in all projects within the harbor.

On July 8, 9 and 10, 2021, DOT-H conducted early cultural engagement meetings with native Hawaiian families and cultural practitioners who have kuleana within the three ahupua'a of Honolulu, Kalihi, and Kapālama. As the planning phase of this project transitions into the environmental review phase

(under Hawai'i Revised Statutes, Chapter 343), DOT-H will continue to engage with families and practitioners, including FHH, on this important topic.

Regarding to the comment about keeping to the spirit of HRS 200-12.5 (Native Hawaiian canoes; education) and HRS 200-20 (Hawaiian outrigger canoes on state shoreline areas), Honolulu Harbor is first and foremost an industrial harbor, but the HHMP endeavors to acknowledge its rich history, and proposes where feasible, possible resurrection and inclusion of past uses. One of the goals of the master plan is to reconnect the public to the waterfront and access to its resources, where it makes sense and is safe to do so.

Cruise Lines International Association (CLIA):

Regarding Slide 85 ("Cruise Terminal Alternatives"), CLIA was very pleased to see that slide 85 lists "shared-use cruise operations/retail/commercial use at Piers 10/11 and continued use of Pier 2 as a primary cruise terminal" as the first alternative. CLIA was disappointed to learn, however, from the Master Plan presentation, that this does not mean that alternative no. 1 is the preferred alternative. Instead, they understand that this is just one alternative being presented to the State. Of the alternatives listed, it is our position that this alternative is clearly the best alternative in terms of meeting the public interest and the interests of cruise operators, cargo operators, and other harbor users in the management and allocation of limited harbor resources. CLIA respectfully submits that the draft Master Plan should provide a discussion and analysis of the issue of what alternative best meets the public interest and the interests of cruise operators, cargo operators, and other harbor users, particularly because one of the alternatives proposes the displacement of existing and significant harbor users (cruise ship operators) in favor of a non-maritime use (retail/commercial use).

A: The master plan is not a decision-making document; it is a set of alternatives for consideration by the State. The Piers 10 and 11 alternatives are presented without preference. The intention is to maintain flexibility in the plan for various future scenarios. The master plan will present the operational constraints and opportunities under each alternative, as well as the jurisdictional authority for land-use and policy decision-making. The ultimate use of Piers 10 and 11 will be determined by DOT-H and the Aloha Tower Development Corporation (ATDC) based on the best interest of the State and public. Engagement among DOT-H, ATDC, the cruise industry and interested private developers is a necessary part of the decision-making process.

It is important to recognize that the ATDC was given jurisdiction over land use decisions at Aloha Tower by the Hawaii Legislature for the purpose of "redevelopment of the Aloha Tower complex to strengthen the international economic base of the community in trade activities, to enhance the beautification of the waterfront, and in conjunction with the department of transportation, to better serve modern maritime uses, and to provide for public

access and use of the waterfront property". While modern maritime uses are a consideration in ATDC's mandate, they do not have the same priority as in DOT-H's mission statement. The ATDC must look at development alternatives that make the highest and best use of the landside areas, potentially to the exclusion of cruise operations at Piers 10 and 11, which make only part-time use of the facilities. Expanding retail and commercial development at Aloha Tower is one foundational component of an approach to revitalize economic activity in the area, strengthen mauka-makai and Downtown connections, and reengage Hawai'i's residents with the Aloha Tower area. It is possible that this outcome can also be achieved with integrated retail/commercial and cruise terminal operations at Piers 10 and 11. Under the alternative where the Piers 10 and 11 shed is converted to commercial / retail use only and cruise operations are relocated to Piers 1 and 2, Piers 10 and 11 waterside could still serve a maritime function and be used as lay berth for cruise ships or other vessels. The master plan is flexible and includes alternatives to accommodate each of these scenarios.

For further consideration, in discussions and surveys with cruise industry representatives and the maritime community, Piers 10 and 11 were identified as being extremely constrained for cruise operations, including ground transportation, passenger processing and cruise vessel provisioning / servicing. Spatial constraints might be further exacerbated by post-COVID requirements for passenger screening and social-distancing. To accommodate cruise operations and future passenger growth more efficiently, developing consolidated terminal facilities at Piers 1 and 2 might prove to be the most suitable alternative.

Regarding potential impacts to cargo operations at Pier 1, an analysis conducted by the Project Team determined that with the opening of Kapālama Container Terminal in 2024, Honolulu Harbor has sufficient capacity to handle projected 2050 cargo throughput with relatively minor densification at the dedicated cargo terminals. The general use cargo piers, including Piers 1 and 2, Piers 19 and 20, Pier 29 and Piers 31 to 33, provide additional cargo capacity beyond the projected 2050 throughput, as well as flexibility for vessel assignments that will allow O'ahu District to operate the harbor most efficiently. This might include seasonally shifting some cargo vessel operations from Pier 1 to the other general use piers to accommodate cruise vessels at Piers 1 and 2.

CLIA posed the question that, if the State instead selects "Cruise Terminal Alternative" no. 2 (i.e., eliminating cruise operations from Piers 10/11), will the State commit to not eliminating cruise operations from Piers 10/11 unless and until there is a second cruise berth with suitable land capacity to serve a second cruise ship at Piers 1 and 2? CLIA understands, from the Master Plan presentation, that the answer to this question is "no", i.e., the State will not make such a commitment.

A: If DOT-H decides to eliminate cruise operations from Piers 10 and 11, the DOT-H will work with the cruise industry to coordinate the transition to consolidated cruise operations at Piers 1 and 2 with appropriate facilities, which could be temporary, semi-permanent, or permanent structures as indicated in the presentation. The master plan will identify land area, berthing and facility requirements and constraints. The timing of the elimination of cruise operations at Piers 10 and 11 and the type of replacement facilities provided is a policy and operational decision and is beyond the scope of the master plan.

Regarding Slide 86 and 87 ("Pier 1 – Combined Cruise and Cargo Operations"), assuming that the answer to the previous question is "no" (i.e., CLIA assumes that the State will not commit to providing a second cruise berth with suitable land capacity to serve a second cruise ship at Piers 1 and 2 prior to eliminating cruise operations from Piers 10/11) then, in connection with slides 85-86, what does the State or the planning group conclude about the cited 29 days in 2019 on which there were two cruise ships in Honolulu Harbor? For example,

(a) Does the State or the planning group believe that these 29 days can be managed by rescheduling calls at Honolulu Harbor in combination with rescheduling call dates at neighbor island ports?
(b) Does the State or the planning group believe that the economic impact of these calls upon Honolulu and the associated multi-island port calls are (i) not significant or (ii) less than the economic impact of a retail/commercial use at Piers 10/11?
(c) Is the State or the planning group using these 29 days (from 2019 cruise ship port calls) to forecast the number of port calls for the planning period of the Master Plan or some other time period?

A: Understanding that a cruise ship and fuel barge berthed at Pier 1 would create a navigational constraint in the harbor entrance channel and prohibit large vessels (i.e., typical cargo vessels and auto carriers) from entering or exiting the harbor during the estimated 8 hours that fuel barge operations typically take to discharge, the Planning Team, with input from Oʻahu District, concluded that the use of Pier 1 as a cruise vessel berth is only feasible through vessel scheduling unless and until the harbor entrance channel is widened. Oʻahu District and the cruise operators might also coordinate port call scheduling to increase utilization of the Pier 2 berth during the cruise season.

The Planning Team used the 2019 port call data identifying 29 days in which there were two cruise vessels in port to assess potential impacts on Pier 1 utilization and cargo operations should Pier 1 be used as a second cruise vessel berth. The Planning Team did not use the 29 days as the basis to forecast the number of cruise vessel port calls for the master plan planning period or to analyze economic impacts of the cruise industry.

The Planning Team prepared cruise passenger projections to understand potential future cruise vessel activity and facility needs in Honolulu Harbor.

The projections are based on historic Hawai'i Tourism Authority cruise passenger data and Department of Business, Economic Development and Tourism 2045 projections for international passengers extended out to 2050. The baseline projection indicates an increase in cruise passenger activity (combined incoming and outgoing) from 490,000 passenger movements in 2018 to 528,000 passenger movements in 2050, understanding that developments and trends in the cruise industry may affect the projection. The Planning Team believes that a second cruise vessel berth is necessary to accommodate the number of pre-pandemic cruise vessel calls at Honolulu Harbor and the projected growth in cruise industry activity at Honolulu Harbor.

CLIA posits that an objective analysis will conclude that the answer to question (a) above is "no"; that is, limited neighbor island port capacity precludes these 29 days being managed (or the impact of losing Piers 10/11 being mitigated) by rescheduling calls at Honolulu Harbor in combination with rescheduling call dates at neighbor island ports. CLIA further posits that the economic impact of these calls upon Honolulu and the associated multi-island port calls are undisputedly very significant and are greater than the economic impact of a retail/commercial use at Piers 10/11.

A: We understand and appreciate CLIA's advocacy for the economic benefits of cruise industry operations in Hawai'i. The master plan recommendations are developed to accommodate continued cruise operations in Honolulu Harbor under various scenarios. The master plan will include an evaluation of the facility and operational requirements and constraints of the alternatives. However, as noted above, the master plan is not a decision-making document. Decisions regarding the use of Piers 10 and 11 will be made by DOT-H based on State policy and O'ahu District operational considerations and by ATDC based on their mandate.

Lastly, CLIA understands, from the response to their question during the PIM, that the Master Plan does not use the referenced 29 days (from 2019 cruise ship port calls) to forecast the number of port calls for the planning period of the Master Plan, although the presentation does not expressly make that statement. CLIA believes that the Master Plan should explain the relevance of the reference to these 29 days to necessary decision-making between alternatives.

A: As previously noted, the 29 days is not used to forecast the number of future port calls during the planning period. The Master Plan will include discussion of how the 29 days is used as the basis for developing cruise operation alternatives, as well as how the port data is used to assess potential impacts on Pier 1 utilization and cargo operations should Pier 1 be used as a second cruise vessel berth.

Regarding questions (a), (b) and (c), where can the State's analysis on these three (or similar) points be reviewed? If these (or similar) analyses do not exist, it would appear that there is a lack of a planning foundation for the necessary examination of "Cruise Terminal Alternative" no. 2. Equally important, the master plan needs to develop, cite and present such data and analysis as a basis for the State or the planning group to (a)

actually recommend “Cruise Terminal Alternative” no. 2 (and the associated displacement of cruise ships) as a well-considered alternative and (b) make express conclusions about the impact or potential impact of “Cruise Terminal Alternative” no. 2. on cruise operators and other harbor users, including cargo operators, particularly in the context of the Master Plan’s related proposal relating to modifications to Pier 1 (being an important cargo operations facility).

A: As noted in the responses above, ultimately, use of Piers 10 and 11 will be determined by DOT-H and the ATDC based on the best interest of the State and public. The master plan will include an evaluation of cruise terminal facility and operational opportunities and constraints at Piers 1 and 2 and Piers 10 and 11 and alternatives to accommodate the potential development outcomes of negotiations among DOT-H, ATDC, the cruise industry and interested developers. It is beyond the scope of the master plan to conduct comparative economic analysis of different redevelopment scenarios. Engagement among the interested parties is a necessary part of the decision-making process to establish a basis for mutual commitments on port facility operations, cruise schedules and investments. Ultimately, DOT-H will make decisions about harbor improvements based on State policy, operational requirements and public-private partnerships that will best serve the people of Hawai‘i and the maritime community.

Healy Tibbitts Builders, Inc. (HTBI)

HTBI is encouraged to see the goal to “create opportunities for maritime tenants through long-term lease agreements, public private partnerships and capital advancement program funding” included in the 2050 Master Plan.

A: DOT-H greatly appreciates HTBI’s support for the master plan and the concept of incentivizing capital investment in port facilities through long-term leases and public-private partnerships. The Project Team heard from an array of maritime users about the need for longer-term tenure as a pre-requisite for obtaining private financing for capital improvements in the harbor. We agree that this is an effective tool for encouraging investments in harbor improvements and contributing to the stability of harbor modernization efforts.

Mr. Gordon Piianaia

Mr. Piianaia is a descendant of Keliimaikai whose residence is shown on a "Honolulu In 1810" map on the beach at the bottom of Nu‘uanu Street. His family (on both his mother’s and father’s sides) has had a history with the Honolulu Harbor area in addition to Keliimaikai's residence.

Very well done and a very informative presentation. It sure brought back memories of growing up/working along the harbor - on both sides of Nimitz. Also took me back to the 80s when efforts were made to bring some life to the Aloha Tower area and Restaurant

Row - a Fisherman's Wharf or another Ports of Call or maybe even a Pike's Market. Amazing how the Pier 38-40 area blossomed. Anyway, some quick comments from an outsider who stumbled upon your presentation. On the "Honolulu In 1810" map, there is the residence of Keliimaikai at the shoreline next to Nu‘uanu Street. We know who he was. I am a direct descendant and was given his name, one of 4 males in our lineage who are honored with his name. On the ‘ewa side of Nu‘uanu Stream along Nimitz, my mother's older brother owned the A‘ala Meat Market, part of the Oahu Market complex no longer there. Those days refrigerators were a luxury item, spending time at the market and in Chinatown was part of growing up. Chinatown sure has its challenges today. Coming from a bunch of mariners around us younger kids while growing up, it was only natural that Honolulu Harbor would become a part of our lives. Examples: My dad was a detective at the old Bethel Street station. He also was with the PUC when it was located topside at Pier 8-9? He was also captain of the Fish-Game boat Makua which was berthed at the harbor. Uncle Al Bader was the captain on the fireboat tied up in Honolulu Harbor. It was the best ride in town for us kids and we thought he owned the darn boat. Uncle Snow (Captain Danny Keao) was master on the Hawaiian Princess, later renamed the Mauna Kea. Darn, us kids thought he owned it. Three of us in our family were USCG licensed ship's Unlimited Masters. I attended the California Maritime Academy and my younger brother attended King's Point. My dad was the other ship's Master. All of us worked ships for Inter-Island Steam, MSTS (Military Sea Transportation Service) - later MSC, and Matson. My brother retired as Master of the Matsonia. Enuf! While in grad school (1967-69), I was 1 of 3 Kalihi Bascule Bridge operators for DOT. Traffic was not that heavy back then and I do not think traffic was stopped for more than 45 minutes, if even that long. The bridge was a smooth and quick operation. I guess we all know what will happen if the main entrance is blocked...especially by one of the huge cruise vessels at Pier 1/2. I was with the Naval Control of Shipping on Ford Island, and I always wondered what history would be like if the Japanese had also blocked the entrance to Pearl Harbor. Back in the 80s I joined a couple of good buddies at Pier 7 - Tommy Holmes and Captain David Lyman. There was no structure there - nothing. Tommy asked us to visualize a new Kalakaua Boathouse (Healani) at Pier 6/7, the site of the original Kalakaua Boathouse. The seed was planted and in 1988 the Hawaii Maritime Center (HMC) became an educational site where the maritime history of Hawaii could be shared with all. To us mariners, well some of us, Hawaii's history is a maritime history and HMC was a great place. It was managed/operated by the Bishop Museum, and they did a great job. However, HMC also became a financial albatross and when it closed in 2009, many of us felt like the Falls of Clyde - abandoned. Great exhibits, great artworks, and greater dedicated staff. The voyaging canoe Hokulea was berthed at Pier 7 - for most of time it was also owned by the Bishop Museum and that is another story. METC on Sand Island is a great home for the canoe today. [Tommy, David and I sailed on Hokulea in 1976, the maiden voyage. I would serve as captain for 19 years.] Boat Day (arrival) will always be a day of managing traffic - vehicular and people. Departure is not as hectic. I have been on a number of cruise vessels and the scenario is the same - San Francisco, LA, Florida, Europe, Tahiti, Cook Islands, Sydney. The congestion upon arrival... Roundabout? Hmmm - go visit Tahiti (waterfront area) and Rarotonga. Too many big vehicles for that

intersection, I think. I think traffic lights have better control than a roundabout. Did not hear anything about an inter-island ferry system for the only island state in the nation. Maybe after the rail is completed. Again...wonderful presentation and another challenge to make sure Honolulu Harbor continues as the "heartbeat" of Hawaii.

A: DOT-H appreciates Mr. Piianaia's personal remembrances and mana'o as a lineal descendant of Keliimaikai, as well as his professional history. The HHMP recognizes and seeks to honor the harbor's multi-faceted, pre- and post-contact history. On July 8, 9 and 10, 2021, DOT-H conducted early cultural engagement meetings with native Hawaiian families and cultural practitioners who have kuleana within the three ahupua'a of Honolulu, Kalihi, and Kapālama. As the planning phase of the project transitions into the environmental review phase (under Hawai'i Revised Statutes, Chapter 343), DOT-H will continue to engage with families and practitioners on this important topic.

Regarding the use of roundabouts, this measure was recommended by the Project Team's traffic engineer to control congestion in and around the Aloha Tower area, particularly along Ala Moana Boulevard. The recommended 100- and 120-foot diameters for the two roundabouts at Bishop and Richards Streets, respectively, can accommodate multi-modal transportation, including buses and large delivery trucks. However, as the Project Team proceeds with refining the concept and conducting the HRS 343 environmental review, we will revisit these and other recommended measures to determine their appropriateness in mitigating traffic impacts.

Hawaiian Electric Company (HECO)

HECO suggests that 2050 plan include planning and accommodation for port electrification, and reduction of port related emissions. This is in line with the Federal Bi-partisan Senate infrastructure agreement which includes:

- *Section 11115. Congestion Mitigation and Air Quality (CMAQ) Improvement Program. CMAQ funding is used to reduce congestion and improve air quality, particularly in regions that do not meet national air quality standards. This section expands the list of eligible projects under CMAQ to include the purchase of medium- and heavy-duty vehicles and related charging infrastructure. The section also prioritizes investments in minority- and low-income populations and reducing port-related emissions.*
- *Section 11402. Reduction of Truck Emissions at Port Facilities. Authorizes reducing emissions at ports – including port electrification projects.*

A: The master plan includes recommendations to provide shore-side power for specific piers to accommodate "cold-ironing" of berthed vessels and thereby reduce related emissions from idling ship engines. In addition, the master plan provides recommendations for reducing traffic congestion and related

emissions by providing additional vehicle storage/queuing lanes to accommodate container vehicles within the pier yards and reduce traffic on public roads. DOT-H will continue to consult with HECO and the terminal operators to look for opportunities to reduce port-related emissions through electrification projects.

Hawai'i Department of Health (HDOH) Hazard Evaluation and Emergency Response Office (HEER):

Regarding planning for sea-level rise during the Harbor Improvements, the HDOH HEER Office would like to add that whatever improvements will be made at Honolulu Harbor, there should be mitigation measures incorporated against likely additional methane (and hydrogen sulfide gas generation) generation as a result of submergence of residual petroleum in Honolulu Harbor soils. Such an effect has been observed at an active fuel facility in Honolulu Harbor and it is likely applicable to other Honolulu Harbor locations with petroleum remaining in the ground. Methane is explosive above 5% in the presence of a certain amount of oxygen and a spark. Previous methane measurements in the area may not be representative for future conditions due to additional methane generation if shallow petroleum is submerged. Additionally, concentrations in vapor are dependent upon barometric pressure and can change with changing weather conditions. Design of buildings should be equipped with methane detection and mitigation measures, and it is desirable to aerate beneath the concrete slab to introduce more oxygen for conversion of methane to carbon dioxide by methane degrading bacteria. The thicker and longer surface expressions such as concrete slabs are, the less oxygen will be introduced from the surface and the more methane can accumulate under a slab. This can place Harbor users and construction workers at risk by fire or explosions (or even asphyxiation).

A: DOT-H appreciates the information and recommendations regarding mitigating methane and hydrogen sulfide gas generation and will incorporate this information into the HHMP. DOT-H will continue to consult with the HEER office to ensure that the existing and planned port facilities are prepared for the challenges posed by climate change and sea level rise and its effects on residual petroleum in the soils around Honolulu Harbor.

APPENDIX F
PUBLIC PARTICIPATION PLAN

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Database Marketing

Economic & Social Impact Studies

Evaluations

Research

Modeling/Forecasting

March 8, 2019 updated July 28, 2020

Honolulu Harbor 2050 Master Plan Public Participation Plan

Since pre-contact times, when Honolulu Harbor was known as “Ke ‘Awa O Kou” (the harbor of Kou) and seafaring Hawaiians preferred Waikīkī’s oceanfront to the deep-water harbor for landing their shallow-draft outrigger canoes, waterborne transportation has been central to Hawai‘i’s way of life, economic well-being and identity. As a remote island community, Hawai‘i remains essentially dependent on maritime transport for the movement of people, materials and goods that sustain and enhance the State’s economic prosperity and quality of life.

Today, Honolulu Harbor annually handles over 12 million tons of cargo, including daily essentials such as food and commercial goods that stock our store shelves, as well as less obvious necessities such as aggregate and other construction materials; jet fuel for private, commercial and military aircraft; automobiles; and equipment and machinery for local industry. Honolulu Harbor is the critical central hub of the State’s commercial harbor system; all overseas imports arrive at Honolulu Harbor before being distributed to the neighbor islands, and most cargo transported between the mainland U.S. and the Hawaiian Islands passes through Honolulu Harbor before moving on to its final destination. The maritime services that the harbor provides are crucial to the State’s population as about 80 percent of Hawai‘i’s goods and materials are imported, of which more than 95 percent arrive by ship through Honolulu Harbor.

To ensure that the primary port-of-entry into the State is prepared to meet the future needs of our community and of the maritime industry, the Department of Transportation (DOT), Harbors Division (DOT-H) has embarked on the *Honolulu Harbor 2050 Master Plan* (HHMP), which will update the previous, *Oahu Commercial Harbors 2020 Master Plan* completed in 1997. The HHMP will serve as a critical tool for the strategic development of Honolulu Harbor in terms of its use, infrastructure improvements, and optimization of the port and its facilities to best serve the future cargo handling, storage and distribution requirements for both domestic, international, and inter-island maritime transportation, as well as non-cargo maritime operations such as fishing, passenger and maritime support services. The HHMP will consider current requirements and challenges with Honolulu Harbor, as well as anticipated user needs and projections to guide new development and harbor usage over its planning horizon.

The HHMP is being developed through a public outreach program involving maritime and non-maritime stakeholders, including harbor users, adjacent landowners, government agencies, civic organizations and the public. The HHMP planning process is anticipated to take two years to complete. There are three phases of the process: Research, Data Gathering and Studies; Alternatives Development; and Draft and Final Plan.

Research and data gathering included consulting with stakeholders and input from industry professionals. A Technical Advisory Committee (TAC) and Sub-TAC committees were formed to provide industry-specific data and insights. The TAC and sub-TACs are comprised of maritime and non-maritime stakeholders. Outreach and participation of the general public will be conducted primarily through Public Information Meetings (PIM). TAC and Sub-TAC members will also be invited to these meetings. During the alternative development phase stakeholder input will be obtained through a Planning Advisory Committee (PAC), which will provide general review of proposed alternatives. project information and updates are also available at https://honoluluharbormp.com/.

Three PIMs are planned for this project, the purpose of which is to inform the community of the planning process, present development alternatives being considered, and gather public input on the project. The PIMs will be planned in collaboration with the Department of Transportation's Office of Civil Rights (OCR) and will meet Title VI of the *Civil Rights Act of 1964* requirements, including requirements for Limited English Proficiency (LEP) groups, and *The Americans with Disabilities Act of 1990.*

The purpose of the *HHMP Public Participation Plan* (PPP) is to describe the steps that will be taken to ensure that outreach to stakeholders, particularly the public, is conducted with the guidelines established by the OCR consistent with the *Civil Rights Act of 1964* requirements and *The Americans with Disabilities Act of 1990.*

Title VI

Title VI of the *Civil Rights Act of 1964* states that "[N]o person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."

As a recipient of federal financial assistance, DOT is required to comply with various nondiscrimination laws and regulations, the focal point of which is Title VI. Additionally, the *Civil Rights Restoration Act of 1987* defined 'program' to make clear that discrimination is prohibited throughout an entire agency if any part of the agency receives federal financial assistance. Thus, DOT-H is required to comply with Title VI and related nondiscrimination laws, and regulations.

A series of public informational meetings will be held throughout the planning process to integrate comments from stakeholders, public agencies, adjacent landowners and the public. OCR has provided technical support throughout the HHMP planning process to ensure Title VI requirements are being met. Voluntary *Title VI Public Involvement Data Cards* will be distributed at all public informational meetings and collected at the end of each for submission to OCR.

Environmental Justice

In 1994, the President signed Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (EJ). EJ is defined as the fair treatment and meaningful involvement of people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws,

regulations, and policies. EJ resulted from research that called attention to the disproportionate distribution of adverse impacts on the health of, and the environment surrounding, minority and low-income populations.

EJ is intended to promote nondiscrimination in federal programs substantially affecting human health and the environment and to provide minority and low-income communities access to public information on, and an opportunity for, public participation in matters relating to human health or the environment. Environmental considerations can include matters of cultural impact as well.

Because HHMP projects have the potential for creating an adverse impact on minority and low-income populations, special efforts will be made to involve representatives from affected groups. Also, various techniques will be used to effectively notify such groups of public informational meetings. EJ standards require that DOT-H take the following steps with respect to EJ populations:

1. determine if there is a protected population,
2. determine if an adverse effect exists,
3. determine if there is a disproportionate impact,
4. identify the benefits and the burdens of DOT-H's actions,
5. identify the changes that might avoid, minimize, or mitigate any negative impact, and
6. identify the overall effectiveness of public involvement.

Multiple public outreach efforts by DOT-H to minority and low-income populations surrounding Honolulu Harbor will meet the intent and fulfill the public involvement requirements of EJ. Notices will be distributed to stakeholders including harbor users, public agencies adjacent landowners and the public via emailed invitations, website announcements, flyers posted in public spaces, public notice published in the *Honolulu Star Advertiser* newspaper, and public announcements broadcast on a local radio station. Printed notices will offer language translation, and auxiliary aid/service or other accommodation (e.g., sign language interpreter, accessible parking, or materials in alternative format).

A demographic analysis was completed to analyze and identify possible minority and low-income populations, and this information is being used to further target these populations.

Limited English Proficiency

In 2000, the President signed Executive Order 13166, *Improving Access to Services for Persons with Limited English Proficiency* (LEP). LEP requires federal agencies to examine the services they provide, identify any need for services to LEP populations, and develop and implement a system to provide those services so LEP persons can have meaningful access to them.

LEP directs states agencies receiving federal financial assistance to address the needs of individuals with LEP to access and participate in state programs and activities, respectively. To assist in carrying out these responsibilities, the US Department of Justice has issued a policy guidance document, *Enforcement of Title VI of the Civil Rights Act of 1964 National Origin Discrimination Against Persons with Limited English Proficiency.* This LEP guidance sets forth the compliance standards that recipients of Federal financial assistance must follow to ensure that their programs and activities normally provided in English are accessible to LEP persons, and do not discriminate on the basis of national origin in violation of Title VI's prohibition against national origin discrimination.

In 2006, the Hawaii legislature recognized and acknowledged that language is a barrier for those living in Hawai‘i who have identified themselves as being limited English proficient. Consequently, the legislature passed Act 290, later codified in Hawaii Revised Statutes (HRS), Chapter 371, Sections 31 to 37 (HRS 371-31 to 37), to ensure that LEP individuals have equal, meaningful access to state-funded services, programs and activities. HRS 321C has since replaced HRS 371 as the legislation regarding language access. This law applies to state agencies and covered entities that receive state funding and provide services to the public. These groups are required to establish a language access plan and take reasonable steps to ensure they provide meaningful access to LEP populations.

LEP requires DOT-H to assess and address the needs of individuals seeking access to DOT-H programs and activities who, due to limited English proficiency, cannot fully and equally participate in or benefit from those programs and activities. Therefore, DOT-H will take reasonable steps to ensure meaningful access to LEP individuals seeking to participate in DOT-H programs and activities intended for the public consistent with the language access plan adopted by DOT. Multilingual signage will be posted at all public informational meeting sites to allow individuals with limited English proficiency to request interpretation services in their spoken language.

DOT-H activities and responsibilities relative to LEP services include the following:

1. assessing and addressing the needs of eligible persons,
2. ensuring that responsible steps are taken to ensure meaningful access,
3. developing and implementing monitoring control mechanisms to ensure ongoing compliance, and
4. compliance, monitoring and oversight.

Title VI Requirements

Below are the actions that have been and will be taken to ensure that Title VI and LEP requirements as described by DOT Title VI program are met.

- Prior to the meeting a demographic analysis will be conducted of the relevant area. This analysis identifies significant-sized demographic groups that have Limited English Proficiency (LEP), for which appropriate meeting notices will be developed and distributed.
- All notifications for the PIM will include information on how people can request language interpretation.
- Title VI Data Cards
    - The Data Cards are voluntary and collect information for OCR on the demographics of the people attending the meeting.
    - The Data Cards will be available at the sign-in table and collected at the end of the meeting to be submitted to the OCR.
- A sign for LEP groups will be posted near the entrance to the meeting venue and at the sign-in table. If requested ahead of time, reasonable requests for foreign language interpreters and/or a sign-language specialist will be accommodated. If it is infeasible to provide an interpreter, efforts must be documented, and the meeting coordinator must discuss other accommodations with the person with the disability.

DEMOGRAPHIC ANALYSIS

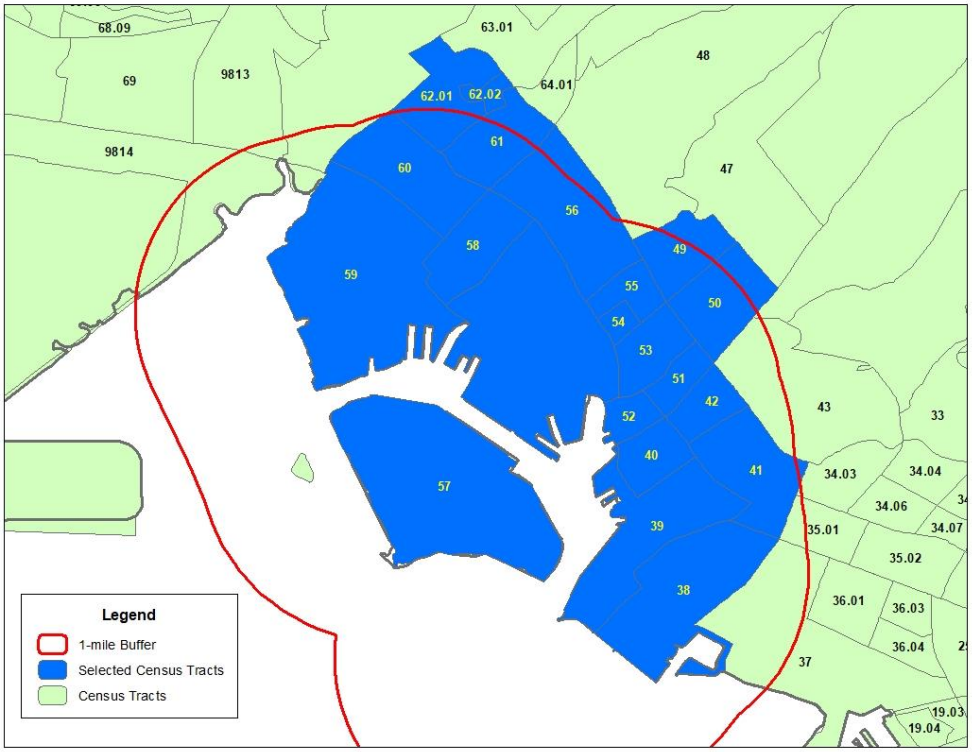
Definition of Community

The State of Hawai'i has a population of 1.4 million residents and the City and County of Honolulu is the largest county with a population of 988,650 residents.[1] While the Honolulu Harbor serves the whole state, it was determined that the following Census Tracts be considered as the Community for the purposes of the Public Participation Plan for the HHMP.

Census tracts are the preferred geographic grouping for community because of the wealth of data provided in the American Community Survey and U.S. Census that are available by Census tracts. For purposes of defining community a perimeter was drawn roughly one mile away from the harbor to identify the Census tracts that the perimeter included and/or intersected. Of these, 18 Census tracts were totally or mostly within the perimeter and included within the community. Tracts included in the definition of Community are shown in blue in the following map.

An additional consideration included in community are those Census tracts along major thoroughfares to the H-1 Freeway used by truckers carrying shipments to and from Honolulu Harbor. The primary roads to access to H-1 eastbound are Kalihi Street or Middle Street. The primary access westbound is Nimitz Highway.

Figure 1: Map of Honolulu Harbor and Community



In addition to the tracts completely within the perimeter, two additional tracts are included. Tract 62.01 was only partially touched by the perimeter but given its location between Middle Street

[1] US Census, American Community Survey, 2017.

and Kalihi Street, this census tract was included. Census tract 62.02 does not touch the perimeter at all but given that it is surrounded by tracts we are including and is also between Middle Street and Kalihi Street, this tract was included.

Table 1: Census Tracts for PPP Community

Proposed Census Tracts for Honolulu Harbors Public Participation Plan				
Census Tract	**Name**	**Resident Pop***	**Households***	**% non****
38	Kakaʻako	4,403	2,268	30%
39	Civic Center	286	229	30%
40	Financial District	1,144	664	50%
41	Queen's Hospital	4,136	2,189	30%
42	Queen Emma Gardens	3,453	1,861	30%
49	Lanakila	3,135	891	50%
50	Kuakini	4,775	1,597	40%
51	Foster Botanical Gardens	3,287	1,614	50%
52	Chinatown	2,860	1,386	50%
53	Aʻala	3,954	1,558	50%
54	Mayor Wright Housing	1,669	427	50%
55	Pālama	2,091	595	50%
56	Kapālama	7,428	1,859	40%
57	Iwilei-Ānuenue	2,420	858	50%
58	Waiakamilo Road	3,290	997	50%
59	Mokauea Street	4,124	630	40%
60	Umi Street	6,542	1,289	50%
61	Kalihi Waena	4,431	814	50%
62.01	Kam IV Road	6,433	1,548	50%
62.02	Linapuni Street	1,731	370	32%
		71,592	23,644	

Four Census tracts are partially included in the perimeter: Census tracts 35.01 (Academy of Arts), 37 (Ala Moana), 43 (Punchbowl) and 66 (Kahauiki Street). The one-mile perimeter includes less than half of the total land tract and there are few direct connections with the harbor, therefore we recommend these not be included in the definition of community for purposes of the PPP. A part of Census tract 9814 is also with the perimeter, however this is a commercial census tract and includes only four persons.

In addition to those Census tracts the PPP community also includes a special outreach effort to the portion of Census tract 9814 below the H-1 that includes Kahauiki Village, a recent low-income community developed to house formerly homeless families. In addition, there are people living on or on a boat docked at Mokauea Island. Special outreach efforts will be developed to include these individuals.

Community Household Characteristics

The 20 Census Tracts in the Community include 71,488 residents in 26,031 households (detailed demographics included in the Appendix). Of the population age five and older, 40 percent speak "English less than very well." By languages, there are three groups that meet or exceed the U.S. Department of Transportation *Safe Harbor* guidelines "for provision of written documents for each eligible Limited English Proficiency (LEP) language group that constitutes 5 percent or 1,000, whichever is less, of the population of persons eligible to be served or likely to be affected or encountered."[2]

To identify LEP by language within the designated community, the most recent ACS report available at the Census Tract level LANGUAGE SPOKEN AT HOME FOR THE POPULATION 5 YEARS AND OVER was generated. The following are the five groups for which LEP exceeded 5 percent or 1,000.persons.

Table 2: LEP by Language within the Harbors Community

Language Spoken At Home	Number Age 5+	% of Total Pop
Korean:	1,971	
Speak English "very well"	269	
Speak English less than "very well"	1,702	2.51%
Chinese (incl. Mandarin, Cantonese):	8,322	
Speak English "very well"	1,554	
Speak English less than "very well"	6,768	9.96%
Vietnamese:	1,783	
Speak English "very well"	353	
Speak English less than "very well"	1,430	2.11%
Tagalog (incl. Filipino):	7,390	
Speak English "very well"	1,942	
Speak English less than "very well"	5,448	8.02%
Other Asian and Pacific Island languages:	15,641	
Speak English "very well"	4,227	
Speak English less than "very well"	11,414	16.81%

The first four groups will require translations of PIM meeting notices:

- Korean;
- Chinese (Traditional);
- Vietnamese;
- Filipino (Tagalog and Ilocano).

The "Other Asian and Pacific Island" language group is less defined. For further insight the *ACS Race* report was run for the Harbor Community. Based on Table 3, those categories that may fall within this language group for whom English is not a primary language are:

- Japanese;
- Samoan; and
- Other Pacific Islander.

[2] Federal Register/Vol.70, No 239/ Wednesday, December 14, 2005/ Notices, Department of Transportation, Office of the Secretary, [Docket No. OST-2001-8695], Policy Guidance Concerning Recipients' Responsibilities to Limited English Proficient (LEP) Persons. 74095

Table 3: Race within the Harbors Community

RACE	Harbors Community	% of Population
Total population	71,488	
One race	61,158	
Two or more races	10,330	
One race	61,158	
White	6,606	9.2%
Black or African American	897	1.3%
American Indian and Alaska Native	50	0.1%
Asian	44,912	62.8%
Asian Indian	95	0.1%
Chinese	9,993	14.0%
Filipino	20,077	28.1%
Japanese	7,141	10.0%
Korean	2,358	3.3%
Vietnamese	1,756	2.5%
Other Asian	3,492	4.9%
Native Hawaiian and Other Pacific Islander	8,150	11.4%
Native Hawaiian	2,184	3.1%
Guamanian or Chamorro	22	0.0%
Samoan	1,904	2.7%
Other Pacific Islander	4,040	5.7%
Some other race	543	0.8%
Two or more races	10,330	14.4%
American	294	0.4%
White and American Indian and Alaska Native	188	0.3%
White and Asian	1,682	2.4%
Black or African American and American Indian and Alaska Native	9	0.0%

In the *Top 25 Detailed Languages Other than English Spoken at Home and Ability to Speak English* report[3] showed that statewide Marshallese was the top ranked Pacific Islander language and 55 percent of that population spoke English "less than very well."

[3] Hawai'i Databook 2017, US Census Bureau, "Detailed Languages Other than English Spoken at Home and Ability to Speak English for the Population 5 Years and Over: 2009-2013 (October 2015) and calculations by the Hawai'i State Department of Business, Economic Development and Tourism

Given the languages and races within the Harbor Community the languages that will receive special attention are:

- Korean;
- Chinese (Mandarin and Cantonese);
- Vietnamese;
- Filipino (Tagalog and Ilocano)
- Japanese;
- Samoan; and
- Marshallese.

Implementation Plan

PIM NOTIFICATION METHODS

Prior each PIM, notification of the meeting will be made via:

- State of Hawai‘i Department of Transportation webpage;
- Paid meeting notice in the
    - Honolulu Star Advertiser;
    - Hawai‘i Chinese News;
    - Hawai‘i Hochi and the Hawai‘i Herald;
    - Filipino Chronicle.
- Informational flyers posted around the project area that meet LEP requirements.
    - Flyers will be created in English and the languages listed above.
    - Flyers will be distributed throughout the Harbor Community, focusing on businesses, not-for-profits serving these ethnic groups and churches.
        - Homeless Outreach programs that serve the Community will be given flyers to distribute to homeless in the Community.
    - Flyers will be given to the Kahauiki Village to be given to residents.
    - Flyers will be posted near where Mokuaea Island boat residents commute to and from the Harbor.
- Media releases and/or public service announcements will be sent to:
    - Honolulu Star Advertiser
    - Major radio stations including:
        - KSSK – Number One station in drive time
        - KHPR -Hawai‘i Public Radio
        - KPRP – Filipino language
        - KQHU-LP – Chinese language
        - KREA – Korean language
        - KUPA – Chinese language
        - KZOO – Japanese language

Meeting notices and releases will:

- Invite residents to the meeting;
    - Provide a short overview of the meeting; provide date, time and address.
    - Who to contact for future information.
    - Describe how people with special language needs can request interpretation services.

Key community leaders have been identified and are included in the stakeholder list maintained by RM Towill (RMT). During the individual stakeholder meetings, efforts are made to provide information to these key figures so that they may assist in disseminating information to the community. Community leaders will also be asked to assist with identification of LEP groups within their community and distribution of notifications.

MEETING VENUE

The PIMs will be held at the Pier Two Terminal, 521 Ala Moana Suite 201 Pier 2 Honolulu, HI 96813. The terminal is in a central location for the Harbor Community and can accommodate a large number of attendees. The facility has ample parking and allows access for individuals with disabilities.

The meeting will be facilitated by a member of the RMT Group.

PIM MEETING OUTLINE

The meeting will follow the format below:

- Welcome by Facilitator who will explain the purpose of the meeting.
- Introduce the DOT-H representative.
- Welcome on behalf of DOT-H. High level description of the planning process and the phase the HHMP.
- Facilitator – introduce RMT Project Manager.
- Project Presentation
- Overview
- Options being considered at this time
- Timetable
- Next Steps
- Input and Q&A Session – Facilitator
- DOT-H thanks everyone for attending the meeting.

MATERIALS FOR THE MEETING

The following will be prepared for the meeting:

- Meeting Sign – to be placed at the intersection of Ala Moana Boulevard and Channel Street, and outside the Passenger Terminal.
- Directional Signage – directing attendees from the parking area to the meeting site.
- Sign-in Sheet – to record the number of meeting attendees and enable attendees to provide contact information for updates on the project.
- Project Information Sheet – One-page project summary to be distributed at the meeting.
- Name Badges – to identify project team to meeting attendees.
- Title VI Data Cards will be at the sign-in table and collected at the end of the meeting and submitted to the OCR.
- The sign for LEP groups will be posted near the entrance to the meeting venue. If requested ahead of time, meetings will also include foreign language interpreters and/or a sign-language specialist.

EVALUATION PROCESS AFTER THE MEETING

After the meeting a debriefing session will take place and a detailed report will be completed that includes the following information:

- Meeting General Information: date, time, purpose, DOT attendees, consultants, actual meeting agenda, materials distributed.
- Attendees: number of attendees, number of special guests, copy of sign-in sheet.
- Copy of flyer used, and locations where it was posted.
- How Title VI requirements were fulfilled and any related issues that may have come up.
- Evaluation/suggestions for improvements.

POTENTIAL TIMELINE

Individual meetings with stakeholders have been conducted since January 2018 and will continue to be conducted as needed.

A TAC meeting was conducted on July 18, 2018. Three more TAC meetings will be conducted in conjunction with the PIM meetings.

Fifteen Sub-TAC meetings were conducted from September 6 to November 16, 2018. Sub-TAC members will be invited to PIMs.

The first PIM will be conducted in the second quarter of 2019. Two more meetings are planned for later in the planning process.

Four PAC meetings are scheduled with the first to take place before the first PIM.

COORDINATION TIMELINE FOR PIM

- **Ten Weeks Prior**
  - Finalize PIM date and times.
  - Establish pre-PIM meeting date (about a week prior to the PIM) to go over the project with DOT-H.
  - Finalize Public Participation Plan (SMS)

- **At Least Six Weeks Prior**
  - Prepare public notice announcement in English for DOT-H approval. (RMT)
  - Upon approval translate announcement into Chinese, Japanese and Filipino (note that this can also be done by the publication)
  - Finalize appropriate channels for notification of the public meeting (foreign language newspapers or radio), sites for flyer distribution and quantity required. (RMT)

- **Four Weeks Prior**
    - Prepare press release draft for Public Information Officer. (Tim Sakahara)
    - Send presentation materials to DOT-H for review. (RMT)
    - Prepare internal FAQs. (RMT)

- **Two Weeks Prior**
    - Post flyers around the Harbor Community (RMT)

- **One Week Prior**
    - Meet with DOT-H for a dry run of the meeting presentations including going through materials and the agenda for the presentation. (RMT)

- **Two Weeks after the Meeting**
    - Submit meeting evaluation. (RMT/SMS)

Amended Implementation Plan (November 2020)

Background

On March 23, 2020, Governor David Ige issued a Third Supplementary Proclamation Related to COVID-19. In that proclamation it states " C. Prohibited Activities Outside the Home or Place of Residence - Pursuant to current guidance from the Centers for Disease Control and Prevention (CDC), any gathering of more than ten people is prohibited unless exempted by this Proclamation."[4] Recognizing that this restriction may not be lifted before the PIM and to minimize the chance of COVID-19 spread during a public meeting, it was decided to change the meeting format from an in-person gathering to a virtual meeting format conducted online and/or televised. The implementation plan has been adjusted accordingly.

PIM NOTIFICATION METHODS

Notification methods have changed slightly recognizing that more people are working from home and staying at home because of COVID-19, therefore posters/signage will be less seen and other methods will receive more attention.

Prior to the PIM, notification of the meeting will be made via:

- The project website: www.honoluluharbormp.com and the State of Hawai'i Department of Transportation - Harbors webpage: www.hidot.hawaii.gov/harbors. The meeting information available on these websites will comply to the extent reasonably possible with Web Content Accessibility Guidelines (WCAG) 2.0 Level AA.
- Paid meeting notice in the following publications if they are still publishing (some may have closed down due to the economic downturn resulting from COVID):
    - Honolulu Star Advertiser;
    - Hawai'i Chinese News;
    - Hawai'i Hochi and the Hawai'i Herald;
    - Filipino Chronicle.
- Informational flyers distributed in key locations around the project area that meet LEP requirements.
    - Flyers (8.5 x 11") will be created in English and the following languages:
        - Korean
        - Chinese (Mandarin and Cantonese)
        - Vietnamese
        - Filipino (Tagalog and Ilocano)
        - Japanese
        - Samoan and
        - Marshallese.
    - Flyers will be distributed in the Harbor Community focusing on not-for-profits and churches serving identified ethnic groups.
    - Homeless Outreach programs that serve the Harbor Community will be given flyers to distribute where homeless people congregate in the Community.

[4] Office of the Governor, State of Hawaii, Third Supplementary Proclamation, March 23, 2020.

    - Flyers will be given to the administrative offices at Hale Mauliola and Kahauiki Village to be posted where it can be seen by residents.
    - Flyers will be posted near where Mokuaea Island boat residents commute to and from the Harbor.
- Media releases and/or public service announcements will be sent out by the HDOT Public Information Office to:
    - Honolulu Star Advertiser
    - Major radio stations including:
        - KSSK – Number One station in drive time
        - KHPR -Hawai‘i Public Radio
        - KRTR - English
        - KPRP – Filipino language
        - KQHU-LP – Chinese language
        - KREA – Korean language
        - KUPA – Chinese language
        - KZOO – Japanese language
- Email blasts will be sent out to PAC, TAC, and Sub-TAC members by the RMT Project Team.
- Public service announcements will be considered if a televised approach is undertaken.
- DOT’s Facebook and Twitter accounts.

The meeting notice and release will:

- Create awareness for the meeting and encourage registration/participation for the meeting.
    - Provide the date, time, and how to watch the meeting, and how to access the meeting online.
        - A description on how to access additional viewings of the meeting will be provided.
    - How to register for the meeting.
    - Provide the purpose of the meeting.
    - Describe how people with special language needs can request interpretative services.
    - Persons seeking more detailed information will be directed to the project website www.honoluluharbormp.com .

Key community leaders have been identified and are included in the stakeholder list maintained by RMT. During the individual stakeholder meetings, efforts are made to provide information to these key figures so that they may assist in disseminating information to the community. Community leaders will also be asked to assist with identification of LEP groups within their community and distribution of notifications.

MEETING ARRANGEMENTS

The meeting will be conducted virtually using an online meeting platform (Zoom) and/or broadcast on community television (‘Ōlelo). Rebroadcasts of the meeting will be made available for public viewing.

- The meeting will take place at an appropriate time and place.

- During the live broadcast, the public will be encouraged to submit questions and comments by any of the following methods:

    - Call-in to a phone bank staffed by Project Team members.
    - Raise hand and/or chat function within the virtual meeting platform.
    - Email via the project website.
    - Comments received during the live broadcast will be vetted by the Project Team for response during the broadcast, as time allows. The live broadcast will not include live dialogue with public viewers.

- During subsequent broadcasts of the pre-recorded presentation, the public will be encouraged to submit questions and comments by email via the project website or by letter.

- Public comments will be accepted for a minimum of 15 days following the date of the original, live broadcast.

    - All public comments received during the live broadcast or subsequent re-broadcasts will be addressed in writing, documented in the public project record and posted on the project website. Written responses will not be sent to individuals who provide comments.

- Reasonable attempts will be made to provide translation services to people who have requested language accommodations two weeks or more in advance of the meeting. If a live translation cannot be provided, the request will be met by providing translated meeting materials/project information.
    - Live translation services will utilize the State's contract which can be accessed at: https://spo.hawaii.gov/wp-content/uploads/2020/05/20-17.pdf
    - Comments received in other-than-English language will be translated either during or after the meeting, and a response will be provided in English and in the original language. All comments/questions and responses will be included in the meeting documentation and posted on the project website: www.honoluluharbormp.com.

PIM MEETING OUTLINE

The meeting will follow the format below:

- Welcome by Facilitator who will explain the purpose of the meeting and encourage viewers to complete a Title VI Data "card" if not done when they registered.
- Introduce the DOT-H representative.
- Welcome on behalf of DOT-H. High level description of the planning process and the HHMP.
- Facilitator explains how people can ask questions and how the questions will be addressed live, and if we can't get through all the questions that they will be available at the project website.
- Facilitator – introduce RMT Project Manager.
- Project Presentation with Q&As in-between sections.
- Harbor options being considered at this time
- Timetable
- Next Steps

- Input and Q&A Session – Facilitator
- Facilitator to let viewers know they can access all the questions and responses on the project website, www.honoluluharbormp.com, in addition to view future airings of the meeting.
- DOT-H thanks everyone for attending the meeting.

MATERIALS FOR THE MEETING

The following will be prepared for the meeting:

- Online registration method for the meeting.
    - To record the number of anticipated participants.
    - To enable participants to provide contact information for updates on the project.
        - To send Title VI Data "Cards" and encourage participants to complete these "cards."
            - Cards will be in a PDF fill in form that can be returned to RMT.
- The project website will include:
    - Date, time, and how to watch the meeting live (if available), and how to access the meeting online.
        - How to access rebroadcasts or videos of the meeting.
    - Project Information Sheet – one-page project summary that can be viewed online or downloaded.
    - Registration link.
    - Title VI Data "card" link.
    - How people with special language needs can request interpretation services two weeks prior to the meeting.

EVALUATION PROCESS AFTER THE MEETING

After the meeting, a debriefing session will take place and a detailed report will be completed and will be shared with OCR. The report will include the following information:

- General Meeting Information: date, time, purpose, method, DOT attendees, consultants, actual meeting agenda, materials distributed or available online.
- Attendees: number of attendees, number of special guests, registration information.
- Copy of flyer and locations where it was posted/sent.
- Media release used and how it was covered by the media.
- How Title VI requirements were fulfilled and any related issues that may have come up.
- Evaluation/suggestions for improvements.

POTENTIAL TIMELINE

The HHMP planning process continues to engage in extensive stakeholder outreach to understand issues/concerns related to the harbor and to gather input on master plan alternatives being developed. Outreach has consisted of a series of one-on-one stakeholder meetings, Technical Advisory Committee (TAC) meetings, TAC subcommittee (Sub-TAC) meetings and Planning Advisory Committee (PAC) meetings, which will culminate in presentation of the draft HHMP at the PIM.

Individual meetings with stakeholders have been conducted since January 2018 and will continue to be conducted as needed.

A kick-off TAC meeting was conducted on July 18, 2018. The second TAC meeting is tentatively scheduled for late 2020.

Fifteen Sub-TAC meetings were conducted from September 6 to November 16, 2018. Sub-TAC members will be invited to the PIM.

Three PAC meetings were held between September 2019 and September 2020. A fourth PAC meeting is targeted for the first quarter 2021, after the PIM.

The PIM is planned for early 2021.

COORDINATION TIMELINE FOR PIM

- **Ten Weeks Prior**
  - Finalize PIM date and time.
  - Finalize arrangements for the conducting the presentation and the questions and answers session.
  - Establish pre-PIM meeting date (about two weeks prior to the PIM) to go over the project with DOT-H.
  - Finalize Public Participation Plan (SMS)

- **At Least Six Weeks Prior**
  - Prepare paid public notice announcement in English for DOT-H approval. (RMT)
  - Upon approval translate announcement into Chinese, Japanese, and Filipino (translations handled by SMS or done by the publication)
  - Design flyer and translate into the six languages. (RMT, SMS)
  - Finalize appropriate channels for notification of the public meeting (foreign language newspapers or radio), sites for flyer distribution and quantity required. (RMT)
  - Update websites to provide the information about the meeting as noted earlier. (RMT)

- **Four Weeks Prior**
  - Prepare press release draft for Public Information Officer. (Tim Sakahara)
  - Send presentation materials to DOT-H for review. (RMT)
  - Prepare internal FAQs. (RMT)
  - Print Flyers (RMT)
  - Distribute flyers to select Harbor Community members (RMT)

- **Two Weeks Prior**
  - Make arrangement for LEP requests received. (RMT)
  - Meet with DOT-H for a dry run of the meeting presentation including going through materials and the agenda for the presentation. (RMT)

- **One Week Prior**
  - Technical run through of the meeting including televising and options for viewers to call in to comment and/or ask questions through telephone lines, emails and chat functions. (RMT)

- **Two Weeks after the Meeting**
  - Submit meeting evaluation. (RMT/SMS)

Appendix

The following are characteristics of the Harbor's Community as defined in this plan. The source of the information is American Community Survey 2017.

Appendix A – Demographics Page One

Demographics of Harbor's Community		Harbors Community
GENDER		
Total population		71,488
Male		35,791
Female		35,697
AGE		
Under 5 years		3,568
5 to 9 years		3,357
10 to 14 years		3,535
15 to 19 years		3,589
20 to 24 years		4,928
25 to 34 years		11,149
35 to 44 years		9,365
45 to 54 years		9,761
55 to 59 years		4,777
60 to 64 years		4,395
65 to 74 years		6,409
75 to 84 years		4,516
85 years and over		2,139
Median age (years)		41
Under 18 years		12,404
16 years and over		60,361
18 years and over		59,084
21 years and over		56,351
62 years and over		15,526
65 years and over		13,064
RACE		
Total population		71,488
One race		61,158
Two or more races		10,330
One race		61,158
White		6,606
Black or African American		897
American Indian and Alaska Native		50
Cherokee tribal grouping		13
Chippewa tribal grouping		0
Navajo tribal grouping		0
Sioux tribal grouping		0
Asian		44,912
Asian Indian		95
Chinese		9,993
Filipino		20,077
Japanese		7,141
Korean		2,358
Vietnamese		1,756
Other Asian		3,492
Native Hawaiian and Other Pacific Islander		8,150
Native Hawaiian		2,184
Guamanian or Chamorro		22
Samoan		1,904
Other Pacific Islander		4,040
Some other race		543

Appendix A – Demographics Page Two

HISPANIC OR LATINO AND RACE	
Total population	71,488
Hispanic or Latino (of any race)	5,583
Mexican	1,057
Puerto Rican	1,651
Cuban	197
Other Hispanic or Latino	2,678
Not Hispanic or Latino	65,905
White alone	5,859
Black or African American alone	863
American Indian and Alaska Native alone	21
Asian alone	43,540
Native Hawaiian and Other Pacific Islander alone	7,951
Some other race alone	
Two or more races	7,671
Two races including Some other race	127
Two races excluding Some other race, and Three or more races	7,544
MARITAL STATUS	
Population 15 years and over	61,028
Now married (except separated)	25,179
Widowed	4,353
Divorced	6,159
Separated	1,226
Never married	24,114
EDUCATIONAL ATTAINMENT	
Population 18 to 24 years	6,573
Less than high school graduate	809
High school graduate (includes equivalency)	1,951
Some college or associate's degree	3,394
Bachelor's degree or higher	419
Population 25 years and over	52,511
Less than 9th grade	6,777
9th to 12th grade, no diploma	5,722
High school graduate (includes equivalency)	14,403
Some college, no degree	8,556
Associate's degree	4,783
Bachelor's degree	8,490
Graduate or professional degree	3,780
MEDIAN EARNINGS IN THE PAST 12 MONTHS (IN 2017 INFLATION-ADJUSTED DOLLARS)	
Population 25 years and over with earnings	35,528
Less than high school graduate	20,364
High school graduate (includes equivalency)	26,036
Some college or associate's degree	31,686
Bachelor's degree	40,392
Graduate or professional degree	47,267

Appendix B – Economic Characteristics Page One

Economic Characteristics of Harbor's Community		Harbors Community
EMPLOYMENT STATUS		
Population 16 years and over		60,361
In labor force		38,019
Civilian labor force		37,366
Employed		35,779
Unemployed		1,587
Armed Forces		653
Not in labor force		22,342
COMMUTING TO WORK		
Workers 16 years and over		35,352
Car, truck, or van -- drove alone		16,090
Car, truck, or van -- carpooled		4,561
Public transportation (excluding taxicab)		7,452
Walked		4,188
Other means		2,338
Worked at home		723
Mean travel time to work (minutes)		24
OCCUPATION		
Civilian employed population 16 years and over		35,779
Management, business, science, and arts occupations		8,941
Service occupations		11,263
Sales and office occupations		8,749
Natural resources, construction, and maintenance occupations		2,903
Production, transportation, and material moving occupations		3,923
INDUSTRY		
Civilian employed population 16 years and over		35,779
Agriculture, forestry, fishing and hunting, and mining		102
Construction		2,134
Manufacturing		1,355
Wholesale trade		825
Retail trade		4,229
Transportation and warehousing, and utilities		1,924
Information		821
Finance and insurance, and real estate and rental and leasing		2,105
Professional, scientific, and mgmt, and admin and waste mgmt services		3,537
Educational services, and health care and social assistance		6,630
Arts, entertainment, and recreation, and accommodation and food services		7,858
Other services, except public administration		2,068
Public administration		2,191
CLASS OF WORKER		
Civilian employed population 16 years and over		35,779
Private wage and salary workers		29,182
Government workers		4,778
Self-employed in own not incorporated business workers		1,771
Unpaid family workers		48

Appendix B – Economic Characteristics Page Two

INCOME AND BENEFITS (IN 2017 INFLATION-ADJUSTED DOLLARS)		
Total households		24,036
Less than $10,000		2,283
$10,000 to $14,999		1,543
$15,000 to $24,999		2,577
$25,000 to $34,999		1,773
$35,000 to $49,999		2,854
$50,000 to $74,999		4,562
$75,000 to $99,999		2,778
$100,000 to $149,999		2,928
$150,000 to $199,999		1,253
$200,000 or more		1,485
Median household income (dollars)		54,994
Mean household income (dollars)		73,441
With earnings		18,515
Mean earnings (dollars)		75,378
With Social Security		8,488
Mean Social Security income (dollars)		15,529
With retirement income		4,157
Mean retirement income (dollars)		20,629
With Supplemental Security Income		1,627
Mean Supplemental Security Income (dollars)		7,650
With cash public assistance income		1,388
Mean cash public assistance income (dollars)		2,971
With Food Stamp/SNAP benefits in the past 12 months		5,002
Families		14,264
Less than $10,000		714
$10,000 to $14,999		739
$15,000 to $24,999		1,302
$25,000 to $34,999		877
$35,000 to $49,999		1,780
$50,000 to $74,999		2,948
$75,000 to $99,999		1,848
$100,000 to $149,999		2,255
$150,000 to $199,999		832
$200,000 or more		969
Median family income (dollars)		61,849
Mean family income (dollars)		79,409
Per capita income (dollars)		594,331
		0
Nonfamily households		9,772
Median nonfamily income (dollars)		31,791
Mean nonfamily income (dollars)		47,315
Median earnings for workers (dollars)		32,623
Median earnings for male full-time, year-round workers (dollars)		44,923
Median earnings for female full-time, year-round workers (dollars)		39,496

Appendix B – Economic Characteristics Page Three

HEALTH INSURANCE COVERAGE		
Civilian noninstitutionalized population		68,241
With health insurance coverage		63,657
With private health insurance		43,618
With public coverage		28,523
No health insurance coverage		4,584
Civilian noninstitutionalized population under 19 years		13,177
No health insurance coverage		659
Civilian noninstitutionalized population 19 to 64 years		42,569
In labor force:		34,185
Employed:		32,819
With health insurance coverage		30,864
With private health insurance		27,600
With public coverage		4,252
No health insurance coverage		1,955
Unemployed:		1,366
With health insurance coverage		903
With private health insurance		505
With public coverage		453
No health insurance coverage		463
Not in labor force:		8,384
With health insurance coverage		6,998
With private health insurance		3,019
With public coverage		4,406
No health insurance coverage		1,386
POVERTY STATUS - Population for whom status is determined		68,755
Below poverty level		12,533
% below poverty level		18.2%

Appendix C- Housing Characteristics Page One

Housing Characteristics of Harbor's Community	Harbors Community
HOUSING OCCUPANCY	
Total housing units	26,031
Occupied housing units	24,036
Vacant housing units	1,995
	0
Homeowner vacancy rate	10
Rental vacancy rate	99
UNITS IN STRUCTURE	
Total housing units	26,031
1-unit, detached	3,290
1-unit, attached	1,873
2 units	493
3 or 4 units	923
5 to 9 units	1,861
10 to 19 units	2,385
20 or more units	15,170
Mobile home	36
Boat, RV, van, etc.	0
YEAR STRUCTURE BUILT	
Total housing units	26,031
Built 2014 or later	585
Built 2010 to 2013	176
Built 2000 to 2009	1,974
Built 1990 to 1999	3,219
Built 1980 to 1989	3,974
Built 1970 to 1979	6,088
Built 1960 to 1969	5,413
Built 1950 to 1959	2,884
Built 1940 to 1949	940
Built 1939 or earlier	778
ROOMS	
Total housing units	26,031
1 room	2,681
2 rooms	4,629
3 rooms	7,238
4 rooms	5,935
5 rooms	2,369
6 rooms	1,369
7 rooms	706
8 rooms	429
9 rooms or more	675
Median rooms	3.41

Appendix C- Housing Characteristics Page Two

BEDROOMS	
Total housing units	26,031
Studio	2,830
1 bedroom	7,226
2 bedrooms	10,603
3 bedrooms	3,362
4 bedrooms	1,004
5 or more bedrooms	1,006
HOUSING TENURE	
Occupied housing units	24,036
Owner-occupied	7,633
Renter-occupied	16,403
	0
Average household size of owner-occupied unit	2.79
Average household size of renter-occupied unit	2.90
YEAR HOUSEHOLDER MOVED INTO UNIT	
Occupied housing units	24,036
Moved in 2015 or later	2,435
Moved in 2010 to 2014	8,879
Moved in 2000 to 2009	6,751
Moved in 1990 to 1999	2,910
Moved in 1980 to 1989	1,403
Moved in 1979 and earlier	1,658
VEHICLES AVAILABLE	
Occupied housing units	24,036
No vehicles available	5,661
1 vehicle available	11,298
2 vehicles available	5,036
3 or more vehicles available	2,041
HOUSE HEATING FUEL	
Occupied housing units	24,036
Utility gas	1,006
Bottled, tank, or LP gas	165
Electricity	7,986
Fuel oil, kerosene, etc.	27
Coal or coke	0
Wood	3
Solar energy	195
Other fuel	8
No fuel used	14,646

Appendix C- Housing Characteristics Page Three

SELECTED CHARACTERISTICS	
Occupied housing units	24,036
Lacking complete plumbing facilities	278
Lacking complete kitchen facilities	801
No telephone service available	837
OCCUPANTS PER ROOM	
Occupied housing units	24,036
1.00 or less	19,799
1.01 to 1.50	2,358
1.51 or more	1,879
VALUE	
Owner-occupied units	7,633
Less than $50,000	133
$50,000 to $99,999	51
$100,000 to $149,999	58
$150,000 to $199,999	157
$200,000 to $299,999	1,332
$300,000 to $499,999	2,101
$500,000 to $999,999	3,445
$1,000,000 or more	356
Median (dollars)	407,540
MORTGAGE STATUS	
Owner-occupied units	7,633
Housing units with a mortgage	4,769
Housing units without a mortgage	2,864
SELECTED MONTHLY OWNER COSTS (SMOC)	
Housing units with a mortgage	4,769
Less than $500	13
$500 to $999	232
$1,000 to $1,499	715
$1,500 to $1,999	986
$2,000 to $2,499	727
$2,500 to $2,999	651
$3,000 or more	1,445
Median (dollars)	1,766
Housing units without a mortgage	2,864
Less than $250	222
$250 to $399	395
$400 to $599	638
$600 to $799	709
$800 to $999	335
$1,000 or more	565
Median (dollars)	545

Appendix C- Housing Characteristics Page Four

SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)	
Housing units with a mortgage (excluding units where SMOCAPI ca	4,753
Less than 20.0 percent	1,402
20.0 to 24.9 percent	637
25.0 to 29.9 percent	656
30.0 to 34.9 percent	645
35.0 percent or more	1,413
Not computed	16
Housing unit without a mortgage (excluding units where SMOCAPI	2,836
Less than 10.0 percent	1,152
10.0 to 14.9 percent	529
15.0 to 19.9 percent	394
20.0 to 24.9 percent	161
25.0 to 29.9 percent	112
30.0 to 34.9 percent	64
35.0 percent or more	424
Not computed	28
GROSS RENT	
Occupied units paying rent	15,993
Less than $500	2,568
$500 to $999	3,896
$1,000 to $1,499	5,013
$1,500 to $1,999	2,745
$2,000 to $2,499	1,020
$2,500 to $2,999	413
$3,000 or more	338
Median (dollars)	1,077
No rent paid	410
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)	
Occupied units paying rent (excluding units where GRAPI cannot b	15,692
Less than 15.0 percent	1,981
15.0 to 19.9 percent	1,846
20.0 to 24.9 percent	1,927
25.0 to 29.9 percent	2,043
30.0 to 34.9 percent	1,691
35.0 percent or more	6,204
Not computed	711

Appendix D- Language Spoken at Home

Language Spoken at Home of Harbor's Community	Harbors Community	% of total Pop
Total:	67,920	
Speak only English	31,379	
Spanish:	700	
Speak English "very well"	516	
Speak English less than "very well"	184	0.27%
French, Haitian, or Cajun:	64	
Speak English "very well"	60	
Speak English less than "very well"	4	0.01%
German or other West Germanic languages:	78	
Speak English "very well"	72	
Speak English less than "very well"	6	0.01%
Russian, Polish, or other Slavic languages:	83	
Speak English "very well"	71	
Speak English less than "very well"	12	0.02%
Other Indo-European languages:	258	
Speak English "very well"	194	
Speak English less than "very well"	64	0.09%
Korean:	1,971	
Speak English "very well"	269	
Speak English less than "very well"	1,702	2.51%
Chinese (incl. Mandarin, Cantonese):	8,322	
Speak English "very well"	1,554	
Speak English less than "very well"	6,768	9.96%
Vietnamese:	1,783	
Speak English "very well"	353	
Speak English less than "very well"	1,430	2.11%
Tagalog (incl. Filipino):	7,390	
Speak English "very well"	1,942	
Speak English less than "very well"	5,448	8.02%
Other Asian and Pacific Island languages:	15,641	
Speak English "very well"	4,227	
Speak English less than "very well"	11,414	16.81%
Arabic:	85	
Speak English "very well"	39	
Speak English less than "very well"	46	0.07%
Other and unspecified languages:	166	
Speak English "very well"	85	
Speak English less than "very well"	81	0.12%

Appendix E- Language Summary

Language Summary of Harbor's Community	Total	Speak English only or speak English "very well"	Speak English less than "very well"
Population 5 years and over	67,920	40,761	27,159
Speak only English	31,379	0	0
Speak a language other than English	36,541	9,382	27,159
SPEAK A LANGUAGE OTHER THAN ENGLISH			
Spanish	700	516	184
5 to 17 years old	52	52	0
18 to 64 years old	612	437	175
65 years old and over	36	27	9
Other Indo-European languages	483	397	86
5 to 17 years old	36	36	0
18 to 64 years old	374	304	70
65 years old and over	73	57	16
Asian and Pacific Island languages	35,107	8,345	26,762
5 to 17 years old	3,843	1,309	2,534
18 to 64 years old	23,724	6,164	17,560
65 years old and over	7,540	872	6,668
Other languages	251	124	127
5 to 17 years old	14	0	14
18 to 64 years old	211	98	113
65 years old and over	26	26	0
CITIZENS 18 YEARS AND OVER			
All citizens 18 years old and over	47,489	32,541	14,948
Speak only English	25,883	0	0
Speak a language other than English	21,606	6,658	14,948
Spanish	558	417	141
Other languages	21,048	6,241	14,807

APPENDIX G
LITERATURE REVIEW SUMMARIES

Document Title ***2010 Master Plan for Honolulu Harbor (MPHH)***
Prepared by Hawai'i Department of Transportation Harbors Division
Prepared for Hawai'i Department of Transportation Harbors Division
Publication Date: 1986

Source N/A

APA Citation Hawai'i Department of Transportation Harbors Division. (1986). 2010 Master Plan for Honolulu Harbor (Rep.). Honolulu, Hawai'i.

Summary

The MPHH identifies issues/needs and recommendations for the Honolulu Harbor. The Plan focuses primarily on maritime development. However, it does provide recommendations for non-maritime development as well. The MPHH provides an evaluation of actions taken to achieve the recommendations identified in the previous 1995 MP. The evaluation accounts for influences/factors that affected the implementation of recommendations from the 1995 MP.

The 2010 MPHH identifies 14 issues/needs including:

1. Cover Overseas Cargo
2. Overseas and Inter-island Passengers
3. Inter-island Cargo
4. Ferry
5. Unimproved Waterfront Areas
6. Bulk Fuel Storage/Transmission Pipelines
7. Downtown Interface
8. Commercial Fishing
9. Local Cruise Boats
10. Maritime Industrial Lands/Food Distribution Center
11. Other Land Use on Sand Island
12. Ship Repair Facility
13. General Cargo
14. Barbers Point Deep Draft Harbor

Recommendations are categorized into general and specific. General recommendations are provided for facilities, back-up, and piers. Specific recommendations are provided for piers, harbor properties, and site specific programming.

Key Sections / Chapters

- Background (Pg. 1) – Evaluation of actions taken to attain recommendations from the previous 1995 MP
- Summary of Discussions (Pg. 7)
- Conclusions and Recommendations (Pg. 16)

Lessons Learned	The MPHH provides an evaluation of the actions taken to achieve the recommendations identified in the previous 1995 MP. This is a valuable exercise to measure successes as well as be aware of potential influences/factors that may affect the recommendations developed in the 2050 HHMP.
Topic	Master Plan

Document Title ***Honolulu Waterfront Master Plan (HWMP)***
Prepared by Helber, Hastert & Kimura, Planners and R. M. Towill Corporation
Prepared for The Office of State Planning, State of Hawaii
Publication Date: 1989

Source N/A

APA Citation Helber, Hastert & Kimura, & R.M. Towill Corporation. (1989). Honolulu Waterfront Master Plan (Rep.). Honolulu, Hawai'i: The Office of State Planning, State of Hawai'i.

Summary The HWMP provides a comprehensive and integrated long-range vision for the Honolulu waterfront. The Plan balances the importance of maritime and non-maritime development by addressing the need to support the Port and also provide recreational/cultural/economic opportunities for a growing population.

Chapter 1: Introduction
This chapter provides an overview of the planning process including background information, organization, scope of work, and timetable.

Chapter 2: Description of the Planning Area
This chapter provides detailed site analysis on land tenure, opportunities/constraints, regional infrastructure (water, wastewater and drainage), jurisdictional controls, and historical land uses. Also included are brief summaries of other major planning documents relevant to the waterfront.

Chapter 3: The Master Plan
This chapter provides an overview of the framework/goals that guided the formation of the HWMP, long-range vision, and development plans.

- The framework/goals guiding the formation of the HWMP include physical (land use, urban design, circulation, infrastructure, environmental, phasing), economic (existing/future operations, financing, implementation/operational opportunities, and phasing), and social (employment, housing, development impacts, and phasing).
- The long-range vision adopts the Governor John D. Waihee III's challenge to create a "people-oriented gathering place" while also providing sufficient land/facilities for projected expansion of maritime operations within the waterfront. The vision includes restoring mauka/makai relationships, implementing a system of connected parks or the "lei of green", and preserving/enhancing Port operations.
- Recommended development plans are organize in two phases, the

short- and long- range plans. The short-range plan identifies priorities for the next five to ten years. The long-range plan identifies priorities for 2010 and beyond. Both development plans use functional planning design elements relating to maritime activities, economic/urban development, recreation/leisure and circulation.

Chapter 4: Financial Program

This chapter provides an overview of the projected public costs, estimated public revenues and financing alternatives/recommendations for the HWMP. Also included are case studies of financial, legal, and public policy considerations from waterfront development on the mainland. Key recommendations include:

- At the time the HWMP was written, the State had only used two financing mechanisms to pass costs directly to its users: assessment bonds for the special benefit portion of the urban development costs and harbor revenues bonds for maritime improvement. The HWMP recommends to diversify revenue streams to reduce dependency on general obligation bond financing, including:
    - Increase/broaden base of revenues which can be bondable by State agencies.
    - Coordinate with CCH to share revenues from increased property taxes from the waterfront.
    - Utilize ground lease rentals for pay-as-you-go financing, broadening revenue base of a public agency with existing bonding capabilities, or reimburse a revolving fund.
    - Adopt legislation to increase flexibility of spreading special assessments/levying special taxes on the basis of more general benefit.

Chapter 5: Implementation

This chapter provides an overview of the issues, problems and recommendations related to the implementation of the HWMP. Also included are case studies of mainland waterfront models of management structures. Key recommendations include:

- Establish a Waterfront Executive Committee (WEC) comprised of key agency directors to provide overall guidance and coordination of the HWMP. The WECs role/functions include:
    - Assist in establishing development priorities and monitor implementation of waterfront initiatives.
    - Coordinate budget requests for waterfront-related projects.
    - Resolve significant conflicts.
    - Recommend modifications to waterfront plan in response to changing conditions/events.
- OSP role/function:
    - Conduct periodic reviews/updates of MP.

- Coordinate interagency actions.
- POC for public.

- DOT-H role/function:
  - Augment staff capabilities in the area of property management, real estate development and finance.
  - User concerns raised during the preparation of the HWMP include:
    - Need for greater participation in the identification of harbor improvements.
    - Difficulty of present system to respond in a timely fashion to immediate/unprogrammed needs.
    - Addition of an advisory committee consisting mainly of port ysers for each of the commercial ports in Hawaii.
    - Addition of a Special Maintenance Fund that would allow DOT-H to respond quickly to unanticipated/urgent major maintenance and improvement projects.

Chapter 6: Environmental Assessment
This chapter provides an assessment of the environmental impacts associated with the HWMP.

Key Sections / Chapters

- Chapter 3: The Master Plan:
  - Section 3.3, Development Program
  - Section 3.4, Recommended Development Plans

Lessons Learned

Topic Master Plan

Document Title ***O'ahu Commercial Harbors 2020 Master Plan (OCHMP)***
Prepared by Hawai'i Department of Transportation Harbors Division
Prepared for Hawai'i Department of Transportation Harbors Division
Publication Date: 1997

Source https://hidot.hawaii.gov/harbors/files/2013/01/Oahu-2020-Master-Plan.pdf

APA Citation Hawai'i Department of Transportation Harbors Division. (1997). O'ahu Commercial Harbors 2020 Master Plan (Rep.). Honolulu, Hawai'i.

Summary

The OCHMP identifies alternatives and recommendations to improve maritime operations for the Honolulu, Kewalo Basin and Barbers Point harbors. The Plan focuses on maritime development in response to the growing spatial, facility and support requirements for ocean cargo carriers and the declining financial support for non-maritime development of harbor lands.

The OCHMP's 2020 vision for Honolulu Harbor includes a second entrance channel, four container terminals, an inter-island cargo terminal, liquid and dry bulk cargo facilities, neobulk and breakbulk cargo facilities, backlands and pier facilities for automobile shipments, a domestic fishing village, four cruise ship terminals, two ferry terminals, an excursion vessel terminal, a maritime office building, the Foreign Trade Zone "One Stop Shop", adequate berthing for the anticipated number and types of vessels and the necessary roadways to support the operations.

The OCHMP's 2020 vision for Kewalo Basin Harbor includes a gradual transition to ocean-based tourist activities with commercial fishing being relocated to Honolulu Harbor and Keehi Lagoon. Shoreside land uses will be developed by the Hawaii Community Development Authority (HCDA). The OCHMP's 2020 vision for Barbers Point Deep Draft Harbor include the expansion of the harbor with additional piers and yards to accommodate expanded cargo capacities. The deepening of the harbor and improving the entrance channel will be coordinated with the U.S. Army Corps of Engineers.

Chapter 2: Planning Objectives
The OCHMP supports the port system's primary mission for the development of safe, efficient, economically viable harbor facilities. The Plan covers maritime cargo handling (containerized, general, neobulk, dry and liquid bulk cargoes), passenger vessels (ferries, charter fishing boats, cruise and excursion ships), domestic and foreign commercial fishing, boat building/repair/maintenance operations, navigational concerns and other support facilities. The OCHMP's identified four planning objectives. The first is to plan the proper development of O'ahu's commercial harbors to support shipment of essential commodities. The second is to optimize the

usage of land and water resources committed to marine cargo, passenger and fishing operations. The third is to provide terminals and other support facilities to serve Hawai'i's port system. The fourth is to minimize the impacts to environmental quality and recreational opportunities.

Chapter 3: Economic Impact of Hawai'i's Port System

Hawai'i's port system is essential public infrastructure that supports the import and export of commodities that sustain Hawai'i's industries and the State's economy. Other topics in this chapter:

- Value of the Port System
  - Economic Activity
  - Employment
  - Economic Impact Analysis
- Hawai'i's Dependence on Commercial Harbor Activity
  - Commercial Harbor - Hawai'i's Primary Infrastructure
  - Harbor Development and Improvement

Chapter 4: Harbor History

This chapter includes the history of development for the Honolulu, Kewalo Basin, and Barbers Point harbors.

Chapter 5: Methodology

A task force was organized to identify problems, resolve conflicts and develop alternatives for the OCHMP. The task force included an executive committee, planning committee, and six sub-groups. The executive committee included DOT, DLNR, DBEDT, DOH, and B&F. The planning committee included chairpersons of the sub-groups and other key public and private organizations/entities with direct concern for the State's commercial harbors. The sub-groups included: ocean-based/navigation, terminal operators, other land-based operations, tourist-related operations, commercial fishing, and government agency. The sub-groups responsibilities included identifying needs and concerns for the development of the harbor. Other topics in this chapter:

- List of Issues/Needs Identified by Sub-Groups
- Refined List of Sub-Groups' 20 Issues/Needs by the Planning Committee
- Data Gathering
- 2020 Projections

Chapter 6: Planning Committee's Recommended 2020 Plan

The recommendations and alternatives are organized into the 20 identified issues/needs including:

1. Container cargo terminals
2. Berths
3. Roadways
4. Cruise passenger terminals

5. Honolulu Harbor Navigational Improvements & Traffic Flow
6. Barbers Point Harbor Expansion Project
7. Dry Bulk Cargo Terminals
8. Acquire Daishowa Area at Pier 40
9. Liquid Bulk Cargo Terminals
10. Automobile Cargo Terminals
11. Kewalo Basin Navigation Improvements
12. Excursion Passenger Terminal
13. General Cargo Terminals: Breakbulk, Lumber
14. Ship Building, Repair and Maintenance Facility
15. Domestic Fishing Village
16. Ferry Terminal
17. Foreign Garbage Disposal Facility
18. Maritime Office Building
19. Multi-Purpose Storage Area
20. One Stop Shop

Chapter 7: Maps
Includes maps of Honolulu, Kewalo Basin, and Barbers Point harbors.

Chapter 8: Financial Considerations
The implementation of the OCHMP was estimated to be $956 million (1996 dollars). OCHMP public and private projects are classified into three categories: basic infrastructure projects without revenue potential, capital projects with revenue potential, and potential public private partnerships. Alternative means to finance the plan were also identified, including commercial harbor user fees, commercial harbor rentals, Corps of Engineers, Federal Highway Administration, and private sector funds. Financing for projects will be determined based on project specific requirements.

Chapter 9: Environmental Considerations
Applicable environmental laws, rules, regulations and permits are identified.

Chapter 10: Acknowledgement of Participants
Includes participants for the OCHMP.

Appendices
- Appendix A: Glossary
- Appendix B: *Oahu Cargo Forecasts and Future Commercial Port Facility Requirements* (Parsons Brickerhoff Quade & Douglas, Inc. and Ogden Beeman and Associates, Inc., 1996)
- Appendix C: Preliminary Survey, Questionnaire, List of Interviewed Agencies

Key Sections / Chapters	• Section 6: Planning Committee's Recommended 2020 Plan
Lessons Learned	• Chapter 5, Section 4, C. 2020 Projections: o Unable to substantiate data for maritime tourist operations due to the lack of documented data and unwillingness of the bulk of the industry to share sensitive information. o For commercial fishing projections, it is difficult to project future quantities/locations of pelagic fish and therefore the size and space requirements of this industry. o Difficulty obtaining valid statewide socioeconomic data projections for 2020.
Topic	Master Plan

Document Title ***Statewide Cruise Facilities Study***
Prepared by Leo A. Daly
Prepared for Hawai‘i Department of Transportation Harbors Division
Publication Date: 1999

Source N/A

APA Citation Daly, Leo A. (1999). Statewide Cruise Facilities Study. Honolulu, Hawai‘i.

Summary

The Statewide Cruise Facilities Study assessed the passenger cruise industry, facilities, future growth and the economic contribution and cost to the State of Hawai‘i. The study also evaluates 12 established ports or prospective ports of call that potentially provide the most cost-effective investment.

Key Findings:

- There is substantial economic benefit from the passenger cruise industry to Hawai‘i.
- The cruise industry contributes economically through the expenditures of passengers and crew while visiting the islands and through operations of the cruise vessels. In 1998 the cruise industry contributed greater than $300 million and provided 2,900 jobs to Hawai‘i.
- There is a projected growth to 2020 and is expected to attract thousands of repeat tourists to the Islands (85% of the cruise passengers).
- In 1999, American Hawaii Cruises was the only domestic-registered deep sea cruise line in the United States and Honolulu is its homeport.
- Hawai‘i captures only 2% (in 9th place) of the North American cruise traffic in 1999 (See **Figure 2.1 North American Cruise Industry Market Share**). Popular destinations are in the Caribbean, Mexico, the South Pacific, Alaska and the U.S. West Coast.
- See **Figure S.1 Hawaii Cruise Market Passenger Projection** for estimates from 1998 to 2020.
- New terminal facilities are recommended for Pier 2 in Honolulu Harbor. Renovations and retrofits are recommended for commercial and small boat harbors on the Neighbor Islands.
- The cost-benefit analysis confirms that any investments made by the State facilities and infrastructure improvements require additional revenues beyond the current harbor fees.

Report Organization:

Chapter 1 – Introduction: summarizes the scope of services and the methodology used to complete the master plan report.

Chapter 2 – Market Analysis: assesses the potential market demand on a global scale and specifically for Hawaii as a destination.

Chapter 3 – Economic Benefit Analysis: evaluates and quantifies the economic benefit to the State of Hawaii and each island based on projected general excise taxes and income taxes; cumulative impacts based on DBEDT multipliers; passenger and crew spending and job creation.

Chapter 4 – Facilities Survey and Proposed Improvements: survey of existing conditions to determine facility needs and to recommend improvements.

Chapter 5 – Cost/Benefit Analysis: assessment of projected revenues and costs to determine the feasibility of specific improvements.

Chapter 6 – Funding Sources: summarizes project financing options from public and/or private sources.

Appendices

Drawings/Conceptual Plans:
Figure 4.2 to **4.6** Honolulu Harbor Pier 2 Scheme 1, 2, and 3 Diamond Head Cruise Terminal Conceptual Master/Floor Plan (December 1998)

Figure 4.7 to **4.8** Honolulu Harbor Piers 19/20 Conceptual Master/Floor Plan Phase 2 (December 1998)

Figure 4.9 to **4.10** Kahului Harbor Proposed Improvements Phase 1 and Conceptual Master Plan Phase 2 (December 1998)

Figure 4.11 Lahaina Harbor Proposed Improvements Phase 1 (December 1998)

Figure 4.12 to **4.13** Nawiliwili Harbor Proposed Improvements Pier 3 Phase 1 and Pier 2 Phase 2 (December 1998)

Figure 4.14 Port Allen Proposed Improvements Phase 2 (December 1998)

Figure 4.15 to **4.16** Hilo Harbor Proposed Improvements Phase 1 and 2 (December 1998)

Figure 4.17 Kawaihae Harbor Proposed Improvements (December 1998)

Figure 4.18 Kailua-Kona Small Boat Harbor Proposed Improvements Phase 1 (December 1998)

Figure 4.19 Kaunakakai Harbor Proposed Improvements (December 1998)

Figure 4.20 Manele Bay Small Boat Harbor Existing Facilities (December 1998)

Appendices
A – Economic Data
B – Cost Benefit Data
C – Acknowledgements
D – References

Topic Cruise Industry

Document Title ***Ship Navigation Study, Kalihi Channel Reopening, Honolulu Harbor, Oahu, Hawaii***
Prepared by Gary C. Lynch, José A. Sanchez
Prepared for U.S. Army Engineer District, Honolulu
Publication Date: 2001

Source N/A

APA Citation Lynch, Gary C. and Sanchez, José A. (2001). Ship Navigation Simulation Study, Kalihi Channel Reopening, Honolulu Harbor, Oahu, Hawaii. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/CHL TR-01-23.

Summary The researchers of the Ship Navigation Study had conducted a ship simulator from February 2000 to August 2000 to investigate the navigation and transit of the Kalihi Channel and the main Honolulu Channel for marine vessels. This study includes the channel and harbor layout, bathymetry, wind and bank forces, channel currents, design ships, and visual database for the existing and plan conditions.

Simulated test conditions:

- Licensed pilots validated the visual scenes, currents, wind and bank forces, and the ship handling characteristic for the simulations.
- Conditions were either the existing or plan.
- Two ships were used for existing and plan tests: Tanker and Containership.
- See **Table 2 Simulation Tests**.

Depth through the main harbor remained the same except for the Kalihi Channel. Under the simulated plan condition the depth of Kalihi Channel was increased from 10.973 m (36 ft) to 13.716 m (45 ft). No considerable hydrodynamic differences were found between the existing conditions and the proposed scenario.

Results and Conclusions:
The test runs of the existing condition produced by the simulation were executed smoothly without problems. These results verify that the simulation produced similar type of transit which the pilots were accustomed (see **Plates 1-24** track plots). The test results of the plan conditions, which focus on the reopened Kalihi Channel, were generally successful (see **Plates 25-56**). However, there were a few minor concerns which includes:

a. On several transits the vessel (containership or tanker) seemed to run too far down into the Emergency Turning Basin before beginning its turn.
    - Most likely due to the docked containerships on the northern or right side of the harbor. Pilots stayed to the left to give

room for the vessels.

b. Several transits showed signs of "ping-ponging" or swerving from side to side down the channel.
   - Same problem as the first concern (a).

c. Several transits showed problems with the entrance into Kalihi Channel (i.e., cutting through part of the recognized channel line.
   - This could be addressed by giving pilots a visual cue with a sea buoy in line with the channel (see **Figure 20**).
   - Second way to address this issue would be to dredge a flare in the first part of the channel, ¼ of the channel length (see **Figure 21**).

Barges used in Honolulu Harbor for interisland commerce (**Figure 22**) were beyond the capabilities of the simulator for more than one barge and would be no more deterministic in the channel design than the two vessels already available. Barge simulation was removed from testing.

The most significant result from the reopening the Kalihi Channel is improved flow of traffic for the harbor and reduced transit time. The time saved between an incoming vessel arriving and docking with only the main channel open and two vessels using the harbor simultaneously with both channels open could be approximately 1 hour.

Plates and Figures

Plates (1-56):

Plates 1-56 are track plots compilation of several of the features ship icon that were plotted every 25 seconds and features were recorded every 5 seconds.

First plate in each group shows a composite of all the runs made for that particular set of conditions; each plate after shows the individual runs.

Plates 1-24 shows the track plots of tests using the existing main harbor entrance channel.
Plates 1-7: containership, inbound to Sealand Terminal
Plates 8-13: containership, outbound from Sealand Terminal
Plates 14-16: containership, inbound to Matson Terminal
Plate 17: containership, outbound from Matson Terminal
Plates 18-21: tanker, inbound to Sealand Terminal
Plates 22-24: tanker, outbound from Sealand Terminal

Plates 25-56 shows the track plots of tests using the plan conditions with the reopened Kalihi Channel.
Plates 25-29: containership, outbound from Sealand Terminal
Plates 30-33: tanker, inbound to Sealand Terminal

Plates 34-38: tanker, outbound from Sealand Terminal
Plates 39-44: containership, inbound to Matson Terminal
Plates 45-47: containership, outbound from Matson Terminal
Plates 48-52: containership, entrance to Kalihi Channel
Plates 53-56: tanker, entrance to Kalihi Channel

Figures (1-26):

Figure 1 – Vicinity map.
Figure 2 – Sand Island Bridge.
Figure 3 – Honolulu Harbor.
- Use for visual scene reference location.

Figure 4 – CHL ship/tow simulator setup.
Figure 5 – Comparison of radar images.
- Typical ship radar display.

Figure 6 – Radar screen at 0.4-km (0.25-mile) range with tug visual.
- Vector on a screen showing tug placement and heading.

Figure 7 – Navigation parameters screen.
- Ship control console and the precision navigation screen.

Figure 8 – Numerical mesh (2005 elements, 5661 nodes).
Figure 9 – Elevation contour map.
Figure 10 – Water-surface elevation at offshore boundary.
- Predicted spring tide of January 17, 1999, at NOAA's station 1612340 in Honolulu Harbor.

Figure 11 – Material type distribution.
- Distribution over the mesh.

Figure 12 – Flow field at hour 122.5 (flood).
- Flood flow fields from the 144-hr long simulation.

Figure 13 – Flow field at hour 130.0 (ebb).
- Ebb flow fields from the 144-hr long simulation.

Figure 14 – Bank and wind force diagram.
- Bank and wind forces acting upon the superstructure of the vessel during transit.

Figure 15 – Areas of influence by reef and wind in the simulation.
- Coral reef in the adjacent area to the channel and the prevailing trade winds on the island.

Figure 16 – Docked vessels used for testing purposes.
Figure 17 – Cross sections defining area of vessel maneuverability.
Figure 18 – Simulator tanker bow image.
Figure 19 – Simulator containership bow image.
Figure 20 – Possible location of sea buoy for Kalihi Channel.
- Sea buoy in line with the Kalihi Channel.

Figure 21 – Possible flare option.
Figure 22 – Towboat with two barges in tow.
Figure 23 – Outbound traffic/inbound vessel waiting.
- Design tanker waiting for the design containership to clear

the harbor before it makes it entrance (delay time ~ 54 min.).

Figure 24 – Outbound vessel clearing harbor/inbound vessel docking.

- Tanker to dock at terminal once the containership has cleared the main channel (delay time ~ 54 min).

Figure 25 – Simultaneous inbound/outbound traffic.

- Same setup as Figure 23 but with the Kalihi Channel opened (delay time ~ 0 min).

Figure 26 – Other traffic considerations.

- A containership (or other vessel) departing and a barge and tow also need to depart while an incoming vessel is waiting to dock.

Topic Sand Island Bridge

Document Title ***Hawaii Harbor Users Group Report on Port Facilities & Development Priorities ("HHUG Report")***
Prepared by Mercator Transport Group (Mercator)
Prepared for Hawaii Harbor Users Group (HHUG)
Publication Date: 2005

Source Mercator Transport Group. (2005). Hawaii Harbor Users Group Report on Port Facilities and Development Priorities. Bellevue, Washington.

APA Citation Mercator Transport Group. (2005). Hawaii Harbor Users Group Report on Port Facilities & Development Priorities. Bellevue, Washington.

Summary

The purpose of the HHUG Report was to define the collective needs and priorities of harbor users and develop a plan for promoting development that satisfies those needs. In response to the increase of cruise ship traffic, the introduction of the inter-island ferry service and the continued growth in the transportation of commodities and goods, the members of HHUG worked with Mercator to identify locations and causes of the most critical port capacity shortages and make short-term, medium-term and long-term recommendations to DOT-H, to assist in the planning and development of Hawaii's port facilities.

Methodology: The Mercator team met with key managers and executives from each of the HHUG companies; visited numerous port facilities on Oahu and Maui; obtained data from DOT-H; and utilized data from past professional experience working in the liner industry in Hawaii. HHUG companies included the following: Matson Navigation Company (Matson), Horizon Lines, LLC (Horizon), Young Brothers (YB)/Hawaiian Tug & Barge, Norwegian Cruise Line (NCL), Sause Bros., Inc. (Sause), Aloha Cargo Transport (ACT), McCabe Hamilton & Renny Co., Ltd., Hawaii Stevedores, Inc., Hawaii Superferry, Inc., Tesoro Hawaii Corporation, The Gas Company and Ameron Hawaii.

Chapter 3: Overview of Port Operations by Location
This chapter gives an overview of the principal users and key cargo being handled at the following harbors: Honolulu Harbor, Kalaeloa Barbers Point Harbor, Kahului Harbor, Hilo Harbor, Kawaihae Harbor, and Nawiliwili Harbor. Below is a summary of the then existing conditions and forecasts at the Honolulu Harbor:

Honolulu Harbor: Includes facilities for cargo of all types, passengers, ship repair and vessel services, with berths numbered 1-53. According to DOT-H wharfage database statistics, container traffic increased by approximately 4% each year from 1994-2004, primarily generated by Matson and Horizon; domestic and foreign container traffic was expected to increase. Passenger traffic also increased with compound average growth of approximately 9%

during 1994-2004; further growth was expected before eventual stabilization. The HHUG report analyzed port call statistics and berth occupancy for the terminal facilities from March 2004- March 2005. The utilization of Piers 10/11 was 35%. Pier 38 had a high occupancy rate because propane barges use the pier as a layberth. Piers 28/29 and 31/34 are have a moderate occupancy rate. Pier 39/40 was expected to have an overall daytime berth occupancy above 80%. It was noted that defining an acceptable maximum level of berth occupancy is difficult as it is dependent on location, "the type and size of vessels being served, the length of typical port stays, the feasibility and cost of stevedoring operations on nights and weekends, the degree of schedule coordination among users and the cost to users of waiting for a berth". However, "achieving a berth occupancy of 100% is neither possible or desirable because of the significant disruptions and transport system efficiency impacts that result".

*It was implied that improvements are needed in DOT-H wharfage database statistics, to consistently assess the volume of cargo flows going through the Honolulu harbor.

Chapter 4: New Activity to be Accommodated Within the Hawaiian Harbors System

This chapter outlined the existing increasing demands at the time and future projected growth within Hawaiian ports; the summary below focuses on the Honolulu harbor:

- It was expected that the cruise sector activity would increase in 2005/2006, and thus have an impacts on berthing requirements (a 50% increase in cruise vessel berth hours in Honolulu harbor), primarily due to two additional NCL vessels in Hawaii.
- Hawaii Superferry (HSF) planned to start service in March 2007.
- Pasha Hawaii Transport Lines' (PHTL) Ro-Ro service by its new 579' pure vehicle/truck carrier in 2005 and Matsons' pure Ro-Ro vessel in 2004 had an increase in berthing demand and cargo traffic within the terminals.
- ACT increased frequency of mainland barge sailings in 2004.
- Increase of construction activity led to an increase in sand and cement moving between the islands.
- Matson's new service to Guam, China and USWC in 2006 was anticipated to increase port calling at Honolulu harbor by Matson's largest vessels.
- YB's neighbor island container traffic was anticipated to increase to 18 barge loadings in 2005.
- Based on conservative 1994-2004 container traffic trends, container traffic volumes moving through Honolulu harbor from mainland/foreign ports were anticipated to increase by 27% in 2010, 66% in 2015 and 93% in 2020. An aggressive forecast, based on

container traffic trends between 2000-2004, anticipated container traffic to increase by 43% in 2010, 94% in 2015 and 165% in 2020.

Chapter 5: Key Operating and Capacity Issues for Hawaiian Harbors

This chapter highlights key issues at each Hawaiian Harbor, which were discussed in interviews with HHUG members' managers. The summary below focuses on the issues at the Honolulu harbor:

- Reduction of pier 1 (by an estimated 4 acres) container terminal which would decrease the capacity of the pier to handle international container shipments.
- A need of a bulk material barge unloading facility to handle the increase in sand shipments to the neighbor islands, due to the increase of construction demand.
- YB expressed a need for improved inter-island terminal facilities to accommodate the increase in YB's inter-island barge departures from Honolulu. YB needs additional and/or reconfiguration of current land area, another barge berth area and loading position areas for heavy lifting equipment.
- Matson and Horizon expressed a need for increased terminal areas and/or a purely wheeled operation instead of a mixed wheeled/grounded operation, to accommodate the quick delivery/short dwell time characteristics of the domestic cargo moving through Honolulu harbor.

Chapter 6: Overview of Harbor Improvement Spending During the Last 5 Years

This chapter lists development priorities as expressed in long-range plans alongside facility development and improvement projects undertaken within the last five years at each Hawaiian Harbor. The summary below focuses on the development priorities at the Honolulu Harbor:

- A summary and status of completion for projects identified in the *Oahu Commercial Harbors 2020 Master Plan* (1997) is provided.
- A summary and status of completion for the recommended projects for the Honolulu Harbor is provided.
- Projects undertaken from 1999-2003 in Honolulu harbor, totaled approximately $73.3 million; some of which were consistent with the above-mentioned 2020 Master Plan's recommendations.
- The 2020 Master Plan did not indicate priority for certain projects; therefore, it was posited that was an area of contention in deciding which projects should have been completed.
- Analysis on DOT-HAR's cash flow during 1999-2004 indicates that additional projects could have been undertaken.

Chapter 7: Development Priorities for the Hawaiian Port System

This chapter lists development projects that HHUG members think DOT-H

should prioritize; however, the project costs likely exceeded the available funds. The total costs of the short, medium and strategic long-term projects identified were estimated to be approximately $300 million. The below is a summary of the priority development projects at the Honolulu harbor:

- Bulk Cargo – Develop location for handling bulk shipments of sand arriving by barge. (medium-term)
- Container – Develop new container facilities for international and long-haul domestic container volumes. The Kapālama Military Reservation is identified as a preferred location to develop a new container facility. (strategic)
- Container – Preserve container handling capacity at Pier 1by limiting further loss of operational area to neighboring parcels or road reconstruction. (strategic)
- Container – Acquire DLNR property located makai of Sand Island Road and make it operationally part of the Sand Island terminals to provide relied for space constraints. (immediate)
- Container – Reroute Sand Island Access Road makai of DLNR property and incorporate DLNR property as part of the main Sand Island terminal operating area. (medium-term)
- Container – Reconfigure Sand Island Access Road in front of the terminals to increase truck queueing areas. (medium-term)
- Ferry – Complete berth and landside improvements at Piers 19 / 20 to facilitate service starting in 2007.
- Inter-Island Cargo – Develop the Daishowa property and incorporate into an improved inter-island cargo terminal with main container gate on Libby Street. Reinforce Pier 40E to create an additional barge loading position. (medium-term)

<u>Chapter 8: Financing Development Projects</u>

The estimated cost of the identified priority projects exceeds $600 million. Several strategies for alternatives financing scheme include the following:

- Increase rates for cargo wharfage and passenger (dis)embarkation
- Pursue mixed-use development to spread development costs.
- Introduction of private equity.

Other recommendations to acquire financing include the following:

- Consider increases in the wharfage rates to increase the cash flow available now and to build a reserve fund for future capital projects.

Key Sections / Chapters

- Chapter 5, 6, and 7

Topic

Master Plan

Document Title ***Sand Island Tunnel Reconnaissance Study***
Prepared by R. M. Towill Corporation
Prepared for U.S. Army Corps of Engineers
Publication Date: 2006

Source N/A

APA Citation R. M. Towill Corporation. (2006). Sand Island Tunnel Reconnaissance Study. Honolulu, Hawai‘i.

Summary

The study focuses on a second entry and exit point alternative to Honolulu Harbor by reopening the Kalihi Channel that will increase harbor efficiency and safety. The bascule bridge over the Kalihi Channel was fixed in 1988 to allow continuous flow of traffic to and from Sand Island, which blocks vessel entry and exit from the harbor. The study had determined the most economically feasible tunnel alignment and location across Kalihi Channel to replace the existing twin bridges along the Sand Island Parkway. This study had identified all significant cost factors for the proposed alignment, profile, construction and construction method, and environmental studies that should be undertaken in the future. The study also includes a separate report for the requirements of the development of a high clearance bridge as another alternative, which is provided in **Appendix E**.

Conceptual plans were developed based on the immersed tunnel construction method and alignment mauka of the existing bridge (see **Appendix F**). This alternative was one out of three preliminary alternatives that was chosen by the State Department of Transportation to develop the conceptual plans. Total estimated cost of the project, in 2006 based on the economic analysis, was $275 million and the value of the project was estimated to be $300 million.

Section 1, Related Studies:
Honolulu Waterfront Master Plan prepared by the State in 1989, altered existing commercial harbor plans to enhance the oceanfront from downtown to the reef runway. Many recommendations were not implemented due to increased demand for ocean cargo and declining support for non-maritime development.

Oahu Commercial Harbors 2020 Master Plan, prepared by the State, used current economic indicators to plan the infrastructure required and recommends necessary port and harbor facility improvements.

Honolulu Harbor Improvement Study, prepared by HED for DOT-H, was terminated due to unfavorable benefit to cost ratio. This study included a ship simulation by the U.S. Army Corps of Engineers, Engineering

Research and Development Center. Potential improvements that were considered are deepening the Kalihi Channel to (-) 45 feet, widening the channel to 400 feet, dredging 100 feet inland, and lengthening two bends within the channel.

Section 2, Existing Conditions:
The operational areas of the main harbor basin have an average depth of 40 feet and the Kapalama Basin has an authorized depth of 40 feet. The Main Channel is approximately 500 feet wide and is maintained at a depth of 45 feet. Kapalama Channel is approximately 500 feet wide and is maintained at a depth of 40 feet.

Kalihi Channel has a top width of approximately 700 feet. Submarine shelves, at an elevation of (-)10 feet msl, encroach into the channel approximately 40 to 60 feet from the Sand Island shoreline and 130 to 210 feet from the Kapalama shoreline to form a 250-feet wide central channel that extends to a maintained depth of approximately 40 feet.

Sand Island Parkway is a 2-way, 4-lane divided urban arterial and the bridge crossing is approximately 700 feet long. The road grade ranges from approximately 0.40% to 1.0% and has a horizontal curve radii range from 500 feet to greater than 600 feet (See **Appendix D** for Traffic Evaluation). Restricted airspace begins from an elevation of 163 feet mean sea level (See **Appendix E** for the restricted airspace). There are overhead and underground utility lines crossing the Kalihi Channel (See **Section 2.5** and **5.4** for details).

Section 3, Preliminary Criteria:
Section 3.3 covers the criteria that are the basis for development of the alternatives.

Section 4, Preliminary Alternatives:
Tunnel construction alternatives are provided in **Appendix A**. Three construction methods were considered: Open Cut-and-Cover, Immersed Tunnel, and Shield Tunnel Boring Machine. Three Horizontal Alignment Concepts were considered: Concept A (Existing) Alignment, Concept B (Makai) Alignment, and Concept C (Mauka) Alignment (See **Figure 4-1**). Vertical alignment is dependent on the construction methods. Both the bored and immersed tunnel methods for the approaches will be open U-shaped boxes approximately 600 feet long and depth of 300 feet (see **Section 4.1.3** for details). Three Tunnel Section Concepts were considered that incorporated two 12-foot wide lanes in each direction, a 16.5 foot height clearance, 10-foot wide shoulder to each outside lane, 5-foot wide shoulder adjacent to each inside lane, 6-foot wide pedestrian sidewalks, and 5-foot wide bike lanes in each direction (See **Figure 4-2**).

From these, three preliminary alternatives were developed:

1. Alternative 1 – Concept C (mauka) alignment, bored tunnel
2. Alternative 2 – Concept C (mauka) alignment, immersed tunnel
3. Alternative 3 – Concept B (makai) alignment, immersed tunnel

Alternative 2 was chosen as the preferred alternative for the conceptual plans. Concept A was determined to be infeasible due to the need to construct a temporary highway and bridge to maintain access.

Section 5, Evaluation of Preferred Alternative:
This section covers the conceptual plan, right-of-way, transportation, infrastructure, construction, environmental, and economic considerations for the preferred alternative. Conceptual site plan is shown on **Figure 5-1**, tunnel profile is shown on **Figure 5-2**, and tunnel section is shown on **Figure 5-3**.

Five sub-alternatives were developed based from Alternative 2 immersed tunnel methods (IMT):

1. Alternative 2A – Single shell concrete IMT in open trench
2. Alternative 2A – Single shell concrete IMT in supported trench
3. Alternative 2B – Single shell steel IMT in open trench
4. Alternative 2B – Single shell steel IMT in supported trench
5. Alternative 2C – Double shell steel IMT in open trench

Alternative 2A was chosen as the most economically feasible valued at $165 million (open trench) to $175 million (supported trench). If land becomes an issue, then the supported trench will be more desirable. The temporary land required for the open trench would need 12 acres while the supported trench would require 5.5 acres. The conceptual plans are based on the Alternative 2A in a supported trench.

Alternative Conclusion:
Alternative 2A is the most economically feasible option. Land acquisition may be needed from the Post Office and Servco Pacific Inc. Utility easement will be required for the Fort DeRussy force main and replacement of the 12-inch and 16-inch water mains. One business will need to be relocated and six buildings need to be demolished (see **Section 5.2.3**). Design speed of the tunnel will be 60 miles per hour. Pedestrian and bicycle access was removed from the design due to additional cost, but pedestrian access will be limited to 3-foot wide walkway for emergencies. Ventilation will be provided to accommodate the transportation of hazardous materials through the tunnel. Utility systems and lines will need to be rerouted through the tunnel. Blasting will be required for the construction of the tunnel.

The high clearance bridge was determined to be infeasible due to the long approach and visual impact. The bridge would have a 7% slope and span 400 feet. The top surface elevation is at 146 feet and 142 feet at the abutments. Clearance beneath the bridge would be 138 feet at the center and 128 feet at the abutments.

Appendices:
Appendix A, Tunnel Engineering Report
Appendix B, Evaluation of Channel Currents
Appendix C, Geotechnical Report
Appendix D, Traffic Evaluation
Appendix E, High Bridge Feasibility Report
Appendix F, Conceptual Plans
Appendix G, Environmental Issues Report
Appendix H, Cost Estimate
Appendix I, Economic Analysis Report

Topic Sand Island Bridge: Second Harbor Entrance/Exit Alternative

Document Title ***Hawai'i 2050 Sustainability Plan: Charting a Course for Hawai'i's Sustainable Future (HSP)***

Prepared by Hawai'i 2050 Sustainability Task Force.
Prepared for State of Hawaii.
Publication Date: 2008.

Source http://www.oahumpo.org/wp-content/uploads/2013/02/Hawaii2050_Plan_FINAL.pdf

APA Citation Hawai'i 2050 Sustainability Task Force. (2008). Hawai'i 2050 Sustainability Plan: Charting a Course for Hawai'i's Sustainable Future. (Rep.). Honolulu, Hawai'i: State of Hawa'i.

Summary The HSP is a long-range sustainability plan that builds upon the Hawai'i State Plan. The Plan provides a definition, vision, and principles for sustainability in Hawai'i. To achieve long-term sustainability, the HSP identifies goals, strategic actions, and indicators that support the Triple Bottom Line Approach by balancing economic, community and environmental goals.

The five goals and strategic actions for Hawai'i 2050:

- Goal 1. A Way of Life - Living sustainably is part of our daily practice in Hawai'i. Strategic actions include:
  1. Develop a sustainability ethic.
  2. Conduct ongoing forums and cross-sector dialogue to promote collaboration and progress on achieving Hawai'i's sustainability goals.
  3. Continually monitor trends and conditions in Hawai'i's economy, society and natural systems.

- Goal 2. The Economy - Our diversified and globally competitive economy enables us to meaningfully live, work and play in Hawai'i. Strategic actions include:
  1. Develop a more diverse and resilient economy.
  2. Support building blocks for economic stability and sustainability.
  3. Increase the competitiveness of Hawai'i's workforce.
  4. Identify, prioritize and fund infrastructure "crisis points" that need fixing.

- Goal 3. Environment and Natural Resources - Our natural resources are responsibly and respectfully used, replenished and preserved for future generations. Strategic actions include:
  1. Reduce reliance on fossil (carbon-based) fuels.
  2. Conserve water and ensure adequate water supply.

3. Increase recycling, reuse and waste reduction strategies.
4. Provide greater protection for air, and land-, fresh water- and ocean-based habitats.
5. Conserve agricultural, open space and conservation lands and resources.
6. Research and strengthen management initiatives to respond to rising sea levels, coastal hazards, erosion and other natural hazards.
7. Develop a comprehensive environmental mapping and measurement system to evaluate the overall health and status of Hawai'i's natural ecosystems.

- Goal 4. Community and Social Well-Being - Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need.
  1. Strengthen social safety nets.
  2. Improve public transportation infrastructure and alternatives.
  3. Strengthen public education.
  4. Provide access to diverse recreational facilities and opportunities.

- Goal 5. Kanaka Maoli and Island Values - Our Kanaka Maoli and island cultures and values are thriving and perpetuated.
  1. Honor Kanaka Maoli culture and heritage.
  2. Celebrate our cultural diversity and island way of life.
  3. Enable Kanaka Maoli and others to pursue traditional Kanaka Maoli lifestyles and practices.
  4. Provide support for subsistence-based businesses and economies.

Key Sections / Chapters
- Executive Summary

Topic Statewide Plan

Document Title ***Hawai'i Tourism Authority (HTA) Hawai'i Cruise Industry Study: Modules 1-9 (2008)***
Prepared by ICF International, Charlier Associates, Inc., Menlo Consulting Group, Inc., John M. Knox & Associates, Inc., Pacific Legacy, Inc., Harbour Mastery® Inc., and FAQ Hawai'i, Inc.
Prepared for State of Hawai'i, Hawai'i Tourism Authority
Publication Date: 2008

Source Various

APA Citation

Hawai'i Tourism Authority. (2008). Hawai'i Cruise Industry Study: Module 1-Assessment of Cruise Industry. Honolulu, Hawai'i.

Hawai'i Tourism Authority. (2008). Hawai'i Cruise Industry Study: Module 2- Assessment of Hawai'i's Cruise Industry. Honolulu, Hawai'i.

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Summary

Module 1-Assessment of Cruise Industry

Module 1 provides an overview of the cruise industry and key forces that shaped its development, outlook, contingency plans for disasters, and a comparative analysis of relevant issues and key trends in five port destinations with significant cruise tourism. This module also addresses the evolution, growth, technological and security-related changes of the cruise industry and the impact on port communities.

Major industry players in 2006:

Carnival Corporation, Royal Caribbean, and Star Cruises; each represent multiple cruise brands (See **Figure 1. Ownership Structure of Selected Cruise Lines**).

NCL America, part of Star Cruises, is the only major U.S.-flagged cruise line.

Pride of America will be the only large U.S.-flagged cruise ship in the world.

Trends:

- Passenger Growth – Primary and overarching trend. Most of the growth has originated in the U.S., which dominates the world market for cruising.
- New Ships – to meet heavy demand.
- Bigger Vessels – Cruise lines are building “mega ships” with capacities far more than 2,500 passengers. Require longer berthing area, stronger pier infrastructure, and a deeper draft.
- New Destinations – Most popular destination for American travelers is the Caribbean (49%), Mexico (24.8%), Alaska (16.1%), Canada (7.2%), and Hawai‘i (7%). New destinations are focused towards Europe, South Pacific, Asia, South America, and the Arabian Gulf.
- New Source Markets – Biggest passenger market in order of biggest to smallest: United States, United Kingdom, Germany, Italy, France, and Spain. Growing source markets include Canada, Mexico, Latin American countries, and countries in Asia.

Outlook:

North American cruise passengers could number 17.2 million by 2020.

Global scale, world cruise passenger aggregate is expected to approximate 27 million by 2020.

Cruise Ship Technology and Port Infrastructure:
Cruise lines must follow international, port state, and U.S. state standards. Some cruise ship owners have made investments in special onboard equipment (e.g. Alaska Marine Exchange).

Contingency Planning:
This report had discussed several ways local governments can make preparations for disasters and response to emergencies (See **Table 4. Local Community Considerations for a Mass Rescue Operation**).

Comparative Port Analysis:
The five ports selected for the study were Juneau, Alaska; Seattle, Washington; St. Thomas, U.S. Virgin Islands; Bridgetown, Barbados; and Puerto Vallarta, Mexico (See **Table 1. Summary of Comparative Port Key Issues**).

Module 2- Assessment of Hawai'i's Cruise Industry
Module 2 is an overview of the history, development, environment, and future outlook for the cruise industry in Hawai'i. This Module provides an overview of Hawai'i historical perspective, cruising development, cruise visitors, visitors points of origin, demographic characteristics, visitors expenditure patterns, and outlook. It also provides international, national, state, and local regulations that affect Hawai'i cruise industry.

Profile of Visitors and expenditures (2006 data):
- Origin – Vast majority of out-of-state visitors were from the U.S. mainland (83.7%). Most important state for cruise visitors to Hawai'i is California (23% of the U.S. mainland visitors).
- Experience with Hawai'i –Out-of-state repeat visitors represents 58.8% and first-time visitors with 41.2%.
- Demographics – Cruisers tend to be older for about 61.3% out-of-state cruise visitors were age 50 or older. More than half (55%) of cruise visitors were female. See **Table 6. Age of Hawai'i Cruise Visitors (2006).** See also **Table 7. Demographic Profile of Past and Potential Cruise Visitors to Hawai'i.**
- Trip length – Out-of-state visitors spend on average 9.75 days in Hawai'i with 6.25 of the days are spent on a cruise ship (see **Table 8. Hawai'i Cruise Visitor Length of Stay, by Point of Origin).**
- Expenditures – Out-of-state cruise ship visitors spend an average of $210.62 per person per day (see **Table 9. 2006 Hawai'i Cruise Visitor Spending Per Person per Day, by Point of Origin).**

Outlook and Projections:

MCG data reveal that 71.3% of U.S. mainland travelers are extremely or very interested in visiting Hawai‘i, but visiting by cruise to Hawai‘i is less than other appealing places to travel by cruise (See **Table 10. Most Appealing Place for Next Cruise among Past Cruisers**). However, the level of interest in visiting Hawai‘i has remained relatively constant since 1989. Passenger volume is expected to have a growth rate of 1.29% for 2009-2018. See **Figure 16. Actual and Projected Total Hawai‘i Cruise Passenger Volume (1996 to 2018)** and **Table 13. Projected Hawai‘i Cruise Passenger Volume—Mid Growth (2008 to 2018).**

See **Section 5, 6,** and **7** for regulations and practices.

Module 3—Impact on the Economy

Module 3 estimates the economic impact of the cruise industry on the Hawai‘i economy using the REMI model to model the local and regional economic impacts of cruise passenger, cruise line, and crew member spending as well as associated taxes collected by the state and counties. The study relies on broad cruise industry trends identified and analyzed in other modules of this project to determine the historical trends in the Hawai‘i cruise industry activities. It then uses data collected from cruise line and crew member surveys conducted under this study to estimate the current incremental impacts as well as future trends attributable to the Hawai‘i cruise industry.

Conclusions (2007):

- Gross Regional Product (GRP) – In 2007, there is a 1.56% growth over cruise baseline. Hawai‘i cruise industry added close a billion dollars ($973 million) to the gross regional product.
- Employment – Cruise industry supported about 17,000 jobs in the Hawai‘i economy (1.98% growth over the baseline).
- Disposable Income – estimated to grow about $435 million in 2007.
- Taxes – Cruise industry in Hawai‘i have generated substantial tax revenue for the state and local government ($110 million).
- Trend for GRP, Employment, and disposable income is expected to drop post-2007 and then have a moderate growth (see **Table 15: Summary of Results**).

Module 4—Impact on Infrastructure and Government Services Part A: Harbor and Port Facilities

This module focuses on the cruise industry impact on infrastructure ports and harbors. The module examined existing infrastructure (in 2008), demands on infrastructure (in 2008), and future expected demands on Hawai‘i Harbors, the Hawai‘i Harbors Modernization Plan, and future impact of the cruise industry after modernization. Nine harbors were studied (6 of which are DOT-H commercial harbors and 3 were DLNR Boating and Ocean Recreation Small Boat Harbors).

See **Section 11.4, Findings for Each Harbor**, for detailed impact analysis for Kahului, Nāwiliwili, and Hilo Harbor.

Conclusions:
In 2008, harbors revenue has increased as a result of increased harbor traffic; however tariffs have not been able to match the increase costs of operations and maintenance. Key cruise impacts are related to government services, harbor usage and waterside infrastructure, pier and terminal facilities, and landside access management. Projected future impacts on Harbor and Port may greatly decline (48%) cruise vessels call from the withdrawal of two NCL America home-ported vessels in the beginning of 2008. Harbor modernizations were planned between 2008 and 2014.

Identified future improvements for harbors and port infrastructure include the need for tariff increases, the conflicts in scheduling and shared use of facilities, coexistence of commercial, environmental and community needs and priorities, and response to increasing Homeland Security and FEMA requirements are all managed in other ways.

Module 4—Impact on Infrastructure and Government Services Part B: Public Roads, Streets, and Highways
This module quantifies the impacts of the cruise industry on public roads, streets and highways surrounding each port. The first section of this module covers port profiles which include roadway facilities; access and traffic flow; bus, taxi and shuttle infrastructure; rental cars and parking; pedestrian and bicycle facilities; and other facilities and general observations. The second section outlines the methodology. The methodology section analyzes cruise ship passengers forecast, vehicle trips, existing background traffic (2008) and projection through 2018, and quantifies impacts on the transportation network.

Ports examined are *Nāwiliwili Harbor, Port Allen, Kikiaola, Kahului*, *Lahaina, Hilo, Kawaihae, Honolulu–Pier 10/11*, and *Honolulu–Pier 2.*

Key Findings:
- Roadway Capacity - Level of Service are expected to remain the same with the addition of cruise passengers through 2018.
- Transit – Cruise ship passengers on transits is expected to decline.
- Air – Majority of cruise ship passengers fly to Hawai‘i to begin their cruise; however the number of passengers represents a small percentage of all passengers and the cruise industry impact is not expected to be significant.

Module 4—Impact on Infrastructure and Government Services Part C: Community Infrastructure

Module 4 Part C examines the impact of the cruise industry on community infrastructure in Hawai‘i. This module provides existing and anticipated demands on municipal infrastructure by cruise passengers, crew onshore, and cruise ships in port.

Key Findings:

- Utilities – See **Tables A-I**, for projected cruise ship and onshore cruise passengers and crew utility demands from 2007 through 2018.
- Health Care Systems – There are no increase in demands for ER visits from cruise ships.
- Police Services – There are no evidence cruisers are responsible for the amount of crime in any county. An officer is generally dispatched when a ship is in port to manage traffic. Kaua‘i may have strains on their police department resources if the number of nights cruise ships are docked increases.
- Fire Services – There were no substantial increase in fire department’s workload from cruise ships.
- Emergency Services – EMS providers do not track where the individuals involved in incidents are from. There were no impressions when days are busier when ships were in port.
- Air Transportation System – Most passengers on foreign-flagged ships generally do not have interaction with the air transportation system. Domestic-flagged ship passengers generally fly in to Hawai‘i to begin and end their cruise.
- Visitors and Convention Bureau – Cruise passengers comprise a small percentage of all visitors assisted by the bureaus and have minimal use for the physical Visitors Bureau offices.
- Visitor Assistance Programs – In 2007, 1 to 2% of all VASH for O’ahu cases were cruise passenger-related, 10 to 11% of West Hawai‘i and up to one third for East Hawai‘i. Significant future impacts are not expected for any growth.

Cruise passengers and crew only use a small portion of municipal utilities compared to residents and other tourists.

Module 5—Impact on the Environment Part A: Marine Environment

This module defines the impacts on the marine environment caused by the operation of the cruise industry in Hawai‘i. The study has five objectives that could which include 1) describing the marine natural resources that could be impacted by the cruise ship industry operations, 2) the cruise passengers activities that could potentially impact marine resources, 3) identifying planned port/harbor/anchorage improvements, 4) identifying cruise ship operations that could adversely impact marine resources, and 5) evaluating marine impacts.

Key Findings:

- Impacts from Cruise Vessel Operations – The observed cruise vessels have sufficient mitigation measures to avoid significant impacts to the marine resources. However, in the area of Lahaina and Kailua-Kona, chain sweep at anchorage areas have damage and destroyed live coral bottoms.
- Impacts from Cruise Passenger Activities – Cruise passengers account for a small percentage of all visitors to Hawai‘i and would therefore also represents a small percentage of the total visitors impact to environmental resources. In some particular locations (e.g. Kahaluu Beach near Kona and the beach at Nāwiliwili) there are issues with overloading sensitive resources by cruise passengers.
- Impacts from Proposed Improvements to Commercial Harbors – The main impact to marine resources from development would be loss of corals from dredging and pier construction activities.

See **Table 6. Cruise Ship Industry Impacts** and **Table 7. Summary of Releases to the Marine Environment from Cruise Vessels.**

Module 5—Impact on the Environment Part B: Air Quality

In this analysis, the study team used air quality modeling to estimate the "worst case" ambient air quality resulting from air emissions from cruise ships at six ports (Hilo, Honolulu, Kahulu‘i, Kailua-Kona, Lahaina, and Nāwiliwili) in Hawai‘i and compared these concentrations to health-based air quality standards. In addition, the study team monetized estimated cruise ship emission impacts and those impacts as economic costs for each port in Hawai‘i.

See **Table 4. Assumed Emission Factors (g per kilowatt-hour) for Cruise Vessels at Hawai‘i's Ports.**

Conclusions:

Ambient air pollutants from the cruise industry at the ports have the potential to reach levels above state and federal limits under "worst-case" conditions for $PM_{2.5}$, PM_{10} and NO_2. At the same time, air emissions from cruise ships were estimated to cause relatively low economic damage on an annual basis due to Hawai‘i climate and geographic features. In 2007, the economic cost of air emissions from cruise ships in Hawai‘i's port are well below $20,000 per year statewide and is projected to be below $10,000 per year statewide through 2018.

See **Table 7** and **8,** for results of screening analysis for air pollutants with and without ambient background concentrations. See also **Table 22. Economic Value of Air Emission-Related Damages ($)**, for the screening analysis cost estimate at each port from 2007 through 2018.

Module 5—Impact on the Environment Part C: Impacts of Cruise

Passenger Onshore Activities

Module 5 focused on the potential environmental impacts associated with onshore cruise passenger activities mainly in Hawai‘i’s parks and natural areas. The module identifies the most popular sites and environmental impacts for O‘ahu, Maui, Hawai‘i Island, Kaua‘i.

Conclusions:

Environmental impacts associated with cruise passengers are the degradation of air quality from tour buses, soil erosion, littering, and general wear and tear on state and natural park trails. These impacts are generally minor and the potential significant cumulative impact is from emissions from diesel buses and rental cars used by cruise passengers.

See **Table 1. Estimated Economic Costs to Hawai‘i of PM Emissions from Diesel Tour Buses Used by Cruise Passengers ($ per annum)** and **Table 2. Total Emissions from Rental Cars Used by Cruise Passengers in 2007 (Pounds).**

Module 6—Impacts to Heritage Sites

Module 6 identified the heritage properties and frequency of visits by cruise passengers.

See **Table 1. Heritage Properties Promoted to Cruise Ship Passengers** and **Table 2. Heritage Destinations Offered as Part of On-Shore Excursions or Via Walking Tours.**

Conclusions:

Heritage properties are frequented by cruise passengers on tours as way-stops for a usual duration of approximately 30 minutes. There are no physical impacts on heritage sites other than the observed periodic surges of overcrowding when multiple tour buses are at the same locations. There are little economic benefits from the examined heritage sites. Cruise ship passengers level of impact identified during 2007 is projected to decrease by 50% and then increase by roughly 2.5% over the next 10 years (See **Table 7. Heritage Site Visitation Projections through 2018**).

Module 7—Cost-Benefit Analysis

Module 7 presented the cost-benefit analysis that estimated the net return of the cruise industry for the state and each island. This module integrates the impacts of the cruise industry on the economy, environment, airports, state parks, and vehicle trips. It also compares the projected benefits and costs of the cruise industry against a hypothetical scenario in which the cruise industry did not exist in Hawai‘i. This also includes the costs and benefits that would have been incurred if cruise visitors stayed in land-based accommodations in the absence of the cruise industry.

See **Figure 1: Components of Cost-Benefit Analysis**

Key Findings:

- Costs – The cruise industry imposes $345.3 million on average per year in costs to the state. The direct costs total to less than $3.3 million per year. Majority (99%) of the cost comes from unrealized Gross Regional Product
- (GRP) from cruise passengers for land-based accommodations.
- Benefits – The cruise industry provided $477.2 million on average per year in benefits to the state. More than 99% of the benefits stem from the increase in economic activity generated by the cruise industry measured by the GRP.
- Percentage of Cruise Passengers Who Would Visits as Land-Based Tourists – Based on the Travel Industry Association of America, leisure travelers are mostly influenced by the trip destinations before other decisions. This accounts for about 67% of leisure travelers. The study team assumes 67% of cruise passengers visiting Hawai‘i would still come to the islands as land-based tourists in the absence of the cruise industry and 33% are assumed to be exclusive cruisers and would not visit Hawai‘i.
- Net Benefit – There is an annual net benefit of $131.9 million to the state. On an island-by-island basis, Honolulu and Hawai‘i County experience a large net benefit from the cruise industry in all scenarios; whereas Kauai and Maui County have different levels of benefit from the cruise industry. This is based on the assumption of cruise passenger that would stay in land-based accommodations which Maui has a higher increase in GRP per land-based visitors and second highest volume of tourism from non-cruise tourists. See **Table 1: Net Present Value of the Cruise Industry by Island (in $ Thousands).**
- Taxes and Fees – Total tax revenues generated by the cruise industry in 2009 through 2018 are projected to be approximately $51.4 million on average per year. Direct cost imposed by the cruise industry over the same period is estimated to be approximately $3 million on average per year. The total direct taxes paid by the cruise industry outweigh the total direct costs by its presence in the State of Hawai‘i.

Module 8—Comparison with On-Shore Accommodations

Module 8 compares the economic and infrastructure impacts of 1,000 cruise ship cabins vs. 1,000 hotel rooms, both statewide and on a county-by-county basis. The study is based on 100% room/cabin occupancy by 2.0 people for a single day for both hotel and cruise. The studied impacts are based on four classes of economic benefits (economic output, resident employment [2005], resident earnings [2005] and government revenue) and five measures infrastructure uses (water, sewer, electricity, propane and solid waste) and is projected from 2007 to 2009. The results from this module can provide a guide for policymakers and planners to gauge the impacts of a

variety of situations including a general increase or decline in visitor counts, expected increase or reduction in cruise ship and passenger arrivals, and hotel openings or closings.

Conclusions:
The 1,000 hotel rooms generated both more economic benefit and also more infrastructure cost than the 1,000 cruise cabins on any one day. On the county level, the City and County of Honolulu had a greater economic benefit from the cruise visitors than the other counties due to the cruises that tended to stay longer on O‘ahu.

The City and County of Honolulu was the only county where cruise output exceeded hotel output. Mainly due to non-resident crew members that spent around $98 per day in Honolulu and cruise operational expenditures were also higher in Honolulu. See **Table 7. Statewide Economic Output Comparison** and **Table 8. City and County of Honolulu Economic Output Comparison.**

Resident Employment is expected to decline from 2007 to 2009 because foreign-flagged ships are expected to increase as a percentage of total crew-days in 2009. See **Table 15. Statewide Resident Employment Comparison.** Resident Earnings is expected to be significantly less than hotel because the cruise industry predominantly employs non-Hawai‘i residents.

Daily government revenues associated with 1,000 cruise cabins and 1,000 hotel rooms for the State and for each county are presented in **Tables 33** to **37.** Both cruise visitors and hotel visitors rent cars and participate in tours that bring revenues to the State and county government. State revenue from hotel ($86,102) in 2007 was 116% of that from cruise $74,100 and is projected to be 119% of cruise in 2009.

Module 9—Best Management Practices
This module identifies resources for emerging best practices, technologies and methods from comparison ports and other ports with issues similar to those confronted by the State of Hawai‘i harbors. There are eight (8) best practice focus areas and 24 best practice topics that were identified. These focus area include Tariff System Structures; Information Technology, Traffic and Tariff Management; Infrastructure Modernization; Modernization Financing; Security Management and Technologies; Environmental Impact and Energy; Cruise Industry Marketing; and Tourism Training and Community Relations.

See **Appendix 2** for list of studied ports and study resources.

Key Findings (2008 see **page i** to **ix**):

Tariff System Structures –

- Fees for standard services such as dockage, wharfage, and harbor entry trend higher than in Hawai‘i Ports.
- Port of Miami has established a basis for managing increases in tariffs embedded in policy.
- All ports studied have identified a way to pass on security-related fees as new federal and state requirements emerge.
- Self-reporting practice in cruise line agreements.
- Several comparison ports are using bundled fees for services to simplify billing and collections process.

Information Technology, Traffic and Tariff System Management –

- First-come, first-serve berthing scheduling procedures (already practiced in Hawai‘i).
- Maintaining and managing pubic published awareness of the most recent schedule changes.
- Window for changing vs. rescheduling (i.e. Tampa Port Authority’s 4-hour rule).
- Published policies for scheduling, berthing, and other services along with published tariff schedules for those services, establish the basis for all negotiations when changes occur (already in place in Hawai‘i).
- Choosing between upgrading IT legacy systems and adopting advanced systems.
- Migrating to a new system that takes advantage of advanced web-enabled technologies may offer a better long-term return on investment (ROI) than simply upgrading a legacy system (require training).
- Business analytics software solutions are available through reputable firms that migrate existing data into any new systems.
- Advanced systems offering auditing capacities in emerging ERP systems are enhanced by the Electronic Data Interchange (EDI), web-services connectivity to “databases of record” such as Lloyd’s Ships Register, data import/export, business analytics and reporting, role based user dashboards and access controls, and many other capabilities that traditional client/server applications do not offer. Best practice tries to avoid having to interface and integrate multiple disparate systems.

Infrastructure Modernization –

- The choice between redevelopment of cargo facilities and new construction of dedicated cruise facilities relates to existing architecture and location, and must balance a wide range of issues including security requirements, size of vessels, number of passengers, environmental risks, and passenger safety when located

in cargo operations zones. These issues are leading many ports to select the new construction alternative.

- New construction in the Hawai‘i context has to consider State regulations and zoning requirements. If those regulations do not prohibit a modern multi-purpose facility that leases space to vendors, boutiques, and restaurants and could accommodate community meetings and conferences, it could greatly benefit both cruise trade in the harbor and the local community.
- Where redevelopment or deferred development requires maintaining existing facilities, incremental improvements can continue to upgrade the cruise and passenger experience.
- Modern temporary facilities that are easily erected and disassembled for pier tendering situations where terminal construction is not desired can provide benefits both in service to the cruise industry and service to the community that uses those piers.
- The growth in vessel size and numbers of passengers they can accommodate affect the waterside infrastructure capacities of ports and harbors, as well as the landside spatial considerations for all of the amenities and transportation inter-connectivity that cruise passengers and cruise industry service providers expect. Improvements in the pier, bollard, and related infrastructure can take advantage of new engineering capabilities that require minimal alteration in the existing structures.
- Ports and harbors that experience a high level of commercial and cargo traffic relative to their size are adopting berthing strategies—including niche berths, floating piers, bridge access systems, and others—that depart from the traditional “vessel at the pier” terminal approach.
- Modern gangway and passenger bridge systems in seaports, like those in modern airports, increase the flexibility for terminal location and facilitate the separation of cruise passenger and crew activity from pier-level and vessel-servicing activity while meeting DHS security preferences for “total separation” of these activities.
- The publication by the port of its development plan is an important community relations practice to provide the general public with a high-level overview of the plan, why it exists, and how it is being implemented over time. This practice also helps objectify media interpretation of plans and expectations.
- Where external investment is involved, audits are generally required to insure the recovery of the investment. If advanced internal assessments follow these same procedures and processes immediately prior to the external audit, they may mitigate unexpected results and reduce the likelihood of serious abnormalities. The external assessment will then provide both an audit and validation of the internal findings.

- Integration of Graphical Survey Systems (GSS) and technologies such as satellite mapping and imagery combined with mobile asset tracking technologies and other geospatial analytics can benefit security as well as planning for future modernization and improvements, providing a greater ROI than if each technology was secured as a separate service.

Modernization Financing –

- Negotiated financial agreements (NFA) with cruise lines and terminal operators based on specific revenue capture objectives with each client are implemented by many ports (Minimum Annual Guarantee, Minimum Financial Guarantees, Preferential Use Agreement).
- The State of Hawai‘i Legislative Option.
- Public/Private Partnerships.
- Federal Financing Opportunities exist through U.S. agencies.
- The DOT MARAD MOU signed December 13, 2007, with The State of Hawai‘i Harbors Division offers the extraordinary advantage of a large array of technical, administrative, and fiscal resource access and management for the Hawai‘i Harbors Modernization Project (HHMP).

Security Management and Technologies –

- Automated Identification System (AIS), for tracking vessel locations within a 30-mile radius, and CCTV cameras.
- Next-generation vessel tracking technologies are extending AIS tracking though Long Range Identification Tracking (LRIT).
- Next-generation Internet Protocol digital camera systems with infrared night vision and other proprietary capabilities.
- In passenger terminals, facial recognition and behavioral software analytics may be integrated with camera surveillance technologies.
- Sophisticated underwater/above-water camera and sonar systems.
- Transportation Worker Identification Credentials (TWIC) cards (biometric and/or media metric authentication) are issued only after thorough background checks.
- Mobile marine vehicles and equipment asset tracking systems utilize GPS and/or Iridium cellular signals to provide location information.
- Interoperable communications systems that can integrate communications among radio, cellular, land phones, and voice over the Internet (VoIP).
- Databases of record provide data on vessels.
- Port Continuity of Business plans are federal security requirements that focus on the response to and recovery from a disaster that may come to a port.
- IT security systems with alternative energy supply systems.

- Small-vessel security.

Environmental Impact and Energy –

- Emission reduction and standards enforcement and federal pollution prevention.
- Green ports projects.
- Interim fuel costs mitigation strategies in the shipping industry relying on short-haul and max loads.
- Water quality management is moving toward EPA-recommended real-time monitoring and port-based real-time air quality monitoring.
- Aquatic invasive species control technologies are being developed in Hawai‘i and globally with new patented systems that use a combination of directly-treating ballast and graywater with ionization and deoxygenization, and mechanical and hand processes for direct removal of aquatic threats.
- Air quality audits can develop a comprehensive analysis by utilizing EPA port emissions inventories.
- Collaborative agreements with an awards system (i.e. Green Flag Awards in the Port of Los Angeles).
- Vessel shore-side power connectivity for cold ironing through the electric grid is being established in an increasing number of ports, and major shipping lines are responding by modifying their ships to use shore power.
- Alternative power for cold ironing (i.e. mobile truck-trailer-mounted LNG generators).
- Non-vessel vehicle and engine emissions have been identified by EPA as another major source of carbon emissions pollution.
- Solar photovoltaic solutions (i.e. Port of Los Angeles).
- Geothermal energy solutions in volcanic regions (i.e. Aleutian Island Chain in Alaska).
- Biodiesel and ethanol production projects in Hawai‘i parallel global efforts to grow non-carbon based fuel sources for vehicles and engines of all types.
- Advances in the disposition of recyclable and disposable materials by the cruise industry can be further enhanced by federal and state legislation for managing recyclables disposition from foreign vessels in U.S. ports.
- Old piers and pilings may be left in place when surrounded by PND Open Cell construction technology.
- Hawai‘i’s harbor jetties and breakwaters may offer an ideal location for location of wave energy capture stations.

Cruise Industry Marketing –

- Working closely with the cruise line association most related to an individual port market (i.e. Northwest CruiseShip Association is to

Hawai‘i).

- Expanding the solicitation of new cruise lines or additional vessels from existing cruise lines.
- Focusing the marketing concerns of destinations enables the focusing of marketing strategies for both new and existing destinations.
- Exploring every dimension of cruise destinations to create a story-line, branding, and collateral materials.
- Integrating marketing strategies into capital improvement planning.

Tourism Training and Community Relations –

- Effective training methods that focus responsible tourism and make tourists aware of the local history, culture, and environment in addition to the opportunities for recreation.
- Employee participation in local community organizations and activities.
- Formation of Tourism Best Management Practices local organizations to increase involvement.
- Local port sponsorship and hosting of community events and activities.
- Boat and harbor tours that help local residents understand what a port is and does.
- Speakers’ bureaus that take the port’s story to the community and listen to community concerns.
- Sponsorship of educational programs in the media and in local organizations.
- Provision of public service information on topics such as emergency preparedness and environmental awareness.
- Publication of newsletters and press releases that keep the public informed.
- Publication of an annual report to the community highlighting community participation.

Topic Cruise Industry: Various

Document Title	***A Framework for Climate Change Adaptation in Hawai'i (FCCA)*** Prepared by Ocean Resources Management Plan (ORMP) Working Group and the University of Hawai'i, Center for Island Climate Adaptation and Policy (IACP) Prepared for Hawai'i Office of Planning Publication Date: 2009
Source	https://hdoa.hawaii.gov/wp-content/uploads/2016/09/Hawaii-Interagency-Biosecurity-Plan.pdf
APA Citation	Ocean Resources Management Plan Working Group and University of Hawai'i, Center for Island Climate Adaptation and Policy. (2009). A Framework for Climate Change Adaptation in Hawai'i (Rep.). Honolulu, Hawai'i: Hawai'i Office of Planning.

Summary	The FCCA provides a framework for planning and adaptation strategies to address climate change impacts. The framework focuses on 1. Providing context for key areas that climate change will affect, such as shoreline erosion, coastal development, coastal hazards and the preservation of natural and cultural resources and 2. Process to develop plans and decision-making on climate change adaptation.
	
	<u>Section 2: The Case for Adaptation Planning</u>
	Key information includes:
	• Types of climate vulnerability:
	  o Exposure – determined by climate forecasting based on science.
	  o Sensitivity – determined by strength of existing policy and planning.
	  o Adaptive capacity – determined by strength of existing policy and planning infrastructure.
	• The intensity of climate change impacts on Hawai'i can be controlled by taking immediate and collaborative action to prepare for forecasted climate shifts.
	• Primary vulnerabilities include availability of freshwater, exposure to coastal hazards (sea level inundation), and negative impacts of climate change to coastal/marine ecosystems.

Key Sections / Chapters	<u>Section 3:</u> • Executive Summary
Topic	Resiliency

Document Title ***Statewide Fuel Facilities Development Plan***
Prepared by Marc M. Siah & Associates, Inc.
Prepared for State of Hawai‘i Department of Transportation, Harbors Division (DOT-H)
Publication Date: March 2009

Source DOT-H

APA Citation Marc M. Siah & Associates, Inc. (2009). Statewide Fuel Facilities Development Plan. Honolulu, Hawai‘i.

Summary

This development plan focused on needed facility improvements in Hawai‘i’s commercial harbors to allow for a continued safe and secure fuel supply chain. The development plan presented the design approach for fuel piers and components of fuel facilities. It also explored fuel facility alternatives in the existing commercial harbors and recommended that flexibility in design and construction be a key consideration for future fuel facilities in the commercial harbors to accommodate Hawai‘i’s changing fuel and energy needs. Fuel transfer operations at Honolulu Harbor are carried out at Pier 30 and Pier 51. Piers 31 and 32 contain bunkering lines that provide fuel for commercial vessels. No new or updated fuel transfer capacities are identified for Honolulu Harbor since it is anticipated that the capacity and variety of fuel shipments in and out of the harbor will not significantly increase in the future. It is recommended that fuel facilities in Honolulu Harbor be maintained in the current capacities.

Key Sections / Chapters

- Section 3: Hawaii Fuel Supply Situation
- Section 4.3: Pier Configuration and Other Considerations
- Section 6.1: Fuel Facility Alternatives in Honolulu Harbor
- Section 7.1: Assigning Priorities for Fuel Facility Upgrades Among the Commercial Harbors

Topic Resiliency, Fuel

Document Title ***O'ahu Metropolitan Planning Organization (OMPO): Transportation Asset Climate Change Risk Assessment Project***
Prepared by SSFM International
Prepared for O'ahu Metropolitan Planning Organization
Publication Date: 2011

Source http://www.oahumpo.org/wp-content/uploads/2013/02/OahuMPO-CC-Report-FINAL-Nov-2011.pdf

APA Citation SSFM International. (2011). O'ahu Metropolitan Planning Organization: Transportation Asset Climate Change Risk Assessment Project (Rep.). Honolulu, Hawai'i: O'ahu Metropolitan Planning Organization.

Summary The ORMP provides a statewide vision, framework, and implementation strategies for ocean resource protection. The ORMP states three perspectives to integrate ocean resource management and provide guidance for action. The three perspectives are 1. Connecting the land and sea, 2. Preserving ocean heritage, and 3. Promoting collaboration and stewardship. The three perspectives are further defined with management priorities, goals, actions, and metrics.

Section II: Pressures On the Ocean and Critical Issues that Need to be Addressed
This section focuses on key issues that affect ocean and coastal resource management. Key information includes:

- Ballast water and biofouling of seafaring vessels are vectors for the introduction of aquatic invasive species (AIS). Non-indigenous species cause negative impacts to important marine ecosystems.
- The U.S. Coast Guard (USCG) Ballast Water Management Program addresses the introduction of AIS by ballast water.

Section III: Management Priorities for the Adaptation Phase
This section outlines the goals, benchmarks, actions, and metrics for the three perspectives. Key information includes:

- Appropriate Coastal Development:
  - Develop long-term site-specific planning and adaptation strategies to manage retreat including prohibition of shoreline armoring and assessment of potential impacts to underground infrastructure and utilities.
  - Development should be resilient to extended power outages, interruptions of fuel supply, or loss of water and sewer services.
  - Enhance natural infrastructure to building coastal resilience.

Key Sections / Chapters	• Section II: Pressures On the Ocean and Critical Issues That Need to be Addressed, Aquatic Invasive Species • Section III: Management Priorities for the Adaptation Phase, Management Priority #1, Appropriate Coastal Development
Topic	Resiliency

Document Title ***Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Volume 1: Making Connections)***
Prepared by SSFM, HNTB, SMS Research, Group 70, Weslin Consulting
Prepared for Hawai'i Department of Transportation
Publication Date: 2011

Source http://hidot.hawaii.gov/administration/files/2013/02/hstp2011-volume1-making-connections.pdf

APA Citation SSFM International, HNTB, SMS Research, Group 70, & Weslin Consulting. (2011). Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Vol. 1: Making Connections, Rep.). Honolulu, Hawai'i.

Summary

The Hawaii Statewide Transportation Plan (HSTP) is a policy document that provides goals and objectives to guide system-level plans and master plans for the Department of Transportation's (DOT) three divisions: harbors, airports, and highways. The HSTP, Volume 1 focuses on developing connections in the transportation system by incorporating a range of priorities including environmental protection, economic development, quality of life, security, and disaster preparedness.

Chapter 1: Goals & Objectives
The HSTP identifies primary goals and objectives including:

1. (Mobility and Access) Create and manage an integrated multi-modal transportation system that provides mobility and accessibility for people and goods.
2. (Safety) Enhance the safety of the air, land, and water transportation systems.
3. (Security) Ensure the secure operation and use of the air, land, and water transportation systems.
4. (Environment and Quality of Life) Protect Hawaii's unique environment and quality of life.
5. (Economy) Ensure air, land, and water transportation facility systems support Hawaii's existing and future economy.
6. (Energy) Support the State's energy goal of 70% clean energy by 2030.
7. (Economy) Create secure, flexible, and sustainable revenues and funding sources for transportation needs.
8. (Planning Process) Implement a statewide planning process that correlates land use and transportation while supporting decision-making and programming for Hawaii's integrated, comprehensive, and multi-modal transportation systems.

Chapter 2: Transportation Influencers
This chapter identifies four variables that influence transportation planning

including demographic forecasts, land use, eight planning factors, and emerging issues. Demographic forecasts by the State Department of Business Economic Development and Tourism (DBEDT) are projected to the year 2035. Land use considers state and county level land use laws. Eight planning factors were developed by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). Emerging issues including energy independence, sustainability, and protection of natural resources.

Chapter 3: Existing Systems
This chapter provides information the existing conditions and systems including descriptions of existing transportation facility systems and state/federal transportation planning laws and regulations. In total, HDOT is responsible for planning, designing, constructing, operating, and maintaining 15 airports, 10 commercial harbors, and approximately 2,450 miles of paved roadways.

Chapter 4: Updated Framework for Planning
This chapter provides an overview of the planning process/framework and current organizational structure. It also identifies changes/new alignments in the organizational structure that will support multi-modal transportation.

Chapter 5: Data Systems
This chapter provides an overview of the data systems needed to support transportation planning including data on trends and indicator measures, GIS database of natural resource features, land use GIS layers, and performance measures.

Chapter 6: Financial Systems
The chapter provides an overview of the three divisions' revenue sources from user fees/charges and Federal funds.

Chapter 7: Public Participation
This chapter provides an overview of the public involvement during the preparation of the HSTP.

Topic Statewide Transportation Plan

Document Title ***Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Volume 2: Emerging Issue Papers)***
Prepared by SSFM, HNTB, SMS Research, Group 70, Weslin Consulting
Prepared for Hawai'i Department of Transportation
Publication Date: 2011

Source http://hidot.hawaii.gov/administration/files/2013/02/hstp2011-volume2-issue-papers.pdf

APA Citation SSFM International, HNTB, SMS Research, Group 70, & Weslin Consulting. (2011). Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Vol. 2: Emerging Issue Papers, Rep.). Honolulu, Hawai'i.

Summary The Hawaii Statewide Transportation Plan (HSTP) is a policy document that provides goals and objectives to guide system-level plans and master plans for the Department of Transportation's (DOT) three divisions: harbors, airports, and highways. The HSTP, Volume 2 analyzes ten emerging issues that will have major impacts on Hawaii's transportation future including:

1. Impact of Federal Planning Requirements (Eight Planning Factors)
   Federal Transportation Law requires states to consider eight planning factors when developing long-range transportation plans. The eight planning factors include economy, safety, security, accessibility and mobility, environment, integration and connectivity, efficient system management and operations, and preserve existing transportation system. The factors are not prescriptive and allow States to interpret the factors in the context of their State. The requirements are intended to help States develop thoughtful and robust recommendations that address current and emerging transportation issues. In addition federal requirements for state transportation planning require states prepare a long-range Statewide Transportation Plan (STP), Statewide Transportation Improvement Program (STIP), and involve the public in the development of both plans. Other key recommendations include:
   - Continue to apply/review the eight planning factors to all modes: airports, harbors and surface transportation, including non-motorized modes of transportation such as pedestrians and bikes.
   - Maintain dialogue/discussion on the eight planning factors with the public and stakeholders in improve/enhance the transportation planning process.

2. Climate Change and Sea Level Rise
   This chapter provides an overview of the causes and impacts of

climate change and sea level rise. In general, the negative impacts of climate change on the transportation system include:

- Damage to infrastructure due to extreme heat.
- Increased incidence of wildfire and drought.
- Increased intense runoff causing surface damage.
- Rising sea level causing coastal erosion and wave impacts.
- Drainage problems in coastal settings due to flash flooding and drainage blocked by high sea levels.
- Changes in tropical storms and the damage they cause.

Key concerns relevant to the harbor include:

- Sea level rise could impact loading/unloading cargo/passengers if piers are underwater or roads leading to/from harbors are inundated.
- Sea level rise could impact the groundwater system, increasing drainage problems.

Recommended policy practices relating to sea level rise include:

- Plan for one meter rise in sea level by the end of the century. This is a conservative benchmark.
- Retrofit facilities as part of ongoing maintenance and upgrade to handle sea level rise.

3. Aging Population and Transportation

This chapter provides recommendations for transportation planning, policy and infrastructure in order to meet the needs of the elderly population. Key recommendations include:

- Recognize that providing safety and mobility to the elderly to and on the state transportation systems for all three modes.
- Plan for assessments of challenges the aging population faces in traveling through the islands' airports, harbors, and other intermodal terminals.
- Plan for an increase in the State's elderly population, which is expected to approach 25% of Hawaii's total population by 2030.

4. Fuel and Energy Scenarios in Hawaii

This chapter provides recommendations for reducing use of fossil fuels and increasing use of alternative energy sources and energy conservation. The Hawaii Clean Energy Initiative (HCEI) sets the goal of meeting 70% of Hawaii's energy needs with clean energy by the year 2030. Recommendations to reduce energy consumption relevant to the Honolulu Harbor include:

- Consider facilities at contiguous properties allow secure transfer of cargo between the two modes.

- Integrate Highways and Harbors Divisions planning, design, and construction to facilitate the mobility of people and goods.
- Develop berthing and backup infrastructure that would be conducive to large-batch cargo movement.
- Promote off-dock consolidators to support Hawaii's small businesses who may be unable to afford full container loads.

Recommendations on actions needed to clarify benchmarks, modal responsibilities, and the likely effects of changes in fuels and usage that are relevant to the Honolulu Harbor:

- Translate the State's mandate to attain 70% clean energy by 2030.
- Develop HDOT energy action plan to define energy action in relation to sustainability and climate change.
- Develop performance measures for improving energy efficiency in order to monitor change and evaluate progress.

5. Land Use Planning

   This chapter provides goals and objectives that link land use and transportation infrastructure. It also provides a background on the development of land use planning in Hawai'i. Key recommendations include:

   - Maintain a planning emphasis on the transportation/land use connection through collaborative planning efforts.
   - Advance transportation projects and facility planning that are consistent with County General Plan and Community Plans.
   - Continue to develop a data system to include environmentally sensitive areas and the adaptation to sea level rise and climate change.
   - Integrate US Green Building Council (USGBC) standards for Leadership in Energy and Environmental Design (LEED) related to transportation facilities.

6. Planning & Design: Context Sensitive Solutions (CSS), Complete Streets, Smart Growth, and Transit Oriented Development (TOD)

   This chapter provides sustainable practices to reduce transportation's overall carbon footprint by planning and designing context sensitive multi-modal transportation systems. The recommendations in this chapter are primarily targeted towards DOT Highways Division.

7. Transportation Security

   This chapter provides an overview on transportation security planning to minimize danger from human purposefully-caused incidents and damage by natural disasters. Recommendations suggest the HSTP Update should include the following standalone

security goal and objectives:

- Goal III: Ensure the secure operation and use of the air, land, and water transportation systems.
- Objective 1: Minimize risks of disruption of transportation to, from and within Hawaii due to threats or events caused by humans/terrorism and natural causes.
- Objective 2: Work with Federal, State, and County agencies and tenants to conduct vulnerability and risk assessments.
- Objective 3: Implement security policies and strategies to minimize risks and threats of disruption or damage to the transportation systems.
- Objective 4: Provide continuous monitoring of critical infrastructure communication systems to provide appropriate emergency response capability.
- Objective 5: Develop a biosecurity plan and measures against pests and disease.

Recommendations for transportation planning relevant to harbors includes:

- Provide for on-going preparedness for known and evolving threats.
- Assure that sufficient capacity is available and that staff are trained to provide security on a 24/7 basis.
- Assure that the most appropriate technologies are identified, acquired, and operated to minimize security threats.
- Continually adapt to and incorporate new federal requirements and evolving understandings of natural environment and human-caused risks.
- In collaboration with Airports, develop a biosecurity plan and measures to protect against pests and disease.

8. Systems Prevention and Asset Management

This chapter provides an overview on balancing current/future needs and deferred maintenance to ensure DOT infrastructure functions for a long useful life at the lowest reasonable cost. Recommendations from a 2007 Consulting Engineer's Report on harbors include:

- The imperative to cover the ratio of new revenues to harbor revenue bond debt service requirements coupled with political pressures to not raise tariffs effectively forces DOT-HAR to defer high cost, long term capital maintenance, and improvements year after year.
- The bond coverage requirements and biennial planning/budgeting constraints only serve to reinforce the cycle of deferring maintenance and improvements until they reach a crisis rather than systematically performing preventative maintenance and planned improvements. A

quantum change in the structure (i.e. revenues) and program management for capital improvements will be needed if the HHUG vision is to be realized and in order for Harbors to proactively meet the maritime needs of the State.

Key recommendations include:

- Adopt a "maintenance first" policy.
- Adopt policy to establish maintenance requirements and expected lifecycles for significant assets.
- Refine asset management process to include performance measures or best practices. This would include periodic public reporting.
- Provide periodic reporting of anticipated costs for system preservation with costs of deferred maintenance/rehabilitation.
- Use GIS for asset management to provide a record of location/condition of assets.
- Seek alternative funding sources (i.e. TIGER grant).

9. Financial Scenarios

This chapter provides an overview of revenues, fund sources, expenditures, fund opportunities, and challenges. For harbors, the most immediate financial challenge is to increase tariffs to correct a growing structural imbalance between operating revenues and expenditures. Opportunities identified for harbors include:

- Implement new tariff structure that tracks with inflation.
- Identify other revenue sources including facilities rentals policies.

Recommendations suggest the HSTP Update should include the following goal and objectives:

- Objective 1: Develop a statewide framework for long-range financing forecasting, within the five-year plan update cycle to ensure system sustainability.
- Objective 2: Identify, develop, and secure funding for the needed delivery, maintenance, operation, and rehabilitation, replacement, and expansion of the State's transportation facilities. Consider innovative and non-traditional transportation financing.
- Objective 3: Ensure funding for the safety and security of the State's transportation facilities and services.
- Objective 4: Maximize the use of Federal programs and funding for needed transportation infrastructure and report on project and program achievements on an annual basis.
- Objective 5: Achieve project readiness in support of new funding sources as they come available and report on achievements of project completion on an annual basis.

10. Environmental Coordination

This chapter provides an overview of linking transportation and environmental planning and processes. Recommendations to strengthen the relationship between planning and environmental review includes:

- Create and implement Integrated Sub-Area Regional Planning (ISAP) that links strategic planning to project implementation through a visioning process.
- Identify important statewide sub-areas for the ISAP Program. For sub-areas, identify data, resources, and inventory modes and funding sources.
- Identify categories for environmental mitigation.
- Identify guidelines to alleviate environmental degradation.
- Set system-wide Performance Goals for the environment.
- Use Programmatic Environmental Impact Statements.

Four strategic action items to create a new approach to linking transportation and environmental planning:

- Indirect and Cumulative Impact Analysis
  - Establish GIS overlays of past, current and predicted future conditions of the natural and built environments.
  - Describe airsheds, watersheds, conservation areas and other environmentally sensitive areas.
  - Centralize information on population, employment, and demographic trends and forecasts.
  - Identify local land use, growth management, and development plans.
- Environmental Mitigation Opportunities
  - Describe “types” of mitigation activities that can be used for mitigating impacts (i.e. wetland replacement, avoidance of habitat fragmentation, preservation of habitat for endangered species etc).
  - Discuss specific geographic areas (i.e. conservation areas or refuges), where protection and restoration is advised by environmental agencies.
  - Consider an ecosystem or watershed approach to mitigation.
- Goals for the Environment and the Transportation System
  - The goal for a multi-modal system that supports the State’s economic, environment, and quality of life goals should serve as a platform for project specific goals, purpose, and need.
  - System planning level objectives can be incorporated into modal level long range plans and project level

documents.
    - Create Performance Measures for transportation and the environment.
- Coordinate Transportation, the Environment, and Land Use through Integrated Sub-Regional Area Planning
    - Undertake ISAP in areas of statewide interest/concern, environmentally sensitive areas, or high growth areas.
    - Identify critical geographic areas that would benefit from ISAP.
    - Responsibility for initiating and conducting ISAP should rest with STP Office.

Topic	Statewide Transportation Plan

Document Title ***Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Volume 3: Forecast Reports and Public Involvement Summary)***
Prepared by SSFM, HNTB, SMS Research, Group 70, Weslin Consulting
Prepared for Hawai'i Department of Transportation
Publication Date: 2011

Source http://files.hawaii.gov/dotadmin/stp/hstp-1/hstp2011-volume3-reports-public-involvement-summaries.pdf

APA Citation SSFM International, HNTB, SMS Research, Group 70, & Weslin Consulting. (2011). Hawaii Statewide Transportation Plan: Hawaii's Multi-Modal and Inter-Modal Network (Vol. 3: Forecast Reports & Public Involvement Summaries, Rep.). Honolulu, Hawai'i.

Summary

The Hawaii Statewide Transportation Plan (HSTP) is a policy document that provides goals and objectives to guide system-level plans and master plans for the Department of Transportation's (DOT) three divisions: harbors, airports, and highways. The HSTP, Volume 3 analyzes available 2035 forecast trends that will have major impacts on Hawaii's transportation future including: demographic, economic, types of data in July 2009 State projections, and US Census and American Community Survey (ACS).

Section B: Demographic Trends (December 2008 Series Data)
Key information includes:

- Growing population:
  - The State is forecast to grow 27% between 2010 and 2035. Honolulu is forecast to grow 20% and neighboring islands to grow 43% during that same period.
  - In 2010, DBEDT estimates that Honolulu is 70% of the State's population, while in 2035 that percentage will decrease to 66%.
- Aging population:
  - An older population will directly affect the demands placed on the transportation system.
  - More of the population will be of working age, which will place greater demands on the highway and public transportation system.
  - As elderly population increases, there will be an increased demand for specialized transportation services and greater demand for off-peak travel.

Section C: Economic Trends (December 2008 Series Data)
Key information includes:

- The number and types of jobs will significantly affect transportation planning.

- 2008 DBEDT forecast shows that jobs will increase statewide and will grow at a slower rate on Oahu than in other counties.

Section D: Types of Data in July 2009 State Projections
Key information includes:

- DBEDT 2035 projections include information on State gross domestic product income, personal income at the state and county level, and visitor projections.

Section E: US Census and American Community Survey (ACS)
Key information includes:

- The Census Transportation Planning Package (CTPP) is a long survey form that gathers information on residence, place of work, and the journey to work regarding mode, length of trip, and more.
- CTPP long form survey was replaced by the ACS. The ACS also provides useful data on population, household characteristics, families, and housing units. However, precision levels are lower or not available unlike the long form.

Appendices

- Appendix 1: 2035 Population and Socio Economic Forecasts Report
- Appendix 2: Existing Transportation Plans by Year of Adoption
- Appendix 3: 2009 HDOT Public Involvement Policy
- Appendix 4: HSTP Statewide Telephone Survey Report
- Appendix 5: Report on Transportation-Related Issues for Under-Represented Populations and Businesses in Hawaii
- Appendix 6: Countywide Public Information Meeting Summaries
- Appendix 7: Stakeholder Workshop Summaries
- Appendix 8: The Commodity Flow Process for a Product
- Appendix 9: Data, Trends, and Indicators Report

Topic Statewide Transportation Plan

Document Title ***Hawai'i Ocean Resources Management Plan (ORMP)***
Prepared by Hawai'i Office of Planning
Prepared for Hawai'i Office of Planning
Publication Date: 2013

Source http://files.hawaii.gov/dbedt/op/czm/ormp/ormp_update_reports/final_ormp_2013.pdf

APA Citation Hawai'i Office of Planning. (2013). Hawai'i Ocean Resources Management Plan (Rep.). Honolulu, Hawai'i: Hawai'i Office of Planning.

Summary The ORMP provides a statewide vision, framework, and implementation strategies for ocean resource protection. The ORMP states three perspectives to integrate ocean resource management and provide guidance for action. The three perspectives are 1. Connecting the land and sea, 2. Preserving ocean heritage, and 3. Promoting collaboration and stewardship. The three perspectives are further defined with management priorities, goals, actions, and metrics.

Section II: Pressures On the Ocean and Critical Issues that Need to be Addressed
This section focuses on key issues that affect ocean and coastal resource management. Key information includes:

- Ballast water and biofouling of seafaring vessels are vectors for the introduction of aquatic invasive species (AIS). Non-indigenous species cause negative impacts to important marine ecosystems.
- The U.S. Coast Guard (USCG) Ballast Water Management Program addresses the introduction of AIS by ballast water.

Section III: Management Priorities for the Adaptation Phase
This section outlines the goals, benchmarks, actions, and metrics for the three perspectives. Key information includes:

- Appropriate Coastal Development:
  - Develop long-term site-specific planning and adaptation strategies to manage retreat including prohibition of shoreline armoring and assessment of potential impacts to underground infrastructure and utilities.
  - Development should be resilient to extended power outages, interruptions of fuel supply, or loss of water and sewer services.
  - Enhance natural infrastructure to building coastal resilience.

Key Sections / Chapters	• Section II: Pressures On the Ocean and Critical Issues That Need to be Addressed, Aquatic Invasive Species • Section III: Management Priorities for the Adaptation Phase, Management Priority #1, Appropriate Coastal Development
Topic	Statewide Plan

Document Title ***Vessel Biofouling in Hawai'i: Current Patterns of a Potent Marine Bioinvasion Vector and Potential Management Solutions (VBH)***
Prepared by Ian Davidson, Greg Ruiz, and Sonia Gorgula
Prepared for Hawaii Department of Land and Natural Resources (DLNR)
Publication Date: 2014

Source http://www.cgaps.org/wp-content/uploads/Hawaii-Biofouling-Report-2014-FINAL.pdf

APA Citation Davidson I, Ruiz G, and Gorgula S. (2014). Vessel Biofouling in Hawai'i: Current Patterns of a Potent Marine Bioinvasion Vector and Potential Management Solutions (Rep.). Honolulu, Hawai'i: Hawai'i Department of Land and Natural Resources.

Summary The report identifies biofouling (the animals and seaweeds that attach to submerged portions of vessels) as a major source of marine invasion in Hawai'i. Non-native species are transferred to the state in ballast tanks of ships, in water systems of boats (bilge tanks), in the dry ballast of historical vessels, and attached to submerged surfaces of vessels as biofouling. No other vector ranks higher than vessel biofouling for introducing non-native species to Hawai'i. Biofouling has introduced approximately 78% of introduced or cryptogenic marine species to Hawai'i.

Section: Biofouling Maintenance and Hull Husbandry by Hawai'i's Commercial Fleet
Key information includes:

- Commercial shippers' tools to prevent biofouling include:
  - Anti-fouling (A/F) or foul-release (F/R) paints applied to the hull and niche surfaces of ships. Paints either release biocide or create a smooth surface that reduced adhesion of biofouling organisms.
  - In-water cleaning to maintain submerged surfaces and install equipment to prevent biofouling accumulation.
- Surveyed vessels to determine vessel husbandry techniques:
  - 76% used A/F paint on all submerged surfaces; 15% used F/R paint and 5% used a combination of A/F and F/R paint on different hull locations.
  - 28% of vessels conduct in-water cleaning.
  - 65% of respondents were familiar with the International Maritime Organization (IMO) biofouling guidelines and log book.
- Risky behaviors identified include long duration between maintenance, long lay-up times in foreign ports, and generally poor responses regarding in-water cleaning.
- Provide regulatory incentive for all ships to conduct biofouling

management to reduce risks for future introduction of non-native species.

Section: Research & Monitoring Recommendations for Marine Invasions and Biofouling Vectors in Hawai‘i

Key recommendations include:

- Implement a monitoring program using standardized protocols at Honolulu Harbor to improve baseline knowledge and detection of Hawai‘i marine invasions.
- Conduct biofouling surveys of arriving vessels in Hawai‘i.

Section: Evaluation of Biofouling Management Strategies for Vessel Arrivals from Out-of-State

Strategies to address biofouling:

- “Take-no-action” approach or retain the status quo entails no reduction in marine invasions from shipping vessels and the impacts of marine invasion will increase over time.
- “Wait-and-see” approach entails learning more about risk reduction before taking action. During this period, Hawai‘i could require vessels to submit annual reporting forms on their biofouling management and request management plans/log books made available for examination upon request.
- Voluntary biofouling standards: develop biofouling policy/standards that are not mandatory (e.g., New Zealand creating biofouling regulation/standards, but has a 4-year voluntary lead-in period).
- Mandatory biofouling rules: develop mandatory biofouling compliance standards and enforce the standards.
- Expand the Papahanaumokuakea Marine National Monument (PMNM) biofouling policy to the rest of Hawai‘i.

Key Sections / Chapters

- Section: Biofouling Maintenance and Hull Husbandry by Hawai‘i’s Commercial Fleet

Topic

Biosecurity

Document Title ***Vulnerability of Hawai'i Commercial Port and Harbor Facilities to Tsunamis and Hurricane Storm Surge and Wave Action***
Prepared by Ian N. Robertson
Prepared for Hawai'i Department of Transportation, Harbors Division
Publication Date: 2015

Source N/A

APA Citation Robertson, Ian N. (2015). Vulnerability of Hawai'i Commercial Port and Harbor Facilities to Tsunamis and Hurricane Storm Surge and Wave Action (Rep.). Honolulu, Hawai'i: Hawai'i Department of Transportation, Harbors Division.

Summary The report provides an assessment of the vulnerabilities of various aspects of port operations and facilities during hurricane and tsunami events. Recommendations based on the assessment are provided.

Section 4.4: Honolulu Harbor, Oahu
Based on the US Army Corps hurricane simulations, the worst storm surge and characteristic wave height at Honolulu Harbor includes:

- Storm surges are predicted to reach 7-8 ft, resulting in partial inundation of Sand Island.
- Characteristic wave height in the harbor could reach 10 ft, particularly in the harbor entrance channel adjacent to Piers 1 and 2.
- Immediately outside of the harbor the wave height rapidly increases to over 35 ft.

Section 4.4.1: Procedures during hurricane and tsunami warnings
Key information includes:

- When a warning is issued, the Coast Guard on Sand Island determines whether to call a mandatory evacuation.
- During a warning, port authorities are stationed at the Harbor Emergency Operations Center (EOC) on Pier 2 and the Harbor Control Office in Aloha Tower. Radio communications will be used between these centers, Honolulu City and County EOC and Hawaii Emergency Management Agency (HI-EMA).
- Once the warning has passed, the Coast Guard will determine when it is safe to return to port.
- It's likely that many fishing vessels, floating dry docks and other moored barge vessels will break their moorings because of strong currents, resulting in potential grounding or impact with adjacent piers, buildings and other structures.
- Evacuations require linesmen, tug operators and pilots.

Section 4.4.4: Honolulu Harbor Piers

Key information includes:

- Based on the Great Aleutian Tsunami simulation, Honolulu Harbors 50 piers are expected to be inundated by flow depths from 3 to 10 ft.
- Many of the piers are pile supported, making them vulnerable to uplift due to hurricane storm surge and wave action, or tsunami inflow conditions.
- Pier 1 was constructed with "pressure relieving precast panel" system, which has panels that will lift when the pressure below the pier exceeds 175 psf.
- Piers 51-53 are designed to support significant gravity loads, including the cranes used to load and offload shipping containers, so they are not expected to suffer any damage during a hurricane or tsunami.
- A majority of the piers have been constructed relatively recently and are not likely to suffer damage during an extreme event.
- Older piers may suffer damage during extreme events, but if the functions served by these piers are not critical, there is no need to strengthen them for hurricane or tsunami loads.

Section 4.4.5: Shipping Container Storage Areas

Key information includes:

- Primarily shipping container handling/storage locations: Pier 1 (Pasha Hawaii and International Cargo), Pier 51 (Horizon Lines), Pier 52 and 53 (Matson Shipping), Pier 39 through 41 (Young Brothers), and Pier 29.
- Shipping containers are generally stacked 3-4 ft high without restraint or interconnection between containers.
- With anticipated flow depths of 3-10 ft, all enclosed shipping containers would likely float and be displaced with flows. A possible solution is to use open-sided containers at the bottom of container stacks to avoid buoyancy effects.
- Limited access to the main container areas on Sand Island, and long haul distances to suitable storage areas outside of the inundation zone make mass evacuation of shipping containers challenging.
- Potential shipping container evacuation sites include Puuhale Elementary School, Kalakaua District Park, and Farrington High School, which all have open field areas for container storage.
- Kapalama Military Reservation is being developed to serve as a new container storage facility.
- Gantry cranes will likely experience impact strikes from floating shipping containers during inundation events. It is unlikely that debris strikes will cause any structural damage. Water and debris impact will likely damage electrical and other sensitive equipment located at the base of the crane, making them inoperable after the event.

- Mobile fork-lifts will need to be relocated outside of inundation zone.
- After a major inundation event, it's likely that a number of shipping containers will sink to the bottom of the harbor. Acquiring a side sonar boat to scan for debris might reduce draft in the harbor channel and basin.
- Three alternatives for accepting incoming cargo after a disaster:
    1. A Memorandum of Understanding (MOU) between the State and the US Navy was created to facilitate an Alternative Port Concept that allows use of a pier in Joint Base Pearl Harbor Hickam (JBPHH) for emergency cargo handling.
    2. Pier 1 and 2 could be used with Pasha Hawaii roll-on roll-off facilities or HIS mobile crane.
    3. Kalaeloa Barbers Point Harbor.

Section 4.4.6: Fuel Storage Facilities

Key information includes:

- Locations include tank farm adjacent to Pier 30 and aviation fuel storage tank farm adjacent to Sand Island Access Road.
- Facilities should be protected from inundation damage or located outside of inundation zone.

Section 4.4.7: Bulk Handling Facilities

Key information includes:

- Bulk handling facilities primarily located at Kalaeloa Barbers Point Harbor.
- Bulk facility for wheat is located adjacent to Pier 23.
- Unlikely reinforced concrete silos will be damaged by inundation, but associated electrical/mechanical equipment will likely be inoperable.

Section 4.4.9: Adjacent Critical Facilities

Key information includes:

- The main wastewater treatment plant for Honolulu is located on Sand Island. During inundation, electrical/mechanical equipment will be inoperable. There is potential for large sewage spills. Extended downtime will result in discharge of untreated sewage directly into the ocean.

Section 5.2: Conclusions

Key information includes:

- All harbors have procedures in place to respond to hurricane or tsunami warnings. Procedures sometimes vary between harbors. Implementation of procedures has not always gone smoothly during recent warning events.

- Every effort should be made to evacuate all ships and barges to deep water prior to a warning level event.
- Stevedores, pilots, and tugboats are required for ship evacuation. If a warning occurs during non-working hours, these requirements can result in significant delays to the evacuation process.
- Field instrumentation to monitor/understand potential currents in critical ports should be developed/installed to monitor current and wave conditions during future tsunami and hurricane events.
- Verify shipping containers and other floating debris have not sunken in the harbor channel/basin thus reducing available draft.
- Coordinate alternative container handling procedures such as roll-on roll-off ramps, ship-mounted cranes and mobile land-based cranes until the harbor cranes are repaired.

Section 5.3.1: Recommendations for Harbor Procedures

Key information includes:

- Standardized procedures to following during hurricane and tsunami warnings.
- Identify the chain of command and decision-making protocol during warning events. Rehearse procedures on an annual basis.
- Designate safe location for District Managers to evacuate to. These locations should have radio or other forms of communication with County EOC, HI-EMA and HDOT Harbor Division EOC.
- Identify conditions which the all-clear can be issued for land-based operations to resume. Identify procedure for reentry to harbor.
- Ability to access sonar equipment to scan for sunken objects that might reduce draft in the harbor channel/basin.
- Continue Hawaii Marine Transportation Systems Recovery Unit (MTSRU) and Honolulu Harbor Users Group (HHUG) to develop relationship and trust to allow quick/flexible decision making during clean-up and recovery process.

Section 5.3.2: Ship and Barge Evacuation

Key information includes:

- Evacuation of large ships and barges to deep water should be a priority once warning is announced.
- Essential port personnel should have special ID passes that permit entry during a warning.
- Activities that don't require land-based personnel should be permitted under warning conditions to accelerate evacuation process. Union rules should be waived under these conditions.
- Suitable deep water anchor zones should be identified.
- Anticipate smaller vessels, floating drydocks and other floating objects will likely break free from moorings and damage piers,

buildings and other facilities.
- Develop field instrumentation to monitor current/wave conditions during future tsunami and hurricane events. The data collected could be used to calibrate numerical models to simulate hydrodynamic effects in the port.

Section 5.3.3: Harbor Piers and Wharfs
Key information includes:
- Future piers should incorporation "pressure relief panels" to reduce uplift pressures.
- New wharf construction should incorporate soil stabilization measures to limit the potential for liquefaction.

Section 5.3.4: Shipping Container Storage Yards
Key information includes:
- Provide evacuation for all containers with hazardous and perishable materials outside of inundation zone.
- Establish MOUs with owners of evacuation sites.
- Provide special ID for harbor personnel required for shipping container evacuation.
- Consider opening doors of and restraining empty containers left to avoid buoyancy forces.
- Remove all mobile container handling equipment prior to inundation so that it's available to assist with post-event recovery.

Section 5.3.5: Fuel Storage Facilities
Key information includes:
- Design enclosure walls and earthen berms that withstand external hydrostatic and hydrodynamic pressure and will not be overtopped.
- Identify alternative fuel storage facilities outside of inundation zone.

Section 5.3.6: Bulk Handling Facilities
Key information includes:
- Locate electrical/mechanical components of bulk handling equipment above anticipated inundation level or waterproofed.

Section 5.3.7: Harbor Buildings
Key information includes:
- Essential/critical buildings should be evaluated structurally to ensure they can withstand anticipated hydrodynamic and debris impact loading.
- Important warehouse and harbor buildings should be evaluated structurally.

Section 5.3.8: Adjacent Critical Facilities

Key information includes:

- Power plants should be evaluated for their exposure to impact damage from floating debris.
- Sand Island Wastewater Treatment Plant should be evaluated for its ability to survive a design level hurricane/tsunami without resulting in sewage spills.

Key Sections / Chapters

- Chapter 4.4: Honolulu Harbor, Oahu
- Chapter 5: Summary, Conclusions and Recommendations

Topic

Resiliency

Document Title ***Hawaii Interagency Biosecurity Plan 2017-2027(HIBP)***
Prepared by Hawaii Department of Agriculture (HDOA)
Prepared for Hawaii Department of Agriculture
Publication Date: 2016

Source https://hdoa.hawaii.gov/wp-content/uploads/2016/09/Hawaii-Interagency-Biosecurity-Plan.pdf

APA Citation Hawaii Department of Agriculture and Department of Land and Natural Resources. (2016). Hawai‘i Interagency Biosecurity Plan 2017-2027 (Rep.). Honolulu, Hawai‘i: Hawai‘i Department of Agriculture.

Summary

The report provides a comprehensive interagency plan for risk management of invasive species to the economy, environment, and health/lifestyle of the people of Hawai‘i by identifying and addressing gaps in biosecurity. The HIBP provides guidance for implementing the infrastructure and capacity needed to support biosecurity programs by multiple agencies and partners, including Hawai‘i Department of Agriculture (HDOA), Department of Land and Natural Resources (DLNR), Department of Health (DOH), University of Hawai‘i (UH), private industry and the public. The HIBP addresses the pre-border, border, and post-border zones, which are concentric radii used to delineate distances to/from Hawai‘i. Key steps to implement the HIBP:

- Off-shore compliance: Agreements with other jurisdictions to adopt pre-shipping inspection and control policies.
- E-manifest and intelligence gathering: New technology to track what is coming in, what is high risk, and what is low risk (for faster release).
- Inspection facilities: Well-lit, secure containment areas for inspection, quarantine, treatment, and pest destruction capabilities, and refrigerated areas for produce.
- Inspection of nonagricultural items: Provide HDOA the authority and staff to inspect high-risk nonagricultural items.
- Emergency response capacity: Interagency plans, protocols, and funding in place for timely and effective response to new pest incursions.
- Better coordination and participation by industries: Expansion of the Hawaii Invasive Species Council to include industry and improve interagency coordination.
- Minimized interisland spread: Increase staff and inspections for interisland goods.

Section 2.2: HDOA Biosecurity Program
HDOA’s biosecurity program was created by Act 236 of the Session Laws

of Hawai‘i 2008. The program’s objectives are to 1. Establish a multidimensional system to prevent the entry into the state and interisland movements of pests and prohibited/restricted organisms without permits, and 2. Respond effectively to eradicate, control, reduce, and suppress incipient pest populations and established pests and seize/dispose of prohibited/restricted organisms without a permit. Key actions identified include: establish pre-entry inspection programs, operate inspection facilities at ports of entry, collaborate between governmental agencies/industry, and develop new tools to collect info on cargo being shipped.

Section 3.1.1: Pre-border – Background

Key information includes:

- For regulating aquatic organisms, U.S. Coast Guard (USCG), U.S. Environmental Protection Agency (EPA), Division of Aquatic resources (DAR) and DOH share regulatory authority to prevent entry of aquatic invasive species (AIS) via ballast water. Agencies have the authority to regulate ballast water discharged in state waters irrespective of whether the vessel is foreign or domestic (U.S. mainland) port, except Department of Defense (DOD) vessels.
- Insufficient coordination between national and international port authorities, DOD, and shipping companies to ensure the ballast water procedures are implemented consistently.
- Current regulation regarding exchange of ballast water and reporting/documenting systems doesn’t provide adequate protection and needs to be updated to at least meet more protective USCG national standards.
- USCG doesn’t regulate and the state doesn’t have the authority to regulate full biofouling.

Section 3.1.2: Policy, Process, Technology, Infrastructure, Funding, Staffing Objectives and Implementation Tasks for Pre-border

Key implementation tasks include:

- Propose legislative amendments to HRS § 150A-5 (and other sections) to enable HDOA to screen and inspect nonagricultural commodities and amend or promulgate corresponding administrative rules, as needed. Partners: Hawai‘i Department of the Attorney General (AG) and Hawai‘i Department of Transportation (HDOT); Priority ranking: 1.
- Require declaration of high-risk packaging materials in shipments to Hawai‘i regardless of commodity. Partners: HDOT; Priority ranking: 3.
- Amend HAR § 13-76 to make it consistent with USCG ballast water regulations. Partners: DOH, HDOT, USCG; Priority ranking: 1.
- Enter cooperative agreements with other state DOA or private

industries to establish offshore screening programs for high-risk commodities being shipped to Hawai‘i. Partners: AG, HDOT; Priority ranking: 1.
- Implement a comprehensive e-manifest system. Partners: HDOT; Priority ranking: 1.
- Conduct risk assessment for hull fouling, ballast water, aquaculture, and aquarium issues. Partners: DOH, HDOT, USCG, HDOA, Animal and Plant Health Inspection Service (APHIS), U.S. Fish and Wildlife Service (USFWS), Industry, Pacific; Priority ranking: 1.
- Fund equipment and licensing to support the e-manifest system. Partner: HDOT; Priority ranking: 1.

Section 3.2: Border

Key recommendations include:

- Plan and secure additional and appropriate air-conditioned cargo inspection facilities in the vicinity of the Honolulu Harbor to reduce the chances for pests to escape and maintains food quality during inspections. Coordinate with HDOT and private sector to use available space at port/harbor to meet growing need to inspection.
- Ballast water and hull biofouling are the two primary sources for AIS into the state. HIBP recommends developing standard operating procedures for collecting and reporting data, implementing best management practices for hull cleaning, testing and applying new techniques for treating ballast water and hull biofouling to minimize the spread of AIS. In addition, increase staffing and implement a data management system.

Section 3.2.2: Policy, Process, Technology, Infrastructure, Funding, Staffing Objectives and Implementation Tasks for Border

Key implementation tasks include:

- Propose legislation to authorize DLNR to inspect vessels and regulate hull-fouling threats. Partners: HDOT, DOH, USCG; Priority ranking: 1.
- Run monitoring programs at major ports and harbors for high-risk pests. Partners: DLNR, HDOT, DOH, U.S. Department of Agriculture (USDA), USFWS; Priority ranking: 2.
- Create standard operating procedures for vessel biofouling inspections and a form to report hull inspection and protocols to quarantine noncompliant vessels. Partners: DOH, HDOT, EPA, USCG; Priority ranking: 2.
- Create database to house data collected for ballast water reporting and management and hull inspection and hull biofouling treatment. Partners: HDOA, HDOT, USCG, EPA; Priority ranking: 1.
- Implement new methods/technologies for ballast water and hull biofouling monitoring, treatment, and compliance monitoring and

assessment. Partners: HDOA, HDOT, DOH, USCG, EPA; Priority ranking: 2.

- Develop best ballast water and hull husbandry practices. Partners: DOH, HDOT, EPA, USCG; Priority ranking: 2.
- Create multiagency Biosecurity Emergency Response Task Force. Partners: DOH, Hawai‘i Invasive Species Council (HISC), HDOT, Hawai‘i Emergency Management Agency (HI-EMA), APHIS, U.S. Customs and Border Protection (CBP), USCG, U.S. Fish and Wildlife Service (USFWS), National Park Service(NPS), DOD, USCG; Priority ranking: 2.
- Coordinate/review/debrief rapid response actions. Partners: DLNR, HISC, DOH, HDOT, HI-EMA, APHIS, CBP, USCG, USFWS, NPS, DOD, Industry; Priority ranking: 3.
- Develop contingency plans for treating/disposing of dirty ballast water and for cleaning biofouling vessels. Partners: DOH, HDOT, USCG, EPA, National Oceanic and Atmospheric Administration (NOAA).
- Install effective containment features, attractants, and traps in the vicinity of ports of entry to monitor for pests. Partners: HDOT, priority ranking: 2.
- Fund equipment, licensing, and staffing to support DLNR’s ballast water and hull fouling reporting, tracking, and compliance monitoring data management system. Partners: DOH, HDOT, EPA, USCG; Priority ranking: 1.

Section 3.3: Post-border

Key recommendations include:

- Strategies to contain pests involve working with producers and industries that ship high-risk commodities interisland and inspecting their cargo.
- A major gap identified was invasive species introduced to one island would spread to other islands by interisland movement of commercial and recreational vessels that are encrusted with hull-fouling organisms, facilitating the spread of AIS. Vessel biofouling is the most common pathway for spreading AIS.

Section 3.3.2: Policy, Process, Technology, Infrastructure, Funding, Staffing Objectives and Implementation Tasks for Post-border

Key implementation tasks include:

- Propose legislative amendments to HRS § 150A-5 to authorize to screen, inspect, and regulate nonagricultural commodities. Partners: HDOT, DLNR, AG, HISC; Priority rankings: 1.
- Propose legislation to authorize HDOA to require use of e-manifest reporting and data management shipments. Partners: HDOT, DLNR, AG, HISC; Priority ranking: 1.

- Propose legislation to require vessels and waterborne equipment >5 feet long to conduct and document paper hull husbandry management. Partners: HDOT, USCG, DOH, HISC; Priority ranking: 1.
- Develop post-border aquatic and terrestrial emergency response plans. Partners: HISC, Invasive Species Committee (ISC), APHIS, CBP, USFWS, NPS, HDOT, US, HI-EMA, County; Priority ranking: 1.

Section 3.4: Public Awareness and Support

Key recommendations include:

- Enhance awareness and public engagement for biosecurity programs to detect, report, and contain pest/invasive species.
- Aquatic education specialists are tasked to target harbor workers, transportation industry and general public the messages about the harm done when live AIS are discarded.

Key Sections / Chapters

- Executive Summary
- 3.1.2 – 3.1.4 Policy, Process, Technology, Infrastructure, Funding, and Staffing Objectives and Implementation Tasks for Pre-border
- 3.2.2 – 3.2.4 Policy, Process, Technology, Infrastructure, Funding, and Staffing Objectives and Implementation Tasks for Border
- 3.3.2 – 3.3.4 Policy, Process, Technology, Infrastructure, Funding, and Staffing Objectives and Implementation Tasks for Post-border

Topic

Biosecurity

Document Title ***In-Water Vessel Cleaning: Current and Emerging Technologies, Associated Risks, and Management Options for Hawai'i (IWVC)***
Prepared by Chela Zabin, Ian Davidson, and Greg Ruiz
Prepared for Hawaii Department of Land and Natural Resources (DLNR), Division of Aquatic Resources (DAR)
Publication Date: 2016

Source http://www.cgaps.org/wp-content/uploads/Hawaii-In-Water-Vessel-Cleaning-Report-Final-123116.pdf

APA Citation Zabin, C., Davidson, I., and Ruiz, G. (2016). In-Water Vessel Cleaning: Current and Emerging Technologies, Associated Risks, and Management Options for Hawai'i. *Final report to the Hawaii State Department of Land and Natural Resources, Division of Aquatic Resources.*

Summary The IWVC assesses available and emerging IWC technology, risks associated with IWC, and initial data on IWC in Hawai'i. The report also identifies potential options for the management of IWC. Key information includes:

- Current IWC methods don't capture the removed biological and chemical debris, which creates a potential risk for biosecurity and water quality.
- IWC methods that kill but don't remove biofouling, such as heat treatment and encapsulation, reduce both risk of biosecurity and chemical pollution.
    - Section 2.2.2 Technologies to kill biofouling organisms – provides summaries of hot water/stream-based methods used to kill but not remove biofouling organisms.
- Most Hawai'i-based IWC companies are willing to use debris-capturing technology.
- Other potential IWC methods include more frequent hull cleanings, greater use of non-toxic coatings, and adaptation of the US Navy's best management practices (BMPs).
    - Section 2.2.1 Biofouling capture - provides a summary of 10 debris-capturing IWC technologies that are used nationally and internationally in California, Vancouver, Australia, Norway, Sweden, Denmark, and UK.
- To address biosecurity risks associated with IWC, actions include: promote sustainable approach to the practice, develop/encourage use of BMPs, education/outreach campaigns, incentivizing debris-containment technology, further data gathering, and developing a risk-assessment for IWC.

Key Sections / Chapters	• Executive Summary
Topic	Biosecurity

Document Title ***Hawai'i Sea Level Rise Vulnerability and Adaptation Report (HSLRVA)***
Prepared by Hawai'i Climate Change Mitigation and Adaptation Commission.
Prepared for Hawai'i Department of Land and Natural Resources
Publication Date: 2017

Source https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf

APA Citation Hawai'i Climate Change Mitigation and Adaptation Commission. (2017). Hawai'i Sea Level Rise Vulnerability and Adaptation Report. Prepared by Tetra Tech, Inc. and the State of Hawai'i Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawai'i Department of Land and Natural Resources Contract No: 64064.

Summary

The HSLRVA is the first statewide assessment of Hawai'i's vulnerability to sea level rise and its potential social, economic, and environmental impacts from chronic coastal flooding. Impacts were determined by modeling passive marine and groundwater flooding, coastal erosion, and annual high wave flooding under higher sea level. The report provides recommendations to reduce Hawai'i's exposure/sensitivity to sea level rise and increase the State's capacity to adapt. Based on the Intergovernmental Panel on Climate Change (IPCC) Assessment Report 5, global sea levels will rise by 3.2 ft by year 2100. The HSLRVA suggests planning for 3.2 ft of sea level rise now and be ready to adjust that projection upward.

Potential impacts in the sea level rise exposure area (SLR-XA) with 3.2 ft of increase would render 25,800 acres of land in the State unusable. The value of projected flooded structures, combined with the land value of the 25,800 acres, amounts to over $19 billion across the State. The $19 billion in economic loss doesn't account for costs incurred from chronic flooding of roads, utilities and other public infrastructure.

O'ahu
Key information includes:

- Potential economic loss based on value of land/structures is approximately $12.9 billion with 3.2 ft of sea level rise.
- By 2100, approximately 4,000 structures will be chronically flooded with 3.2 ft of sea level rise.
- More than half of the 9,400 acres located within the SLR-XA is urban lands, making O'ahu the most vulnerable of the islands.
- With 3.2 ft of sea level rise, approximately 18 miles of O'ahu's coastal roads would become impassible, jeopardizing access to and from many communities.
- Seawalls and other shoreline armoring worsen coastal erosion.

Beach protection policies should be implemented to reduce beach loss.

- Need a detailed economic loss analysis on O'ahu's critical infrastructure including Honolulu Harbor, airports, sewage treatment plants, and roads. State and County agencies should consider long-term cost savings from implementing sea level rise adaptation measures early, compared to the cost of maintaining/repairing chronically threatened infrastructure.

Key recommendations include:

- In County Plans, recognize SLR-XA with 3.2 ft of sea level rise as a vulnerability zone.
- Seek opportunities to plan new development outside of SLR-XA under a long-term comprehensive adaptation strategy.
- Design and siting of new development/capital improvement projects include analysis of sea level rise impacts based on elevation, tolerance for risk, and lifetime of the structure.

Key Sections / Chapters

- Section on Oahu (Sections are not numbered)

Lessons Learned

- Plan and design for a minimum of 3.2 ft of sea level rise.
- Use the SLR-XA website to visualize approximate impact of 3.2 ft sea level rise. Website link: http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

Topic

Resilience

Document Title ***Honolulu Port Analyses for the Hawaii Tsunami Scenarios***
Prepared by Martin & Chock, Inc.
Prepared for US Geological Survey Pacific Coastal and Marine Science Center and the Hawaii Emergency Management Agency (HIEMA)
Publication Date: 2017

Source N/A

APA Citation Martin and Chock, Inc. (2017). Honolulu Port Analyses for the Hawaii Tsunami Scenarios. Honolulu, Hawaii.

Summary

This report assessed the disruptive impacts of tsunamis scenarios to the Port of Honolulu. The study based the scenarios on two tsunamigenic sources from the Aleutian Islands and Kamchatka Peninsula and damage assessments were based on harbor currents, inundation depth onland, and flow velocity onland. The assessment includes damage and disruption to ports, cargo, vessels, port functionalities and trade.

Overview of Port of Honolulu Operational Facilities
This section identifies each pier's terminal function, berthing distance, and storage or open yard area. This section also shows the infrastructure at and near proximity to the pier including bridges and critical and noncritical facilities.

Tier 2 Hazmat Locations in the Vicinity:

- BEI Hawaii - Pier 32 Tank
- Department of Transportation-Sand Island Baseyard 48 Sand Island Access Road
- Industrial Chemicals and Lubricants Inc. 5 Sand Island Access Road, Building 930
- 158 and 180 Sand Island Access Road
- Aloha Petroleum

Critical Infrastructure:

- Sand Island Sewage Treatment Plant
- Kalihi Kai Fire Station Waiakamilo Road

Other Noncritical Facilities:

- HECO Honolulu Generating Station
- HECO Iwilei Fuel Storage Facility
- University of Hawaii Marine Center

Tsunami Inundation Analysis of the Port of Honolulu

This section describes the tsunami model and characterization, tsunami hazards, and the tsunami damage assessment.

The analysis utilized the NEOWAVE tsunami model to estimate the nature and magnitude of the tsunami impact to the Port of Honolulu from the possible event of a megathrust earthquake from either the Aleutian Islands (Mw 9.3) or Kamchatka Peninsula (Mw 9.1). Tsunami hazards can include container and/or fuel storage tank flotation (requiring less than 2 ft. of water), upward hydraulic pressure on piers and wharves, and damages associated with inundation. See **Figure 49** and **Figure 50** for the maximum water surface elevation and flow speeds produced by the Mw 9.1 Aleutian scenario and Mw 9.3 Kamchatka scenario.

Damage Assessment of Honolulu Harbor Key Facilities

The third section lists the principal flow characteristic and expected damages to the pier. See the following figures and tables:

- **Figure 51 – Key Facilities of the Port of Honolulu**
- **Table 2 – 86 Key Facilities of the Port of Honolulu**
- **Figure 52 – Maximum Flow Depths in meters, at the 85 Key Facilities**
- **Figure 53 – Maximum Flow Speeds at the 85 Key Facilities**
- **Table 3 – Aleutian Scenario Damage to Piers and Wharves**
- **Table 4 – Kamchatka Scenario Damage to Piers and Wharves**
- **Summary of Damage to Piers and Wharves**

Damage to the Port of Honolulu

This section covers the damage to the port of Honolulu from inundation (see **Figure 57 – Maximum Inundation Depths**).

- Pier 1 “Fort Armstrong” container yard would have depth exceeding 3 ft. Half of the containers would be displaced.
- Pier 39-40 “Young Brothers” container yard would have waves overtopping the loading and barge docks by 2 to 3 ft. All containers being staged for interisland barge would be displaced. This container yard presents the greatest hazard for waterborne debris due to barges that may not be evacuated prior to the tsunami.
- Pier 51-52 “Sand Island” container yard would be flooded by less than a foot of water. Containers are expected to remain in place unless impacted by other debris.
- Pier 51B-52 container handling dock would be impacted from high currents and waterborne debris. These piers would be nonfunctional and sustain damage including any gantry cranes and container handling trucks.
- Waterfront facilities and buildings would be damaged.
    - Honolulu Emergency Operations Center at Pier 2 would lose

power and may become inoperable.
    - The Kapalama Basin and drydock and ship repair facilities, and container freight station drydocks at Pier 41 may be uplifted and potentially broken free of their mooring.
    - The Aviation Fuel Tank farm would be overtopped by water exceeding 3 ft. and the entire farm would be flooded.
    - Nuuanu Stream mouth Kewalo Basin Annex– Piers 16 and 17 extending landward past Nimitz Highway and Iwilei Road into Aala Park would have overtopping tsunami flow up to 3 ft. This flow would destroy Piers 19 and 20.
    - "Fisherman's Village retail and restaurant structures adjacent to Pier 38 would have overtopping tsunami flow up to 3 ft. and become incapacitated by flow up to 5 ft. deep with limited structural damage.
- Pier 23 would most likely remain intact.
- Marine Fuel terminal next to Pier 30 should remain intact due to its containment walls. Walls should be evaluated for external loads and hydrostatic and hydrodynamic tsunami force.
- Nimitz Highway Kalihi Bridge deck would be overtopped by about 5 ft., and is likely to become blocked by debris.
- Sand Island Bridge should remain intact.
- Sand Island Sewage Treatment Plant would not be heavily flooded, but the mechanical and electrical equipment should be assessed to evaluate whether there would be disruption to waste-water plant operations.
- The Coast Guard facility and docks may receive up to 2 ft. of inundation, which should not be significantly damaging but may affect onshore operations.
- The Kalihi Kai Fire Station should be intact and unflooded and available for firefighting and rescue operations.

See **Table 6 – Aleutian Scenario Damage to Waterfront Facilities and Buildings** and **Table 7 – Kamchatka Scenario Damage to Waterfront Facilities and Buildings.**

<u>Piers and Wharves with Moderate/Major Damage or Greater</u>
This section shows a table of 18 piers with Moderate/Major to Complete damage. See **Figure 61 – Port Operational Areas with Major/Complete Functional Damage**. This section also describes the port capacity and supply chain.

- 4-day supply of fuel.
- 3010 tons per day of received food products are required to meet demand.
- Food supply is replenished every 5 to 8 days.
- 3-days of medical supplies.

- There are no heavy or dredging equipment permanently stationed for the port.
- Shipment from US mainland would be 7 to 10 days.

Assessment by Hawaii Emergency Management Agency

This section describes the assessment by the joint briefing on the tsunami damage projections from the scenarios at the Hawaii State Department of Transportation (DOT) Harbors Division with DOT management and HIEMA staff.

- Piers with the greatest importance are Piers 1 (international shipping yard), 19 and 20 (cruise ship operations), 29 (container-handling capable pier and 12-acre yard), 35 (University of Hawaii [UH] Research pier), 38 (Gas Company), 39 and 40-43 (container yard and interisland supply barge docks), and 51-53 (domestic shipping containers and automobiles).
- Main concern is to have alternative yards and roll-on roll-off terminal facilities available as operational contingency at up to 50% reduced capacity and efficiency overall.
- Tsunami damage from the scenarios is manageable at the Honolulu Harbor. Effects to the total supply chain and neighbor islands could not be assessed.

Conclusions and Recommendations

- Tsunami damage from the scenarios is manageable at the Honolulu Harbor with critical facilities that were not all severely damaged. Effects to the total supply chain and neighbor islands could not be assessed, but is expected to be disrupted.
- Main concern is to have alternative yards and roll-on roll-off terminal facilities available as operational contingency at up to 50% reduced capacity and efficiency overall.
- Piers with the greatest importance are Piers 1 (international shipping yard), 19 and 20 (cruise ship operations), 29 (container-handling capable pier and 12-acre yard), 35 (UH Research pier), 38 (Gas Company), 39 and 40-43 (container yard and interisland supply barge docks), and 51-53 (domestic shipping containers and automobiles).
- Piers 1, yard would lose half of its container.
- Piers 20, 35, 51, and 52 are completely damaged with respect to functionality.
- Piers 39 to 40 have major damage or are completely damaged with respect to functionality.
- It is strongly recommended that the containment walls of the Marine Fuel terminal next to Pier 30 should be evaluated for external loads resulting from both hydrostatic and hydrodynamic tsunami forces. These walls might be designed primarily for internal hydrostatic

pressures rather than compounded external hydrostatic and hydrodynamic pressures.

- The containment walls of the aviation fuel storage facility nearby to Sand Island Access Bridge should also be evaluated for external tsunami forces, and equipment and monitoring/control services need to be evaluated for flooding due to overtopping of these walls by the tsunami.
- Mitigation of tsunami risk to newer facilities should follow the ASCE 7 Standard, Chapter 6, Tsunami Loads and Effects, which is becoming a part of the Hawaii and Honolulu building codes.

Key Sections / Chapters

- Damage Assessment of Honolulu Harbor Key Facilities
- Damage to the Port of Honolulu
- Piers and Wharves with Moderate/Major Damage or Greater
- Conclusions and Recommendations

Topic Resiliency

Document Title	***Statewide Freight Plan*** Prepared by State of Hawai'i Department of Transportation, Highways Division Publication Date: December 2018
Source	https://hidot.hawaii.gov/highways/files/2019/03/HDOT_FreightPlan_FINAL.pdf
APA Citation	State of Hawai'i Department of Transportation, Highways Division. (2018). Statewide Freight Plan. Honolulu, Hawai'i.
Summary	The Hawai'i Statewide Freight Plan (HSFP) builds on previous work completed by DOT, including the HSTP, Statewide and Regional Long-Rand Land Transportation Plans, and other pertinent plans and studies that identify mobility conditions and issues for the State and major county road network in Hawai'i. In March 2018, the Maritime Administration of the U.S. Department of Transportation (USDOT) officially designated the waters around and between the Hawaiian Islands as Marine Highway 1 (MH-1), named the Daniel K. Akaka Marine Highway. This is the State's first Marine Highway designation and it enables the DOT's participation in the Federal Marine Highways program, which provides Federal resources to increase operation efficiency in moving cargo through the State's commercial harbors. The bulk of shipments between O'ahu and the other Hawaiian islands are conducted by Young Brothers using Honolulu Harbor as the hub. The HSFP prioritizes a grade separation/interchange project at the Nimitz Highway/Sand Island Access Road intersection.
Key Sections / Chapters	• Section 5: Freight Trends, Needs, and Issues • Section 6: State's Outreach and Decision-making Process • Section 7: Freight Improvement Strategies and Recommendations
Topic	Transportation

Document Title ***Hawaiian Islands National Shoreline Management Study***
Prepared by Craig Vogt, Inc.; CSRA, Inc.; and Eastern Research Group, Inc.
Prepared for U.S. Army Corps of Engineers Institute of Water Resources
Publication Date: 2018

Source N/A

APA Citation United States Army. Corps of Engineers, Institute for Water Resources (2018). Hawaiian Islands National Shoreline Management Study. Institute of Water Resources. Rep. No. 2018-R-08

Summary The report provides an assessment on the effects of erosion and accretion upon socio-economics, environment, and the management actions that are in effect as well as those that are needed to maintain resilient shorelines. This report also provides dredging history and general geological description of Kauai, Oahu, Maui and the Big Island.

Key information for shoreline erosion and accretion are listed below:

- Approximately 70% of beaches were eroding and 13 miles of beaches were lost.
- Statewide shoreline retreat is occurring at an average of 1 foot per year (0.3m/year).
- Current rates of sea level rise (based on 1905 to 2015 data) are 1.41 mm per year for Kauai and Oahu, 2.04 mm per year for Maui, and 2.95 mm per year for the Island Hawaii.
- Endangered sea turtles, monk seals, and bird species rely on beach habitats.
- Coastal armoring should be used as a last resort option.

Key information for socio-economic impacts from loss of beaches and erosion are:

- Approximately $20 million has been spent on dredging Hawaiian federal harbors since 1999, on average $1.8 million annually.
- Honolulu Deep Draft Harbor in 2016 dredged a total of 8,939 cubic yard in volume and cost $1,216,250.
- The State of Hawaii has been responsible for the majority cost of beach nourishment, roughly $3.5 million annually and total $35.2 million since 2007.
    - U.S. Army Corps of Engineers (USACE) funds 100% of O&M dredging at federal harbors.
- Annual tourism and recreation revenue associated with the shore is $6.2 billion.

Key information on management actions includes:

- Federal
  - USACE is facilitating the development of comprehensive assessments of Hawaii's sediment management needs and where regional sediment actions could be conducted.
  - Federal funds are limited or non-existent for shoreline management projects.
- State
  - A concern for the legal issue of takings of private property by government in the name of beach and shoreline management is growing as sea level rise threat increases. This concern is currently being researched by the University of Hawaii Sea Grant College.
- County
  - Both the County of Kauai and the County of Maui have established erosion based setback rules, as has the state for conservation districts.
  - City and County of Honolulu (CCH) has not adopted erosion-rate based setbacks beyond the 40 feet state minimum, due to the already developed land.
  - The CCH and Hawaii County have negotiable 55-foot setbacks.

Topic Resiliency

Document Title ***Infrastructure Trends, Primary Urban Center Development Plan***
Prepared by Wilson Okamoto Corporation
Prepared for the City and County of Honolulu
Publication Date: 2018

Source https://www.pucdp.com/copy-of-background-documents
APA Citation Wilson Okamoto Corporation. (2018). Infrastructure Trends, Primary Urban Center Development Plan. City and County of Honolulu.

Summary

This report discusses the existing infrastructure, deficiencies, and key trends of the transportation system and wet utility systems (water, wastewater, and drainage) related to sea level rise and climate change in Oahu's Primary Urban Center (PUC).

Transportation:

Major Transportation Policies, Programs, and Regulations

- Complete Streets
- Transit-Oriented Development (TOD)
- The O'ahu Metropolitan Planning Organization (OahuMPO)
- The Hawai'i Statewide Transportation Plan (2011)
- Statewide Pedestrian Master Plan (May 2013)
- Bike Plan Hawai'i (2003)
- Honolulu International Airport Master Plan (2010)
- O'ahu Commercial Harbors 2020 Master Plan (May 1997)
- Honolulu Harbor Master Plan

Key Transportation Issues in the PUC

- Increasing Congestion
  - Not feasible to build new or widen existing highways due to costs and lack of available space.
- System Preservation
  - Deterioration of road conditions.
  - Backlog of deferred maintenance projects.
  - Insufficient State and City funding for the maintenance of existing facilities.
- Safety
  - Particular areas of concerns are aggressive driving; impaired driving; safety of bicyclists and pedestrians, motorcycles, and mopeds; and reducing traffic-related deaths and injuries.
- Climate Change Resiliency
  - See **Figure 6: Road Network Vulnerability PUC East**.

Major Trends

- Multimodal Transportation
  - Investment in rail and TOD, bicycle plan, complete streets

initiatives, car sharing programs, and parking supply and demand.
- Autonomous Vehicles

Water Supply Infrastructure:

Major Water Supply Policies, Programs, and Regulations

- State Water Code
- Water Master Plan (2016)

Key Water Supply Issues

- Infrastructure Maintenance
  - Most potable pipelines in the PUC are made of cast iron or ductile iron. Ductile iron is stronger, but all the pipelines will wear out and corrode over time.
- Climate Change Resiliency
  - Saltwater intrusions in aquifers.
- Population Growth
- Water Quality
  - Vulnerable to contaminations from external pollutants.

Major Trends

- One Water Approach
  - Considers the water cycle as an integrated system (groundwater supply, stormwater, wastewater, and energy).
  - Consider integrating green infrastructures, Low Impact Development (LID), and conservation strategies related to sea level rise.

Wastewater Infrastructure:

Major Wastewater Policies, Programs, and Regulations

- Wastewater Facilities Plans
  - Sand Island Wastewater Facility Plan (October 2017)
  - Māmala Bay sewerage subdistrict (EIS) (2001)
- Consent Decree
  - Includes compliance checklist and schedule for the City to upgrade its wastewater collection and treatment system.
  - Agreement gives Honolulu until 2035 to meet secondary-treatment standards at the Sand Island Wastewater Treatment Plant (WWTP).

Key Wastewater Issues

- Infrastructure Maintenance
- Infiltration and Inflow
  - East Māmala
  - See **Figure 10: Wastewater Infrastructure and Sea Level**

Rise Vulnerability/ PUC East.

- Capacity
  - Existing areas are served or will be served by either the Sand Island WWTP or the Honouliuli WWTP and pockets of cesspools or septic systems.
- Climate Change Resiliency
  - Increase in infiltration, higher salinity levels, and higher corrosion rates of the pipes.
  - Sand Island WWTP is located at a lower elevation site (8 feet mean sea level) so gravity can be used to transport wastewater flows through the collection system and to have a shorter outfall pipe length.
- Cesspools
  - Untreated wastewater from cesspools can contaminate groundwater, drinking water sources, streams, and the ocean.
  - In 2016, there was ban on construction of new cesspools statewide.
  - Legislature passed Act 125 in 2017, which requires the replacement of all cesspools unless exempted.
  - See **Figure 12: Cess Pools in the PUC Plan Area / East**.

Major Trends

- Water Reclamation
  - Honouliuli Water Recycling Facility

Drainage:

Major Drainage Policies, Programs, and Regulations

- Clean Water Act
- State Water Code
- Rules Relating to Water Quality (City)
- User Fees
  - DFM is considering the implementation of user fees for the drainage system.
  - Involves charging monthly user fees to landowners based on the area of impermeable surfaces for each parcel.

Key Drainage Issues

- Flooding
  - Low-lying areas particularly prone to flooding during storm events as well as with high tides include Māpunapuna, Iwilei, Kapālama, Downtown (near Bishop Street), McCully-Mō‘ili‘ili and near the Ala Wai Canal.
  - An Iwilei-Kapālama Infrastructure Needs Assessment is being undertaken to determine the appropriate solution for frequent and severe flooding problems in the area.

    - DLNR plans to dredge the Ala Wai Canal in 2019.
    - Flood control projects in BWS reservoirs in Nu‘uanu are planned.
- Erosion and Water Quality
    - Runoff source discharge
- Climate Change Resiliency
    - Overburdened drainage systems from increased frequency and duration of heavy rainfall.
    - See **Figure 15: Stormwater Infrastructure Sea Level Rise Vulnerability / PUC East**.

Major Trends

- Low Impact Development
    - May help to reduce infiltration and inflow.
- Stormwater Reuse
    - Considerations for a closed drainage system.
- Renewable Energy
    - Pumped-storage hydropower is currently being tested on Kauai’s west side. However, limitations to PUC implementation would be the high costs and limited space.

Topic Resiliency

Document Title ***Learning to Build Resilience into Transportation Systems***
Prepared by Karl Kim, Oceana Francis, and Eric Yamashita
Published by the Journal of the Transportation Research Board
Publication Date: 2018

Source N/A

APA Citation Kim, Karl, Oceana Francis, and Eric Yamashita. (2018). Learning to Build Resilience into Transportation Systems. The Journal of the Transportation Research Board. doi: 10.1177/036119811878662 or https://journals.sagepub.com/doi/10.1177/0361198118786622

Summary The report identifies strategies for transportation agencies to respond/recover from natural disasters and improve the resilience of transportation systems. The report discusses eight case studies on natural and man-made disasters and identifies lessons learned from each scenario. Key findings include:

1. Transportation systems and services are critical to disaster response and recovery including search and rescue, emergency and medical services, communications, power, and critical infrastructure, law and order, and rebuilding and restoring communities following a disaster.
2. Communication across public and private sectors and the public is essential. It is also important to understand strategies for agencies to communicate with the public, e.g. media, social media, and other technologically-based formats.
3. Social media and other information technologies can facilitate immediate communication between agencies and the public.
4. Coordination of national incident management systems (NIMS) and incident command systems (ICS) can improve public and private coordination for improved tactical and operational effectiveness.
5. Risk and vulnerability assessment, planning, and pre-positioning of assets are essential for effective response and recovery.
6. Transportation officials need to support the integration of science, policy, and operations.
7. More attention to understanding and supporting the transportation needs of vulnerable, at-risk populations.
8. Transportation assets play a critical role in recovery.
9. Long-term, slow-onset, creeping disasters provide opportunities for innovation and change.

Topic Resiliency

Document Title ***Sea Level Rise and Climate Change, Primary Urban Center Development Plan***
Prepared by University of Hawai'i Sea Grant College Program
Prepared for the City and County of Honolulu
Publication Date: 2018

Source https://www.pucdp.com/copy-of-background-documents
APA Citation University of Hawai'i Sea Grant College Program. (2018). Sea Level Rise and Climate Change, Primary Urban Center Development Plan. City and County of Honolulu.

Summary

This report provides key trends, hazards, and vulnerabilities, and policy and planning considerations related to sea level rise and climate change in Oahu's Primary Urban Center (PUC). The report provides policy and strategic recommendations including case studies. This report uses assessment publicly available from the State Sea Level Rise Report in companion with the Hawai'i Sea Level Rise Viewer, State and City GIS programs, and recent scientific research from the University of Hawai'i. Primary authors of this report are Katy Hintzen and Dr. Brad Romine.

Key Sea Level Rise (SLR) Information:

- O'ahu is expected to see a SLR of 3.2 feet (ft.) and for extreme scenarios 6 to 8 ft. is plausible by 2100.
- With 3.2 ft. of SLR, impacts include chronic flooding of 1,727 acres of land, 1,627 buildings, displacing 4,325 residents, and flooding of 24 miles of road.
- A SLR of 3.2 ft. will have a high disproportionate economic impact on the PUC due to dense development on low-lying coastal lands and could potentially threaten $7.3 billion in buildings and property. The PUC accounts for 57% of O'ahu's total potential loss and 38% of Hawaii's total potential loss.
- TOD areas will experience chronic sea level rise flooding within this century and high tide flooding if no adaption measures are implemented.
- Rising SLR and groundwater inundation will reduce drainage capacity and contribute to risk of environmental impacts from compromised water and wastewater systems.

Key Information for Downtown to Honolulu Harbors:

Tsunami

The highest tsunami runup recorded was 13 ft. in the vicinity of Honolulu Harbor from the 1960 Chile earthquake and tsunami. The 2011 Japan tsunami caused no severe damage on land in the PUC but did cause some damage in marinas around Honolulu Harbor. See **Figure 16. Modeled hurricane storm surge inundation depths based on a category four hurricane striking urban Honolulu based on present day sea level** and **Figure 17. Modeled hurricane storm surge inundation depths based on**

a category four hurricane striking urban Honolulu with one meter (3.3 feet) of sea level rise.

Coastal Erosion and Beach Loss
Beach erosion hotspots in the PUC include the west end of Sand Island State Recreation Area, both ends and a central section of Ala Moana Beach Park, either end of Ft DeRussy Beach, Waikīkī (Royal Hawaiian) Beach, Queen's Beach, and portions of the Gold Coast – Diamond Head shoreline.

Flooding
Flooding is particularly pronounced at the mauka end of Pearl Harbor, Hickam Airforce Base and the reef runway, the industrial area of Māpunapuna, Ala Moana, Waikīkī, and makai portions of McCully-Mō'ili'ili. See **Figure 9. Exposure to chronic flooding with 3.2 feet of sea level rise in the Māpunapuna to Ala Moana region** and **Figure 12. Groundwater flooding from the airport through Waikīkī with 0.98 meters (3.2 feet) of sea level rise**.

Economic
Areas with the highest economic impacts include the industrial area of Māpunapuna, downtown Honolulu and Honolulu Harbor, Kaka'ako Makai and particularly Ala Moana and Waikīkī with their dense hotel, residential, and business/retail development. See **Figure 11. Potential economic loss (buildings and land, only) with 3.2 feet of sea level rise in the PUC area**.

Key Policy Information:
Relevant State and County Initiatives

- The 2018 update of the State Hazard Mitigation Plan
- Hawai'i Coastal Zone Management Act
- Greenhouse Gas Emission Reductions (State Act 234)
- The 2008 Hawai'i Clean Energy Initiative
- Hawai'i State Planning Act (as amended by State Act 286, 2012)
- Aloha+ Challenge (State Legislature endorsed in 2014)
- 100% Renewable Portfolio Standard by 2045
- Hawai'i Climate Change Mitigation & Adaptation Initiative (State Act 83, 2014 and replaced by Act 32, 2017)
- Hawai'i Sea Level Rise Vulnerability and Adaptation Report (December 2017)
- Honolulu Multi-Hazard Pre-Disaster Mitigation Plan
- Primary Urban Center Watershed Management Plan
- Honolulu Resilience Strategy
- Chicago Charter (2017)
- Honolulu Renewable Transportation Goals (2017)
- Mayoral Directive No. 18-2: Actions to Address Climate Change and Sea Level Rise (Issued July 16, 2018)

- City and County of Honolulu Climate Change Commission Guidance

Policy and Planning Considerations

- Climate change adaptation and mitigation strategies should be integrated into all aspects of the PUC DP, as O‘ahu must prepare for coming impacts while also addressing and minimizing the greenhouse gas emissions driving climate change.
- For planning decisions related to critical infrastructure with long expected lifespans or low risk tolerance, 6 ft. of SLR should be considered as a planning benchmark.
- The PUC DP should prioritize resilience actions that provide multiple benefits and strategically incorporate adaptation measures into ongoing projects and planning efforts.
- The PUC DP presents an opportunity to support and build on State and City efforts to reduce transportation-related greenhouse gas emissions (including a zero carbon fleet goal) and increase carbon sequestration (primarily through greater urban tree canopy).
- All City department and agency will be consistent with the Paris Agreement, Chicago Climate Charter and directive No. 18-2.

Recommendations and Adaptation Strategies:

- Consider 3.2 ft. of SLR (3.2 SLR-XA) for all planning decisions and 6 ft. of SLR for planning decisions with especially long lifespans or low risk tolerance.
- Support resilience actions that provide multiple benefits and align with policies and planning action.
  - O‘ahu Resilience Strategy
  - Updated City Hazard Mitigation Plan
- Design and siting of new development/capital improvement projects include analysis of sea level rise impacts based on elevation, tolerance for risk, and lifetime of the structure.
  - Rhode Island Coastal Resource Management (Case Study)
  - New York City Flood Resilience Text Amendment (Case Study)
- Consider prioritizing development outside of the 3.2 SLR-XA.
  - Florida Adaptation Action Areas (Case Study)
- Consider limiting rebuilding and implementing resilience requirements in vulnerable areas.
- Conduct vulnerability assessments for existing critical infrastructure
  - Broward County Comprehensive Plan (Case Study)
- Integrate sea level rise into capital improvement planning.
  - San Francisco Guidance for Incorporating Sea Level Rise into Capital Planning (Best Practices)
- Enhance community resilience through expanded parklands.
  - Wetlands Buffers in Massachusetts (Case Study)
  - Resource Guide for Planning, Designing, and Implementing Green

Infrastructure in Parks (Best Practices)

- Support beach preservation.
  - Waikiki Beach Special Improvement District (Case Study)
- Consider adopting design standards to enhance resilience in government buildings and public and affordable housing projects.
  - New York City Climate Resiliency Design Guidelines (Best Practices)
  - Strategies for Multifamily Building Resilience (Best Practices)
- Plan for disaster recovery.
  - FEMA Pre-Disaster Recovery Planning Guide for Local Governments (Best Practices)
  - Guidance for Disaster Recovery Preparedness in Hawai‘i (Best Practices)

Appendices

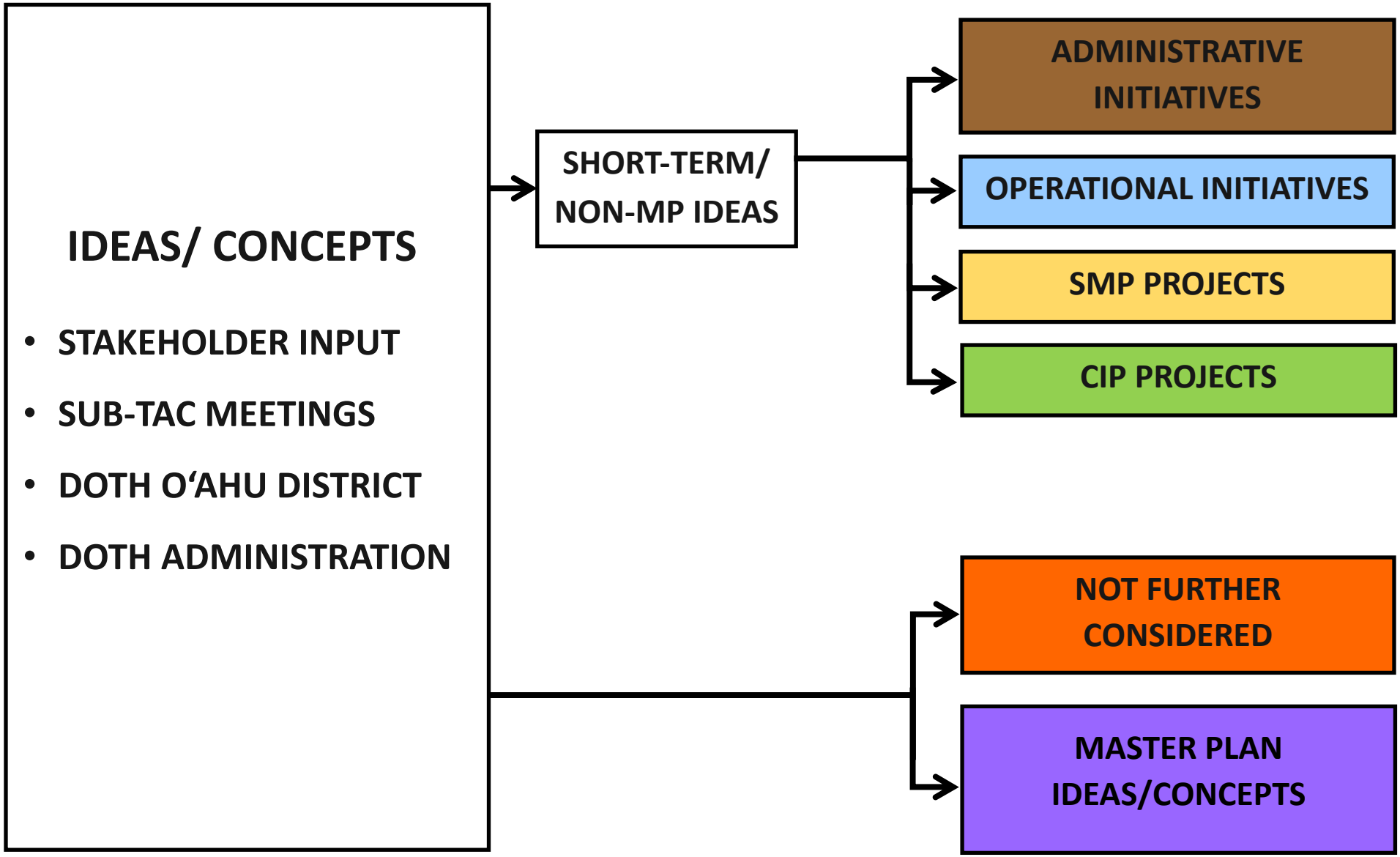
- Appendix A: Methods used in the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report
- Appendix B: City and County of Honolulu Directive No. 18-2
- Appendix C: Sea Level Rise Guidance

Topic Resiliency

APPENDIX H

MASTER PLAN IDEA VETTING PROCESS

Master Plan Idea Vetting Process



Note: There is overlap between the project categories. Some HHMP projects may be undertaken as DOTH initiatives or SMP or CIP projects.

Short-term/Non-Master Plan Ideas: **ADMINISTRATIVE/INTERAGENCY INITIATIVES**	
CONCEPT	**COMMENTS AND NOTES**
Establish Port Authority to increase administrative efficiencies.	
Provide long-term leases instead of revocable permits to maritime operators to encourage private capital investment in tenant facilities.	
Privatize terminal operations.	
Outsource management of the fishing piers to a private marine operator.	
Analyze the verified gross mass (VGM, i.e., manifests) and charge shippers for extra weight.	
Propose legislation to permit DOTH to invest in non-harbor infrastructure (e.g., roads and bridges) to support cargo movement as is done in some other ports.	
Consider long-term goal of requiring all vehicles and equipment at the harbor to be electric powered.	
Before displacing any operator, DOTH should identify an alternative location for the operator's consideration, with consideration given to the operator's utility and infrastructure needs to minimize disruption to their operations.	
Develop maritime fire-fighting capacity.	
Develop a dedicated in-water location for ballast water and hull fouling cleaning.	• A dedicated in-water location would not be required if using mobile technology. • An entity interested in providing that service can approach DOTH for a lease or RP for land/submerged land.
Prepare a harbor-wide environmental contaminants / hazardous material inventory and assessment.	• The State and its tenants currently report inventory and storage of hazardous materials (SARA Tier II). Assessments of hazardous materials are conducted as needed, as an on-going process.
Prepare a habitat conservation plan for Honolulu Harbor.	• Biological resources and habitat assessments are conducted as needed and as an on-going process with the development of harbors facilities.

Short-term/Non-Master Plan Ideas: **ADMINISTRATIVE/INTERAGENCY INITIATIVES**	
CONCEPT	**COMMENTS AND NOTES**
Coordinate with other agencies to develop plans for post-disaster recovery.	• Memorandum of Agreements (MOAs) should be used to clearly establish agency roles and responsibilities post-disaster. • Debris clearance and management is critical to post-disaster recovery. Having a MOA will prevent confusion post-disaster and quicken the debris removal and management effort. • Identify open space areas for emergency debris clearance and waste management.
Coordinate with other agencies to address climate change and sea level rise.	• Develop a regional storm water drainage master plan. • Work with DOT Highways Division and the City to develop adaptation strategies for intermodal connections and road networks (e.g., elevate roadways). • Protect critical infrastructure on/around Sand Island (e.g., the Sand Island Wastewater Treatment Plant, the aviation fuel tank farm along Sand Island Access Road, Island Energy Services' tank farm at Pier 30). • Evaluate development of an elevated seawall to protect harbor lands from inundation by storm surge and sea level rise.

Short-term/Non-Master Plan Ideas: **OPERATIONAL INITIATIVES**	
CONCEPT	**COMMENTS AND NOTES**
Remove derelict vessels.	• Until they can be removed, relocate derelict/inoperable fishing vessels to the Diamond Head side of Pier 16 since that pier has limited utility anyway (limited depth, and the pier is too narrow and not strong enough to support a fuel truck). • The Kulamanu and some derelict fishing vessels have recently been removed from the harbor.
Improve online scheduling system for scheduling and managing vessel movements in/out of the entrance channel.	
Adopt new technology for communication and position tracking among vessels and the harbor control tower.	
Provide storage and access space for the spare Single-Point Mooring (SPM).	• Par Hawaii berthed their spare/backup SPM at Pier 39 but was/is being relocated. It is not practical to move it out of the water because of its size and weight. Par Hawaii needs a space (a pier or dolphin) for storage and access to do maintenance work.
For the fishing fleet, designate active loading zones where vessels are allowed to berth only long enough for fueling and provisioning. Suggested locations are Piers 4 (if acquired from United States Coast Guard [USCG]), 8, 11 and 18 (after it is improved).	
Better education for tenants on emergency protocols during natural events that require evacuation of the harbor.	
Pier 11 Cruise Terminal needs a visitor booth and better wayfinding along Nimitz Highway.	
At Piers 10/11, develop staging area for buses.	• Pier 10/11 cruise terminal needs a staging area for about 10 buses and 6 mini-buses. Currently, only two, maybe three buses can fit at one time outside the terminal.
At Pier 22, install dolphins or Yokohama Fenders to expand berth capacity.	• Piers 22 and 23 are restricted in use by PSI's drydock operations at Piers 24 and 25 on the opposite side of the shared slipway. Drydock maneuvers and moorings use bollards at Pier 23 as anchor points. • Installation of breasting fenders or dolphins will allow deeper draft vessels to avoid subsurface rock outcroppings and use the pier for berthing.
Berthing time window at Pier 51 needs to be operationally extended for fuel discharge.	• Berthing time window at Pier 51 for fuel discharge is too short to unload a full tanker. Full discharge typically takes 36 hours.

Short-term/Non-Master Plan Ideas: **OPERATIONAL INITIATIVES**	
CONCEPT	**COMMENTS AND NOTES**
Move some uses from Honolulu Harbor to KBPH to free up space.	
Coordinate with USCG to install range aids (dayboards/night range lights) to denote the mid-channel navigational alignment of the Kapālama transit channel.	
Provide or increase security at Pier 14 and 19.	• Kirby has had issues with homeless, particularly at Pier 14. • Hawaii Pilots Association office area has had issues with homeless trespassing into their area and onto their boats.
Improve Functionality of the Pier 2 Cruise Terminal	
Provide employee parking, particularly for Norwegian Cruise Line's (NCL's) Saturday turnaround.	• It was suggested the "ballpark" parking area near the Immigration and Customs Enforcement (ICE) Building could be used for this purpose
Provide better traffic enforcement.	
Provide more and better signage inside and directional signage outside the terminal (e.g., To Chinatown, To Kakaako).	• Consider providing signage in foreign languages. On NCL's Pride of America, there is generally a low percentage of non-English speaking passenger; however, German and Japanese are the most common foreign languages spoken.
Allocate space at the terminal for greeting areas, welcoming programs and cultural programs/events for arriving visitors.	• The terminal entrance has limited gathering area and orientation materials for arriving visitors. • This is an opportunity to educate visitors about cultural, historic, environmental and other information that is important to Hawai'i and Hawai'i's residents.
Short of undertaking physical renovations, reorganize processes internal to the terminal to 1) relieve congestion in the lobby before the security checkpoint, and 2) make baggage drop-off more efficient.	• The terminal entrance has limited gathering area and becomes congested with arriving passengers and their baggage awaiting security screening at the single security checkpoint.
Identify alternative queuing locations for buses, taxis, and rideshares, similar to Daniel K. Inouye Airport cell phone/waiting lots.	

Short-term/Non-Master Plan Ideas: **SPECIAL MAINTENANCE PROGRAM**	
CONCEPT	**COMMENTS AND NOTES**
Maintenance Dredging	
Develop a schedule for proactive dredging.	• Dredging needs to be done before it affects pier usage, not after; it should be proactive, not reactive. • Increase frequency (i.e., at shorter intervals) of scheduled maintenance dredging. • Dredging of Piers 19/20 recently completed. • The following piers need dredging: 2, 15/16, 23 to 25, 26 and 27, 29, 37 and 38, 51, and 60.
Conduct routine bathymetry surveys to determine the rate of sediment build-up at each pier.	• Data can be used to prioritize dredging and develop dredging schedules based on sedimentation rates.
Water depths at Pier 16 are as shallow as 11 feet and need dredging to support fishing vessels.	• Phasing should consider that the following piers need addressing: 2, 15 and 16, 23 to 25, 26 and 27, 29, 37 and 38, 51, and 60.
Dredge Piers 26 and 27 slipway; it is currently about minus 15 feet due to sedimentation.	• Phasing should consider that the following piers need addressing: : 2, 15 and 16, 23 to 25, 26 and 27, 29, 37 and 38, 51, and 60.
Dredge Piers 28-30 to minus 36 feet along the pier face.	• Phasing should consider that the following piers need addressing: 2, 15 and 16, 23 to 25, 26 and 27, 29, 37 and 38, 51, and 60.
Dredge Pier 51 it is not deep enough along pier face to bring in a fully loaded fuel tanker.	• It is currently draft-restricted and can only accommodate ships up to a 39-foot draft maximum. • Note that the berthing time window at Pier 51 is not sufficient to discharge a fully laden fuel barge, which typically requires 36 hours at berth. • Phasing should consider that the following piers need addressing: : 2, 15 and 16, 23 to 25, 26 and 27, 29, 37 and 38, 51, and 60.
Repair/Replace Fendering	
Replace fendering at Piers 39 and 40.	
Fix fendering at the end of Pier 13 and 14 - about to fail.	
Develop a routine schedule for fender maintenance/replacement.	
Repair roof and gutters at FOSS/Kirby building at Pier 21	
Complete Pier 17 repairs.	• Pier 17 has been closed off for over a year with no repair work being done and boats are unable to tie up there. It needs to be reopened for fishing vessel berthing.

Short-term/Non-Master Plan Ideas: **CAPITAL IMPROVEMENTS PROGRAM**	
CONCEPT	**COMMENTS AND NOTES**
Dredging	
Water depths at the Piers 24 and 25 slip should be dredged to match the operational depth of the harbor.	• Current depth of slipway is approximately minus 30 feet and the design depth is 35 feet. Dry dock operator recommends that it be dredged to 45 feet minimum to allow for full operational range of the large dry dock. 45-foot depth exceeds the current design depth of the slipway and constitutes an expansion of capacity. • There is a high spot at the back of the drydock which prevents the dry dock from being positioned as far back in the slipway as desired.
Reconstruct, Strengthen and/or Modernize Piers	
Reconstruct and strengthen Piers 8 to 10, which have load restrictions.	• Piers 8 and 9 are the oldest in the harbor (over 100 years old) and are not designed to accommodate modern harbor operations.
Modify Pier 29 apron to accommodate a lower freeboard dock height that matches up with a midship barge ramp (similar to the cutaway dock ramp at Kalaeloa Barbers Point Harbor [KBPH] Pier 5A).	• Pier 29 is currently too high; barges cannot fully load as they would sit below the pier. • Repair and strengthen Pier 29 face. • User-specific improvement, make the terminal multi-purpose to serve a variety…..
Reconstruct the Pier 18 wooden dock, which is currently condemned.	• This could provide a loading dock for fishing vessels.
When improving commercial fishing piers, construct them to a standard required for fishing vessels, not cargo vessels	• Consider floating docks for commercial fishing piers.
Install modular, removable panels on submerged pier surfaces that promote growth of native species.	• Man-made, in-water structures tend to support non-native species. • Panels can be removed and relocated to restoration areas when the affected piers are repaired, reconstructed, or demolished.
Remove submerged objects at the Piers 22 and 23 area	• Improve usability of Piers 22 and 23 and slipway.
Completely remove Piers 32 and 33 sheds.	• Shed were removed in 2020.
Strengthen the pavement following the demolition of a structure	• When a warehouse is demolished for open yard space, the pavement on which those structures were located should be strengthened.
Upgrade Bollards	
Bollard standards should be enhanced to support the increasing size of vessels and varying environmental conditions.	• Some bollards are old and substandard for modern cargo operations. • The same standards should be applied to all ports statewide.

Short-term/Non-Master Plan Ideas: **CAPITAL IMPROVEMENTS PROGRAM**		
	CONCEPT	**COMMENTS AND NOTES**
	Develop a routine schedule for inspection, maintenance and replacement of bollards.	• Bollard integrity should be regularly assessed to systematically identify and replace underrated or damaged bollards. • Before installing bollards, consult operators so bollard sizing and placement (spacing intervals and distance from pier) meets their operational requirements.
	Upgrade bollards to their proper size, particularly at Pier 2 because 40-ton bollards are insufficient for cruise ships.	• Consult with the cruise industry to determine appropriate bollard ratings, number, and spacing to accommodate the increasing size and draft of new cruise ships. • Upgrade to 100 to 200 tons or as appropriate for cruise ships.
	Consider installing breasting bollards, especially at Pier 2 for cruise ships	• Breasting bollards are required to provide sufficient bollard strength needed to safely moor the cruise ships, in particular the larger cruise ships in service today and in the future. This is of particular concern due to the undersized and aged bollards currently affixed to Piers 1 and 2.
Fendering		
	Upgrade fendering at cruise terminals to accommodate the dimensions of newer cruise ships.	• Fenders should be white, black tires mar the ships' hulls and DOTH will not allow hull painting in the harbor
	Improve fendering at inter-island barge terminal piers.	• Consider using same fendering system as used at Nāwiliwili Harbor.
Upgrade/Install Utilities		
	At Pier 19 upgrade electrical at the Hawaii Pilots Association offices.	• The Hawaii Pilots Association facility taps into the adjacent warehouse power lines. They typically experience outages 1 to 2 times per month, so they have a backup generator to ensure they can maintain 24/7 operations.
	At Pier 18, upgraded electrical service is needed and the other side of Pier 17 requires new service.	• Only one side of Pier 17 currently has service.
	At Pier 21, water pressure is an issue and there is no dedicated shore-to-ship power for tugs.	• Currently only Foss tugs have shoreside power.
	At Piers 24 to 29 install utility lines.	• At Piers 24 to 29, conduits were installed, but for users the cost and time to bring in utility lines are prohibitive.
	At Pier 2, upgrade water system to provide adequate flow and pressure to support cruise vessels at berth.	• Existing water system lacks adequate pressure for shore-to-ship water service.
	At Piers 2, 5 to 8, 10 and 11, and 21 and 22 develop dedicated sewer connections to allow vessels to discharge wastewater to the municipal sewer system.	• Lack of wastewater connection limits cruise vessels time at berth and day excursion vessels must make special trips out to sea specifically to discharge wastewater.

Short-term/Non-Master Plan Ideas: **CAPITAL IMPROVEMENTS PROGRAM**		
	CONCEPT	**COMMENTS AND NOTES**
	Develop solar farms around the harbor to reduce energy costs.	• Look to Pacific Shipyards International LLC and Foreign-Trade Zones [FTZ) as examples.
Develop Facilities for Worker Safety Convenience		
	Develop comfort stations at appropriate locations throughout the harbor.	
	Develop emergency wash stations at appropriate locations throughout the harbor.	
	Provide fixed ladder system (or similar equipment) along the pier faces for emergency water exits/extraction.	• The freeboard on some piers, such as Sand Island Terminal, are quite high, which is why a fixed ladder system is important for emergency water exits/extraction.
Cruise Terminal Improvements		
	Reconfigure the interior of the Pier 2 Cruise Terminal to make better use of the space	• The terminal is huge, but it is underutilized and not efficiently laid out. Parts of the terminal are unused. • There is a lot of room inside the secured area, but it is too congested in the lobby before the security checkpoint. The security checkpoint should not be a bottleneck. • Spaces should be made more flexible to accommodate a variety of uses and operational needs of the various cruise line companies. • Passenger embark and debark should be completely separated. Provide direct access to baggage claim from the ship (i.e., preferable to not have debarking passengers traversing through the check-in lobby). • A more efficient baggage drop-off area is needed. Think about configuring the lobby space to help to differentiate between the lines for baggage drop-off and queuing for security. • Provide a luggage storage area in the terminal. Passengers debark in the morning but cannot check in to hotels or may have flights out later in the day and need someplace to store luggage. • Improvement costs based on mutual commitments
	Improve the Pier 11 shed where embarking/debarking passengers walk through to get to the passenger terminal	
	Improve the Pier 10/11 gangway	
	Pier 10/11 cruise terminal needs air conditioning and expanded holding space to comfortably accommodate passengers.	• Current conditions are congested and uncomfortable for a cruise terminal.
	Provide Wi-Fi at the cruise terminals.	

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Relocate Honolulu Harbor in its entirety to west side of Oahu. Convert Honolulu Harbor land to urban development.	• Not reasonable or feasible, economically or politically. • Does not align with MP goals - Does not preserve or optimize the use of Honolulu Harbor's finite land resource for industrial maritime use.
Develop decentralized power generation systems outside of Harbor's property (e.g., solar on top of nearby big box buildings) that could provide power to the Harbor in an emergency.	• Not feasible. - DOTH does not have control over property and facilities located outside of its boundaries.
Install barrier walls around the Sand Island Wastewater Treatment Plant, the fuel tanks on Sand Island Access Road and other high-risk facilities.	• Not feasible. - DOTH does not have control over property and facilities located outside of its boundaries. - Protecting off-site, non-DOTH facilities is not directly related to DOTH's mission.
Develop 15 to 20-foot-high storm surge sea wall around the Sand Island Container Terminal.	• Not economically reasonable or feasible. • May not improve harbor function. - May create surge problems elsewhere in the harbor due to displacement / redirection of surge water.
Develop new second harbor entrance lift bridges to accommodate normal operations of all commercial harbor traffic, including container cargo vessels. Operate the bridge on a schedule to minimize impacts to truck traffic to/from Sand Island.	• Not operationally feasible. - If operated on a routine basis (even on a schedule), a lift bridge would result in impacts to truck traffic to and from the Sand Island Container Terminal and would therefore adversely impact operational efficiencies for maritime users. (The lift bridge concept is included in the HHMP ideas, but considered for use only in emergency situations, not for routine cargo vessel traffic.) - A regularly operated lift bridge would also adversely impact other businesses located on Sand Island.
Develop new fixed bridge over Kalihi Channel with sufficient air draft to accommodate full-sized container cargo vessels.	• Not feasible based on the High Clearance Bridge Feasibility Report (2000 USACE). - Bridge draft/height require unreasonably long approaches and would require land acquisition. - Bridge would be restricted in height as it could conflict with the Daniel K. Inouye International Airport regulated air space.
Tunnel under Kalihi Channel for motor vehicle traffic.	• Sand Island Tunnel Reconnaissance Study (2006 USACE) resulted in a benefit-cost ratio (BCR) of 1.10, so the concept was deemed economically justified at that time. However, the study is 17 years old and conditions in the proposed project alignment have changed since the study was undertaken, including development of KCT, which

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
	makes the tunnel alternative, as previously proposed, infeasible and thus not advanced for further consideration in the HHMP. • A new tunnel alignment should be considered and analyzed in a new USACE feasibility study.
Replace the hub-and-spoke model with a direct shipment model. Develop emergency deep draft harbor facilities on Neighbor Islands that could serve O'ahu in an emergency.	• Outside the scope of the HHMP. - This issue can be explored as part of a future Statewide Commercial Harbors System Strategic Plan. - Alternatives to the hub-and-spoke model will be explored by the forthcoming Regional Resiliency Assessment Program (RRAP).
Create a ferry system. Bring back the Superferry.	• Not feasible. - It does not support DOTH's mission, which is to provide facilities for commercial maritime and related support operations; DOTH does not provide services. Currently there is no interested ferry system operator. - May not be economically feasible for the State to subsidize a fast ferry system.
Expand land area and develop KBPH to handle emergency cargo needs for the island.	• Addressing KBPH is outside the scope of the HHMP. - The KBPH 2040 Master Plan already designates KBPH as an alternate port to receive emergency cargo.
Expand scope of HHMP to consider statewide port system and support improvements of fuel tanks, warehouses and docks on Neighbor Islands.	• Planning for the statewide port system is outside the scope of the HHMP. - Due to procurement restrictions, the scope of the HHMP cannot be expanded. This issue can be addressed as part of the future Statewide Commercial Harbors System Strategic Plan. - As the hub of the state's commercial harbors system, improvements proposed by the HHMP will establish precedent for improvements at the Neighbor Island ports.
Develop a consolidated automobile/roll-on-roll-off (RO-RO) pier (Pier 1, 19 and 20, and/or 31 to 33).	• Does not improve the function of the harbor compared to developing flexible, multi-use piers. - Flexible terminals that have the ability to accommodate any ship and cargo type is preferred. - Consolidated auto terminal would result in split operations (containers at one pier and autos at another pier) which would affect operator efficiency. - Piers 19 and 20 may become the defacto preferred auto pier if the proposed the Maritime Center is developed with vertical parking structure for auto storage integrated with the Piers 19 and 20 cargo yard.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Develop individual weigh stations at major cargo terminals.	• Development of individual weigh stations is outside of the scope of the master plan. - Development of weigh stations is the responsibility of DOT-HWY. If requested by DOT-HWY, DOTH may provide land area within harbor property for weigh station development.
Develop one-way entry at Pier 52 gate and one-way exit at Pier 51 gate for container traffic to eliminate queueing on Sand Island Parkway.	• This is an operator issue and is outside the scope of the HHMP. - Terminal operator will determine internal vehicle circulation and queuing that best suit their operations.
Renovate the historic DOH building at Pier 2 for use as a visitor center and cruise passenger orientation center.	• Not economically reasonable. - The visitor center will only be used by a single vessel once a week on Saturdays for a large part of the year. What amount of resources should be committed to a building that will be under-utilized for extended intervals? - Building could be better utilized to improve harbor operations. Consider leasable office space for maritime operators.
Modify Pier 29 apron to accommodate a lower freeboard dock height that matches up with a midship barge ramp (similar to the cutaway dock ramp at Kalaeloa Barbers Point Harbor [KBPH] Pier 5A).	• Pier 29 is currently too high; barges cannot fully load as they would sit below the pier. • Repair and strengthen Pier 29 face. • User-specific improvement, make the terminal multi-purpose to serve a variety…..
Consider relocating the passenger terminal from Pier 11 to Pier 10.	• Not feasible. - The Pier 10 terminal is not large enough to efficiently manage passenger embark and debark, particularly in light of changing spatial requirements to address health and safety protocols.
Extend Piers 5 and 6 seaward and develop formal piers for excursion vessels or layberth.	• Does not align with Master Plan goal of balancing stakeholders' competing needs and interests (commercial maritime community with resource conservation objectives). - Coral transplantation site offshore from Piers 5 and 6 constrains makai extension of pier improvements. - Preference is to retain makai edge as natural shoreline for public access and enjoyment (e.g., fishing and views of the harbor).
Develop Piers 5 and 6 for maritime support in order to free up other areas of the harbor that are more suitable for cargo operations.	• Does not improve function of the harbor. - Maritime support operations would not be compatible with the public access and waterfront development use designated for the Aloha Tower complex. - Analysis indicates that Honolulu Harbor has sufficient space for cargo operations for the foreseeable future and relocating maritime support operations to Piers 5

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
	and 6 does not address a need or deficiency that cannot be addressed by other means (e.g., densification of operations, land acquisition, etc.).
Improve Pier 12 to relocate Hawaii Pilots.	• May not improve harbor function. - Hawai'i Pilots' operations may be restricted by lack of adequate employee parking and facility area, as well as by operational restrictions imposed by the Facility Security Plan when a cruise vessel is berthed at Piers 10 and 11. - Pier 12 may be better suited to another maritime support service operator; therefore this idea is modified for inclusion in the HHMP as Pier 12 improvements undertaken through a long-term lease with an unspecified maritime operator.
Develop statewide port system to accommodate 5,000+ passenger cruise ships at Honolulu Harbor and Neighbor Island ports.	• Outside the scope of the HHMP. - This issue can be explored as part of a future Statewide Commercial Harbors System Strategic Plan. • Potential adverse environmental impacts. - Extremely large cruise vessels could overwhelm Neighbor Island communities and exceed their carrying capacity to handle huge influx of cruise passengers.
Install pier-side ballast water exchange tanks and develop an emergency ballast water pump out system that discharges to the City and County of Honolulu (CCH) sewer system.	• Not operationally feasible. - CCH does not accept salt water in their wastewater treatment facilities. - Ballast exchange tanks would be considered operator equipment and not DOTH's responsibility to provide.
Develop parking structure at the Commercial Fishing Village.	• Not operationally feasible. - Landside improvements within the Commercial Fishing Village is controlled by the Fishing Village AOAO, which is planning to improve vacant parcels for additional surface parking.
At Pier 37, remove revetment and replace the T-pier with a regular pier or reconstruct the pier to allow berthing on both sides to provide additional berthing for fishing vessels.	• Does not improve the function of the harbor. - To allow berthing on both sides, the pier would have to pushed further away from the revetment, towards Pier 36, which will impede navigation between Piers 36 and 37. • Not economically reasonable. - For the amount of investment, the harbor would not gain that much more berthing area.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Relocate commercial fishing vessels and landside support facilities (auction house, ice factory, fishing vessel provisioning services) to Keʻehi Lagoon in the vicinity of Pier 60.	• Not reasonable or feasible. - Does not recognize the Commercial Fishing Village's existing long-term lease, which extends to 2064. - Relocating fishing vessels would require opening of the second harbor entrance to facilitate transit to/from Pier 60 to the Commercial Fishing Village - This idea is not recommended within the current 30-year master plan horizon but may be referenced for consideration in the next master plan. - Don't split fleet and services/auction
When it's time to replace Pier 37, consider moving the pier further away from the revetment to create more berthing space for fishing vessels.	• Moving the pier further into the slipway will reduce space in the slipway required for navigation and berthing at Pier 36. Also, the T-shape of the Pier 37 dock will limit interior berthing adjacent to the revetment with a vessel on the inside end of the pier effectively blocking access to other vessels.
Develop parking structure at Pier 19.	• Not economically feasible. - A stand-alone parking structures is not economically feasible. • Does not align with Master Plan goals. - Does not optimize use of finite harbor lands. The preferred option is to integrate a parking structure with development with other uses, such as a new maritime center at Piers 22 and 23. • Does not improve the function of the harbor. - Developing a flexible, multi-use pier at Pier 19 would better serve the overall function of the harbor.
Relocate the Foreign Trade Zone	• Not reasonable or feasible - The FTZ is not within DOTH jurisdiction or control. - Does not recognize existing land agreements. FTZ tenure at Pier 2, including the adjacent parking lot on Channel Street is granted by Governor Executive Order Nos. 3316 and 3317. - Federal Economic Development Administration (EDA) grant funds were used in building and renovating the Homer A. Maxey International Trade Resource Center wing of the FTZ Pier 2 facility. Federal grant requirements state the facility must remain in use for the grant's stated purpose for the projected life of the facility.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Relocate cargo operations and secured areas/uses from Piers 1 and 2 to Sand Island to create more area for public waterfront access. Develop Piers 1 and 2 with mixed-use waterfront development.	• Does not align with Master Plan goals. - Does not preserve and optimize use of Honolulu Harbor's finite land resources for industrial maritime purposes. - Degrades ability to ensure resiliency. Piers 1 and 2 because of its location at the harbor entrance has been identified as a key location for staging emergency response following a disaster event. Converting those piers for waterfront development lessens the harbors resilience capabilities. • Does not improve function of the harbor. - Permanently removing a cargo terminal from service would have long-term impacts on the functionality and operational efficiency of cargo operations in the harbor. • Not operationally feasible. - Relocating >33 acres of passenger and container operations to Sand Island creates congestion. - Sand Island is not a conducive location/environment for cruise operations. Sand Island is an industrial area, there are no walkable points-of-interest, and public transportation is limited or non-existent.
Develop pedestrian crossing from Pier 2 Cruise Terminal to Sand Island by means of underwater tube.	• Not operationally or economically feasible. - It has the potential to create a navigational hazard. • Does not improve the function of the harbor. - Does not address any harbor deficiency or need. - High-cost project that does not improve any harbor function.
Terminate HPU lease at Aloha Tower and repurpose area for public retail/restaurant/commercial uses.	• Not reasonable or feasible. - Does not recognize existing HPU's long-term lease with ATDC, which extends beyond the HHMP's planning horizon.
Relocate the Fish Auction to Pier 20.	• Not reasonable or feasible. - Does not recognize the Commercial Fishing Village's existing long-term lease, which extends to 2064, beyond the HHMP's planning horizon. - Not economically reasonable given the level of private investment in the Commercial Fishing Village facilities.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Develop pedestrian bridge(s) at various points along Nimitz Hwy/Ala Moana Blvd (e.g., at Pier 2 to Restaurant Row).	• Not reasonable or feasible. - Improvements would be outside of DOTH jurisdiction or control, including DOT-HWY right-of-way and private property. - DOT-HWY and CCH Department of Transportation Services noted that it is much more cost effective to spend funds on at-grade crossing improvements rather than pedestrian bridges. • Does not improve the function of the harbor.
If Pier 4 is acquired from USCG, fill in Piers 4 and 5 slip to create a continuous land mass extending from Pier 4 to 6, as well as infill mauka end of slipways between Piers 6 and 7, and 7 and 8 to increase land area for development, create a promenade and enhance connectivity between Pier 2 and Aloha Tower.	• Not reasonable or feasible. - Currently DOTH does not have jurisdiction or control over Pier 4 and USCG has not given any indication they would be willing to part with Pier 4. • Does not improve harbor function. - Does not address a deficiency or need. • Potential adverse environmental impacts. - Corals and other natural resources will need to be considered should any infilling occur.
Acquire Pier 4 from the USCG and demolish a portion of the building and pier to extend the Pier 2 cruise ship berth into the Piers 4 and 5 slipway.	• Not reasonable or feasible. - Currently DOTH does not have jurisdiction or control over Pier 4 and USCG has not given any indication they would be willing to part with Pier 4.
Incorporate HECO property into Aloha Tower redevelopment.	• Not reasonable or feasible. - HECO property is outside of DOTH jurisdiction or control, and the site is not available for acquisition or exchange with DOTH. - A portion of the site is still in active use (substation), while the other portion is deactivated but not decommissioned. HECO is contemplating use one of the buildings to install synchronous condensers.
Redevelop Pier 19 ferry terminal as a destination. Ideas include an aquarium or a fish market.	• Does not improve function of the harbor. - Does not address a deficiency or need and will not make maritime operations more efficient. • Does not align with Master Plan goals. - Does not optimize use of Honolulu Harbor's finite land resources for industrial maritime use.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
At Piers 21 and 22, replace or extend existing piers with strengthened finger piers for commercial utility vessel berthing.	• Not reasonable or feasible. Does not improve function of the harbor. - Finger piers at this location will extend into the federal project limit and affect navigation in the main turning basin.
Develop Pier 60 as a marina for shallow-draft vessels to free up more space in the harbor for deep-draft cargo vessels.	• Not economically reasonable or feasible. - Re-opening the second harbor entrance with a new bridge with sufficient air-draft (approximately 80 feet) for passage of shallow-draft vessels and barges is pre-requisite for developing a Keehi Lagoon marina for fishing vessels and/or work boats. The second entrance will reduce shallow-draft vessel traffic through the main harbor entrance. - Does not recognize the Commercial Fishing Village's existing long-term lease, which extends to 2064, beyond the HHMP's planning horizon. This alternative could be considered for the post-2050 planning horizon after the Pier 38 fishing village lease expires. Until that time, fishing vessels need to continue to transit through Honolulu Harbor to Pier 38 for the fish auction and provisioning.
Realign Piers 24 and 25 by removing a portion of angled pier face so it is parallel with Piers 22 and 23, which would increase the efficiency of the slip area.	• Not economically reasonable or feasible. - Costly improvement for marginal improvement in use of the slipway. - Land area required for this improvement is under long-term lease with PSI, past the HHMP 2050 planning horizon. - Proposed improvements to Piers 22 and 23 will help increase efficiency of the slip area.
Create additional berthing capacity for a dry dock or tug boats at Pier 21 by constructing a notch or finger piers.	• The improvement will not make maritime operations more efficient and minimize cost increases to the community. - Finger piers would encroach into the basin affecting navigation. - Cutting a notch would not gain much more berthing space and would sacrifice valuable landside area.
Relocate the water bottling plant out of the harbor property.	• Not reasonable or feasible. - Does not recognize Toell's long-term lease, which lease extends beyond the HHMP's planning horizon. - Not reasonable given the level of private investment to renovate the facility.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
Relocate the water taxi service to Pier 12.	• Not operationally feasible. - The land area is too small for the operation. - Delivery and fuel trucks would back up along Nimitz Highway. - The 24/7 operations would be disruptive to residents across Nimitz Highway.
Demolish all structures on Piers 7 to 11 and redevelop the piers for maritime use.	• Not reasonable or feasible. - Does not recognize existing long-term leases and other land agreements. ATDC and sublessees have leases that extend beyond the Master Plan horizon. - Requires demolition of Aloha Tower, which is listed on the National Register of Historic Places (NRHP) and the State Register of Historic Places (SRHP) and demolition of Irwin Park and Piers 10 and 11, all of which are listed on the SRHP. - Public sentiment against this action would create political liability for State government. • Potential adverse impacts. - Negative impacts to adjacent Downtown Business District and Ala Moana Boulevard /Nimitz Highway from industrial maritime use at Piers 7 to 11, including traffic, noise, and lighting. • Does not align with Master Plan goals. - Would eliminate one of only two locations in the harbor suitable for public access to the waterfront.
Acquire the DLNR-DAR facility on Sand Island for commercial/industrial maritime use.	• Does not align with Master Plan goals. - Does not balance stakeholders' competing needs and interests. DLNR-DAR's Anuenue Fisheries performs an essential function by supporting ecological conservation measures and DOTH's mitigation efforts (coral out-planting) required for its regulatory compliance.
Relocate IES and Aloha Gas fuel tanks from Pier 30 to Sand Island.	• Not reasonable or feasible. - DOTH does not have control over the property and facilities located outside of its boundaries.
Develop new vertical parking structures at the "ballpark" parcel (DOTH jurisdiction), or at the FTZ parking lot through a joint-development.	• Not reasonable or feasible. - ICE occupies the adjacent property and has stated that they do not want a multi-story structure next to their facility for security reasons. - Previous attempts by FTZ to develop their parking lot met with resistance and was rejected by the legislature. Can anticipate similar resistance to development proposals in that area, makai of Ala Moana Blvd. • Potential adverse environmental impacts.

NOT FURTHER CONSIDERED	
CONCEPT	**RATIONALE FOR ELIMINATION FROM FURTHER CONSIDERATION**
	- The "ballpark" is adjacent to a historic property, so consideration of the historical context/setting could restrict vertical options.
Improve pedestrian promenade/sidewalk fronting Pier 11 along Aloha Tower Drive and Nimitz Highway. Consider extending promenade across Nimitz Highway to Walker Park. 2040 plan with roadway widening. NFC	• Specific pedestrian improvements will be determined by ATDC in coordination with a private developer. • These improvements would conflict with or exacerbate problems with passenger ground transportation if cruise operations remain in this location.
Develop additional berthing (e.g., floating dock) adjacent to Nimitz, between Piers 15 and 16.	• The improvement will not make maritime operations more efficient. - This location is at the outfall of Nu'uanu Stream and susceptible to sedimentation and damage to dock facilities and vessels from debris in drainage discharges, thereby increasing maintenance costs and liability.
Extend Piers 16 and 17 to the federal project line to create additional berthing.	• Not operationally feasible and would not improve the function of the harbor. - The pier extensions will obstruct large vessel operations at Piers 19 and 20.
Repurpose the existing Sand Island weigh station to serve as a joint-agency shared inspection station. The weigh station will become obsolete with the imminent installation of weigh-in-motion technology at each of the cargo terminals.	• Not feasible. - This site is not available; DOT-HWY still intends to operate Sand Island weigh station, even with the development of the new weigh station on Sand Island Access Road, outside of KCT. - Currently, weigh-in-motion technology cannot replace the physical weight stations.
Develop layberth facilities at Slipper Island or other areas in Keehi Lagoon. Consider (i) sentinel buoys, (ii) dolphins, or (iii) mooring platform.	• Not reasonable. - Very costly to develop due to regulatory requirements and environmental conditions, with limited benefit in comparison to other layberth alternatives within Honolulu Harbor. - Location is susceptible to waves and surge that would impact layberth infrastructure and moored vessels. - DOT Airports receive funding from the FAA for the seaplane runways and as a condition those areas must be maintained sea plane runways.
Add a dolphin at the end of Pier 21 to increase the effective berth length of Pier 20.	• Not operationally feasible. - Would encroach into the basin and interfere with tug boat operations at Pier 21.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Improve piers and yards for flexible, multi-use operations. - Piers 1 and 2, 19 and 20, 29, 31 to 34	• Improves function of the harbor. - Flexible, multi-use terminals have the ability to accommodate any type of vessel and cargo.
Provide long-term leases instead of revocable permits to maritime operators to encourage private capital investment in tenant facilities.	• Improves function of the harbor - Private capital investment may result in improved maritime facilities and related operational function throughout the harbor without relying on the Harbor Special Fund.
Develop maritime fire-fighting capacity.	• Improves function of the harbor. - Improves safety in the harbor and safety for maritime fire responders through specialized training and equipment..
Upgrade and strengthen piers, aprons, fenders and bollards.	• Improves function of the harbor. - Many of the harbors' piers are very old and were not designed for modern cargo operations. Upgrades would allow for more efficient and safe use.
Elevate piers to account for sea level rise. Use adaptive design principles to ensure that pier improvements can accommodate future adaptation improvements.	• Improves function of the harbor. - Rising sea levels will reduce the functional pier deck freeboard, which will hamper vessel and cargo operations. Elevating piers is needed to maintain the required freeboard for continued operations as sea levels rise.
Identify and develop a flexible use area to temporarily relocate and maintain operations that will be displaced while other piers and yards are being repaired/upgraded.	• Improves function of the harbor. - Allows for continued harbor operations with reduced impacts to operators during major upgrades/repairs to harbor facilities.
Expand offshore anchorages.	• Improves function of the harbor. - Addresses need for additional anchorages for vessels waiting for berth space in the harbor.
Develop more layberth facilities.	• Improves function of the harbor. - There is need for berthing. Current berth utilization in Honolulu Harbor is 58 percent. Berth utilization rates over 50 percent for unscheduled and 60 percent for scheduled berths are considered at capacity, based on industry standards. Beyond that percentage, the berth is experiencing congestion and the need for additional berth capacity is indicated.
Where feasible, replace revetments and dolphins with regular piers.	• Improves function of the harbor. - There is significant need for berthing, and revetments and dolphins limit the kind of operations/activities that can occur in those locations. Any place with a revetment should be replaced by a proper pier. Piers are preferred over dolphins to accommodate a wider range of vessels.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Deepen the operational draft of the harbor (basin and pier side). Based on the preliminary channel widening study, the maximum design vessel draft is 39 FT (container cargo and petroleum vessels). For areas of the harbor exposed to waves the recommended harbor draft depth is 44.9 FT (115 percent of the vessel draft). For sheltered areas of the harbor, the recommended draft depth is 42.9 FT (110 percent of the vessel draft).	• Improves function of the harbor. - Deeper draft will allow the harbor to accommodate larger modern vessels. It will also support Honolulu Harbor as a mid-Pacific way station for emergency stops to repair large vessels that would not normally call at Honolulu Harbor. - Deeper drafts along the pier face would provide operational flexibility by accommodating a greater variety of vessels.
Widen Kapālama Channel or construct notch along Piers 32-34 to allow a wide vessel to berth without impeding vessel movement through Kapālama Channel.	• Improves function of the harbor. - Increases safety factor for large vessels transiting the channel, especially when there are other vessels simultaneously berthed on both sides of the channel.
Reopen second harbor entrance.	• Improves function of the harbor. - A second entrance increases the harbor's resiliency by allowing for continued vessel movement in and out of the harbor should the Main Entrance Channel become blocked after a disaster event. - Would relieve congestion at the Main Entrance Channel by providing a transit route for smaller, lower air-draft vessels such as fishing boats, tug boats and barges.
Widen existing Main Entrance Channel.	• Improves function of the harbor. - Increases safety factor for large vessels entering the harbor, particularly when another vessel is berthed at Piers 1 or 2 and is bunkering.
Provide dedicated pier locations to consolidate maritime support operations (e.g., tugboats, pilots, ship repair and ship maintenance).	• Improves function of the harbor. - Consolidating similar operations facilitates efficient operations by improving the organization of uses in the harbor. - Consolidating similar operations allows groups of smaller operators to benefit from economies of scale when developing facilities.
Develop hardened, multi-level, high-cube structures at select locations in the harbor, where emergency equipment (e.g., generators and fuel tanks) can be pre-staged during disaster events. Structures can be developed as part of a maritime center or other facilities so that it has utility outside of disaster events.	• Aligns with Master Plan goals. - Having equipment pre-staged at the harbor helps to ensure the harbor's resiliency and ability to restore function after a disaster event. After a disaster even, roads could be impassable constraining the ability to get emergency equipment to the harbor.
Create multi-level parking structures, as a component of mixed-use facilities.	• Aligns with Master Plan goals. - Surface parking uses too much space. Multi-level parking would help to optimize use of the harbor's finite land resources. • Improves function of the harbor. - Addresses the need for parking for maritime operations employees.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Develop an emergency entrance (e.g., a boat ramp) for pilots, jet skis and other emergency water vehicles.	• Improves function of the harbor. - Enhances safety for harbor users and maritime operations.
Remove old and underutilized structures/sheds. - Sheds and warehouses at Piers 19, 23, 24, 31 to 33.	• Improves function of the harbor. - Removing old and underutilized structures allows for the creation of open, flexible use yards for more efficient operations. - Increases safety for maritime users.
Provide space for development of joint-agency, shared inspection facilities at the major cargo terminals (Sand Island, KCT, Interisland, and Piers 1 and 2).	• Aligns with Master Plan goals. - Protects the environment.
Designate alternate terminal for overflow or unscheduled calls by cruise ships.	• Aligns with Master Plan goals. - Supports a commercial maritime constituent industry. • Improves function of the harbor. - Provides a safe, planned back-up berth for cruise vessels to use if compelled to do so due to weather, emergency or other unforeseen event that prevents them from a scheduled berth at another harbor.
Designate Pier 1 as the harbor's primary resiliency pier with associated improvements to support emergency relief operations	• Aligns with Master Plan goals. - Helps to ensure the harbor's resiliency after a disaster event. As the cargo terminal closest the Main Harbor Entrance, Pier 1 would be the least impacted by sunken debris and other obstructions in the harbor basins.
Develop an additional cruise berth at Pier 1 with consolidated terminal facilities at Pier 2 when Pasha relocates to the Kapālama Container Terminal.	• Improves function of the harbor. - Could increase efficiency with the consolidation of cruise operations at one location. • Aligns with Master Plan goals. - Balances competing needs/interests of the cruise industry and ATDC.
Modernize the Piers 1 and 2 Yard for multi-purpose cargo and resiliency pier / emergency staging use.	• Improves function of the harbor. - Prepares terminal for designation as the harbor's primary resiliency pier. - Improves the terminal for potential future operator, which would increase competition to the benefit of the community.
Cut back Pier 1 to fast land and shift the knuckle between Piers 1B and 2A mauka.	• Improves function of the harbor. - Increases safety of harbor operations by widening the Main Entrance Channel, which would allow for berthing of cruise or other large vessels at Pier 1 with bunkering operations and still maintain a safety margin for ships transiting the channel.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Expand harbor property and/or reduce conflicts with industrial harbor uses by acquiring or gaining use of nearly land areas, as opportunities present themselves.	• Improves function of the harbor. - Area land side (mauka) of Piers 31 to 33 (Honolulu Freight, HECO, etc.) would provide space for additional maritime tenants or for expansion of the Piers 31 to 34 cargo terminal. - OHA warehouse adjacent to the Pier 1 yard and the strip of HCDA land at the Pier 1 gate would provide for expansion of and improve operations at the terminal. - GSA lot at Pier 2 would allow for expansion and reconfiguration of vehicular circulation and staging for the cruise terminal. - Hale Mauliola transitional housing site would allow for expansion of the Sand Island Container Terminal Annex. • Aligns with Master Plan goals. - Adds to the inventory of the harbor's finite land resources.
Provide more parking, improve vehicular circulation, and improve pedestrian facilities and connectivity at the Pier 2 Cruise Terminal.	• Improves function of the harbor. - Will help to relieve congested circulation conditions and improve the functionality and efficiency of the cruise terminal. - Enhance safety and wayfinding for cruise passengers. • Aligns with Master Plan goals. - Balances needs of cruise operation with the adjacent FTZ by reducing impacts to FTZ operations and traffic flow on Channel Street.
Increase provisioning and staging areas for containers and service trucks at the Pier 2 Cruise Terminal.	• Improves function of the harbor. - Will reduce pier side congestion in areas used for cruise vessel servicing and improve the efficiency of ship provisioning operations.
Develop Piers 5/6 area with multi-level, mixed-use structure that could potentially contain offices for maritime operators and other businesses, hotel space, passenger orientation facilities, event space, a cultural and/or educational center, retail/commercial and parking.	• Aligns with Master Plan goals - Promotes public access and waterfront development at an appropriate harbor location, adjacent to downtown Honolulu and a future rail station. - Development balances the needs of ATDC, maritime operators, and the general public by providing for their various interests.
Improve waterfront promenade between Piers 5 and 11.	• Aligns with Master Plan goals - Promotes public access and waterfront development at an appropriate harbor location, adjacent to downtown Honolulu and a future rail station.
Modernize Piers 10 and 11 Cruise Terminal.	• Improves function of the harbor. - Existing terminal is too small and congested; redevelopment could transform the terminal into a modern facility with improved passenger and vehicular circulation, and improved provisioning space.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Repurpose the Piers 10 and 11 sheds for commercial/office use, which could include retail, restaurants, entertainment venues, exhibition space, meeting / conference space, etc.	• Improves function of the harbor. - Revitalizes underutilized space and would enhance revenue for ATDC, and thus DOTH. • Aligns with Master Plan goals - Promotes public access and waterfront development at an appropriate harbor location.
Improve Pier 12. Replace the segmented pier with a continuous pier. Consider extending the pier to create more berth space.	• Improves function of the harbor. - Replaces purpose-built pier designed for a specific vessel with a pier usable by all vessel types. - Potential pier extension would expand berth capacity to accommodate a dedicated maritime operator with more berthing needs (larger fleet or larger vessels).
Modernize Piers 13 and 14 shed to meet contemporary needs of maritime operator. Maintain historic attributes and character of the building when renovating/redeveloping.	• Aligns with Master Plan goals - Supports maritime support service operations. • Improves function of the harbor. - Renovation/redevelopment would modernize an outdated facility to meet contemporary maritime operator needs, rather than requiring work-arounds to adapt to the constraints of an aged building.
Develop respite center at Piers 16 to 18 for commercial fishermen.	• Aligns with Master Plan goals. - Supports commercial fishing operations and provides for health and safety of fishing vessel crews.
Modernize Piers 19 and 20 to serve as an open, flexible, multi-use cargo terminal.	• Improves function of the harbor. - Multi-use cargo terminals provide flexibility in berthing assignments, which enhances the overall operational efficiency of the harbor. - An improved terminal could serve as a secondary resiliency pier.
Designate Pier 21 as dedicated tugboat row. Modernize piers, strengthen aprons and develop new shared structures for office, warehouse and maintenance functions to support tugboat operations.	• Improves function of the harbor. - Improvements will correct current facility deficiencies to support modern tug boat operations. The Pier 21 apron cannot support crane and truck operations to replace tug boat tow cables. Because Pier 21 cannot support the weight, a special crane has to be brought in to span the 20-foot-wide apron. - Consolidating similar operations facilitates efficient operations by improving the organization of uses in the harbor. - Consolidating similar operations allows groups of smaller operators to benefit from economies of scale when developing facilities.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Reconstruct Piers 22 and 23, to include cutting back the pier face to increase the width of the slipway and clearing the subsurface rock outcroppings that restrict berthing deeper draft vessels.	• Improves function of the harbor. - Will make Piers 22 and 23 more useable for a wider variety of vessels and mitigate, to some extent, berthing restrictions at these piers created by dry dock operations at Piers 24 and 25 that utilize Piers 22 and 23 dolphins and bollards as anchor point.
Redevelop Piers 22 and 23 landside by demolishing the old flour mill structures and Warehouses 6 and 8 to construct a multi-level, mixed use maritime center to include administrative space, parking, auto storage, high-cube ground level, and hardened space for pre-staging disaster response equipment.	• Improves function of the harbor. - Creates building space to accommodate maritime uses (administration, back office, storage) that do not require direct waterfront access. - Increases automobile storage capacity at Piers 19 and 20 to make the Piers more functional for auto RO/RO operations. - Facilitates efficient harbor operations by consolidating uses and improving the organization of the harbor. • Aligns with Master Plan goals. - Enhances the harbor's resiliency by providing hardened space for pre-staging emergency equipment.
Strengthen Pier 29 apron and fill in the notch.	• Improves function of the harbor. - Effectively creates a new cargo pier when combined with the recently repaved yard. - Filling the notch expands the length of the workable berth at this pier by approximately 150 LF.
Consolidate maritime operators in shared facility at Piers 27 and 28.	• Improves function of the harbor. - Consolidating similar operations facilitates efficient operations by improving the organization of uses in the harbor. - Consolidating similar operations allows groups of smaller operators to benefit from economies of scale when developing facilities.
Modernize Piers 31 to 33 cargo piers. Remove sheds, cut back pier face and strengthen pier and yard surfaces to accommodate heavy lift equipment to create a open, multi-purpose cargo terminal.	• Improves the function of the harbor. - Effectively widens Kapālama Transit Channel by creating a notch for cargo vessels to tuck into when at berth. - Multi-use cargo terminals provide flexibility in berthing assignments, which enhances the overall operational efficiency of the harbor. - An improved terminal could serve as a secondary resiliency pier. • Aligns with Master Plan goals. - Enhances the harbor's resiliency by hardening the pier so it is better able to withstand storm events and more suitable for handling emergency supplies and equipment.

MASTER PLAN CONCEPTS/IDEAS	
CONCEPT	**RATIONALE FOR INCLUDING IN THE MASTER PLAN**
Extend Pier 36 towards the Federal Project Line to provide additional berthing for fishing vessels.	• Improves function of the harbor. - Additional berthing would reduce congestion for fishing vessels.
Replace Pier 37 when it reaches the end of its useful life. Consider using a floating dock to adapt to SLR.	• Aligns with Master Plan goals. - Ensure resiliency in the face of natural and human-made disasters and climate change by adapting the facility to SLR.
Replace revetment and expand berthing along Pier 38 for shore side vessel services, provisioning and offloading fish at the auction.	• Improves function of the harbor. - Additional berthing adjacent to the fish auction would reduce congested conditions for fishing vessels competing for space to unload catch, refuel and reprovision.
Modernize Piers 39 and 40 (Interisland Cargo Terminal)	• Improves function of the harbor. - Terminal is old and not well-suited for modern cargo operations. Pier and yard improvements will increase the operational capacity and efficiency of the terminal operator and thus interisland cargo movement. • Aligns with Master Plan goals. - Increasing capacity is needed to support future cargo projections.
Reconstruct Pier 60 into a heavy-duty pier and pave the whole area with concrete to make it easier to clean off the aggregate.	• Improves function of the harbor. - Enhances the utility of the pier for a larger variety of cargo and maritime support operations. • Aligns with Master Plan goals. - Protects the environment by preventing co-mingling of aggregates with native soils and allowing better control to prevent discharges of sediments in stormwater runoff.
Undertake signalization and intersection improvements along Nimitz Highway to improve circulation for cargo and maritime vehicle traffic from Piers 19 through 34.	• Improves function of the harbor. - Improves access and egress into harbor lands. - Reduces travel distance for westbound maritime vehicles by eliminating need to execute a U-turn onto westbound Nimitz Highway. - Reduces congestion on Nimitz Highway for the public and for maritime traffic around the harbor.
Modernize Piers 51A and 51B and adjoining yard based on preferred terminal operator needs.	• Improves function of the harbor. - Increases yard capacity and supports greater efficiencies in use of finite harbor land areas. - Supports more efficient terminal operations.

APPENDIX I

MASTER PLAN IMPROVEMENT PRIORITIZATION

MASTER PLAN IMPROVEMENTS

CONCEPT	Source of Concept	HDOT CIP Prioritization Criteria (DSM 05.05.01)								Add'l Criteria	COMMENTS AND NOTES
		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
General Maritime Improvements											
Raise edge of pier or apron using sheet pile / bulkhead construction to form a sea wall at the pier face to adapt to projected SLR. Keep the yards at their current height behind the sea wall to minimize the costs of filling and raising the yards. Install pumps to handle drainage requirements as existing drainage outfalls become inundated.	• DOTH		X					X		X	• Consider this concept as an alternative to elevating entire terminals (i.e., pier, apron, and yard), which could be cost prohibitive.
Develop an emergency entrance (e.g., boat ramp) for pilots, jet skis and other emergency water vehicles. Consider Pier 27E and the Pier 38 maritime support area for a new emergency ramp.	• Stakeholder interview	X						X			
Environmental Protection											
Install infiltration trenches along Nimitz Highway to dispose of construction dewatering effluent.	• DOTH • Stakeholder interview			X				X			
Provide space for development of joint-agency, shared inspection facilities at the major cargo terminals (Sand Island, KCT, Interisland, and Piers 1 and 2).	• Stakeholder interview			X				X			• DOTH is not responsible for development of the facility but can provide space for use by relevant agencies (USDA, USCBP, USFWS, State DOA) at the major cargo terminals, as available. Locations should be located along the periphery of the terminal, outside of the secured areas and near the main entrance.
General Navigational and Operational Improvements											
Widen and deepen the operational draft of the Main Entrance Channel and the Kapālama Transit Channel to accommodate all design vessels. Deepen harbor basins.	• Stakeholder interview • Concept 2040	X						X			• DOTH requested USACE conduct a Feasibility Study to include deepening the operational draft of the harbor, as well as widening the channels.
Dredge and deepen water depths along the pier faces to accommodate the greatest variety of vessels for operational flexibility. Focus on general cargo piers: 1-2, 19-20, 29, 33-34, 39-41, and Sand Island. Minimum depth at all cargo piers = 40 feet.	• Stakeholder interviews							X			• Conduct engineering evaluation of impacts of dredging on existing piles and bulkheads, some may not be deep enough and would be undermined by increasing the draft depth. • Phase dredging with pile/bulkhead reconstruction to prevent undermining pier facilities.
Reopen second harbor entrance.	• Stakeholder interview • Sub-TAC							X	X	X	• DOTH requested USACE conduct a Feasibility Study to include analysis of reopening the second harbor entrance.
Identify flexible use area to temporarily relocate and maintain operations displaced while piers and yards are being repaired/upgraded.	• Project Team							X			• When KCT opens and Pasha moves operations from Piers 1 and 2 and Piers 51A – 52B to KCT, it will create opportunities for temporarily using vacated space for other harbor operations displaced from improvement projects at other piers.
Use long-term leases and public private partnership agreements to incentivize investment in maritime facilities, including pier reconstruction and support buildings	• Stakeholder interview • Project Team					X		X			• PPP arrangements could help expedite harbor facility improvements, improve operational efficiency, and enhance revenues through mutually beneficial agreements with private maritime operators.

MASTER PLAN IMPROVEMENTS

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Signalization and intersection improvements along Nimitz Highway to improve circulation for cargo and maritime vehicle traffic from Piers 19 to 34.	• Concept 2040 • Project Team	X						X	X		• Intersection improvements, including signalization, at various locations on Nimitz Highway will improve harbor function by making container truck movements more efficient. • Intersection improvements could enhance safety by improving and better controlling pedestrian crossings.
Layberth and Anchorage	•										
Add fourth offshore Honolulu Harbor / Mamala Bay Anchorage	• Project Team								X		• Anchorages are under operational jurisdiction of DOTH. The submerged lands are under jurisdiction of the State DLNR. Anchorage locations are designated by USCG authority.
Develop layberth facilities at Tyco Pier by adding more dolphins.	• Concept 2040					X			X		• Additional dolphins will increase berthing length from 600 LF to 1,200 LF.
Piers 1 and 2 General Improvements	•										
Modernize Piers 1 and 2 Cargo Terminal	• Concept 2040 • Sub-TAC • Stakeholder interview				X			X		X	• Designate reconstructed Piers 1A, 1B and 2A as priority resiliency / emergency staging piers with associated improvements to support emergency relief operations. (e.g., heavy-lift pads for mobile cranes and RO/RO ramps). • Install heavy lift pads for mobile cranes and RO/RO ramps. Consider 2,000 PSF-strength concrete for heavy lift pads. • Install reinforced utility conduit able withstand the design storm (Category 5 hurricane) and allow for rapid restoration of power, communications, and water to support the pier's function as a resiliency pier. • Raise pier and yard for 3.2-ft SLR by 2060. Raise pier deck and yard to minimum freeboard height of 6 feet to accommodate full range of barge and RO/RO vessel operations. • Reconstruct and strengthen Piers 1 and 2 using sheet pile / bulkhead design. Sheet pile design should incorporate wave dampening measures to diffuse wave energy from south wells and storm surge. • Consider cutting back Piers 1A and 1B pier face to fast land (approximately 75 LF from existing pier face) and shift the knuckle between Piers 1B and 2A mauka to create more berthing space outside of the Main Entrance Channel navigation corridor. • Repave Piers 1A, 1B and 2A yards, which is paved with asphaltic concrete and is in poor condition. Replace with concrete to accommodate heavy-lift operations.
Negotiate with the Office of Hawaiian Affairs for mutually agreeable use of the 5-acre parcel at Pier 1 / Fort Armstrong (currently used by Re-Use Hawai'i and as a homeless shelter) to expand Pier 1 yard area.	• Concept 2040 • Stakeholder interview							X	X		
Acquire from HCDA the vacant, remnant strip of land adjacent to the Piers 1 and 2 entry gate.	• DOTH							X			

MASTER PLAN IMPROVEMENTS

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Renovate the historic DOH building for maritime administration use.	• Project Team		X			X					
Existing Pier 2 Cruise Terminal Improvements											
Raise 20-ft wide apron at pier edge to accommodate 3.2 ft SLR by 2060.	• Project Team									X	• Maintain minimum design freeboard of 5 feet for cruise vessels and layberth.
Provide shoreside sewer connection to allow cruise vessels to discharge to the municipal collection system to support cruise ships at berth.	• Stakeholder interview							X			
Improve shoreside water connection for cruise vessels to take on water (pressure and flow). Consider upsizing existing lines and providing pumps.	• Stakeholder interview							X			
Provide shoreside power to reduce carbon emissions from idling vessels.	• Stakeholder interview						X	X			
Modernize fendering. Replace bollards with 100-ton bollards (10 bollards).	• Stakeholder interview	X						X			
Modify ground transportation circulation and staging, and develop more parking to improve cruise terminal functionality and reduce impacts to FTZ operations and traffic flow on Ala Moana Blvd.	• Stakeholder interview							X	X		• Modify fencing and pavement markings to create additional vehicle circulation, staging and parking area. • Utilize approximately 0.5 to 1 AC of land area from the Pier 2A yard to increase the staging area at the makai end of the cruise terminal building to expand and improve circulation for containers and service trucks that service cruise vessels berthed at the Pier 2 cruise terminal.
Expand harbor property in front of the Pier 2 cruise terminal to improve ground transportation queuing and circulation by acquiring or gaining use of General Services Agency (GSA) lot.	• Concept 2040 • Stakeholder interview							X	X		• Consider negotiating with the federal government to exchange the Ballpark parking lot at the intersection of Channel Street and Ala Moana Boulevard and/or the historic DOH Building parcel for the GSA lot.
Renovate the Pier 2 Cruise Terminal building to improve capacity and passenger processing for existing operations.	• Stakeholder interview	X						X	X		
Develop pedestrian connectivity and improve pedestrian facilities around Pier 2. Widen sidewalks along Channel Street to better accommodate cruise passengers with luggage walking to/from Ala Moana Blvd.	• Project Team • TAC #1	X						X			
Piers 1 and 2 Consolidated Cruise Terminal											
Terminal Alternative 1 - Renovate the existing Pier 2 Terminal to accommodate simultaneous passenger processing from two cruise vessels berthed at Piers 1 and 2.	• Project Team							X	X		• All passenger processing will occur at the Pier 2 cruise terminal, not ship-side at Pier 1. • Only motor vehicle traffic related to ship provisioning and servicing will occur ship-side at Pier 1.

MASTER PLAN IMPROVEMENTS

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Terminal Alternative 2 – New Pier 2A Terminal - Temporary/Semi-Permanent Structure	• Project Team					X		X	X		• Install a temporary tension fabric structure at Pier 2A to accommodate passenger operations (security and health screening, baggage handling, passenger orientation) for cruise vessels berthed at Pier 1.
Terminal Alternative 3 – New Pier 2A Terminal Facility – Permanent Structure	• Project Team					X		X	X	X	• Construct a new cruise terminal building in the Pier 2A yard makai of the existing Pier 2 Cruise Terminal building to accommodate passenger operations for cruise vessels berthed at Pier 1. • Integrate into the new terminal building hardened, high-cube facilities for pre-staging emergency equipment (e.g., generators and fuel tanks) for disaster events and for storage of large/heavy maritime cargo handling and servicing equipment.
Passenger Access Alternative 1 – Temporary, Mobile Staging	• Project Team							X	X		• Use temporary, mobile equipment (gangway, water barriers, moveable barricades, covered awnings) to direct and secure passenger access between cruise vessels berthed at Pier 1 and the Pier 2 Terminal. • For port call, partial turn or full-turn passenger access to/from a renovated Pier 2 Terminal or new semi-permanent or permanent terminal building at Pier 2A.
Passenger Access Alternative 2 - Create an elevated, retractable walkway	• Project Team	X						X			• Walkway would extend from the existing or new permanent Pier 2A terminal to the knuckle between Piers 1B and 2A. • The walkway would be extended to the gangway of a cruise ship berthed at Pier 1 for passenger access to the terminal. • This alternative is not proposed for Terminal Alternative 2 – temporary tension fabric structure.
Waterfront Development / Public Access											
Increase pedestrian connectivity to Downtown, Chinatown and Kaka'ako. Coordinate with DOT-HWY, HECO and property owners on the mauka side of Ala Moana Boulevard and Nimitz Highway to develop pedestrian facilities (cross walks, signage) and/or transportation services (shuttles, jitneys).	• Project Team • TAC #1	X									• Improve pedestrian crossings at Fort Street/Aloha Tower Drive to Walker Park, at Bishop Street, Richards Street and Channel Street. • Consider using unique pavement textures and colors, signage and other physical motifs to visually emphasize the crossings and unify the area.
Develop street, parking, and pedestrian improvements in the Aloha Tower complex.	• Project Team • Stakeholder Interview	X						X	X		• Provide more bike lanes, pedestrian paths, and landscaping to encourage retail/restaurant/harbor connectivity. • Develop connections to future rail stations.

MASTER PLAN IMPROVEMENTS

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		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Develop Piers 5 and 6 through a public-private-partnership with a private developer: multi-level, mixed-use structure that could potentially contain offices for maritime operators and other businesses, hotel space, passenger orientation facilities, event space, a cultural and/or educational center, retail/commercial and parking.	• Concept 2040 • Project Team • Stakeholder Interview • Sub-TAC					X				X	• Raise ground elevation to accommodate 3.2 ft SLR by 2060. • Develop infrastructure upgrades to sewer, water, power/communication and drainage as necessary to support new development at Piers 5 and 6.
Piers 5 to 11 Maritime Improvements											
Replace Pier 5 and 6 revetments and dolphins with modern piers using sheet-pile/bulkhead construction to improve berthing for day excursion vessels, ferry service and layberth.	• Concept 2040 • Stakeholder Interview				X	X		X		X	• Keep makai edge of Piers 5 and 6 as natural shoreline with pedestrian access to serve as a public open space / point of interest. • Integrate Piers 5 and 6 vessel operations with development of a maritime center at Piers 5 and 6. • Consider installing floating docks.
Upgrade sewer line at Pier 7 to support day excursion and ferry vessels.	• Project Team							X			
Upgrade infrastructure at Pier 8 (waterline, wastewater pump out, improved lighting) to support day excursion operations.	• Stakeholder interview	X						X			
At Piers 8 through 11, construct a minimum 16-ft wide apron at edge of pier using sheet pile / bulkhead construction to form a sea wall at the pier face to adapt to projected 3.2 ft SLR by 2060.	• Project Team		X							X	• Maintain minimum design freeboard of 5 feet for day excursion vessels and lay berth. Keep the landside areas at their current height behind the sea wall to minimize the costs of redevelopment. Install motor vehicle access ramps onto the raised apron.
Piers 10 and 11 Landside Redevelopment											
Alternative 1 - Modernize Piers 10 and 11 Cruise Terminal for cruise operations only.	• Stakeholder interview		X					X	X		• Redevelop the terminal into a modern facility with improved circulation for pedestrians, passenger ground transportation and service vehicles.
Alternative 2 - Redevelop piers 10 and 11 as a shared-use facility, combining Cruise Terminal operations and retail/commercial uses.	• Concept 2040		X			X		X	X		• Improve circulation for pedestrians, passenger ground transportation and service vehicles.
Alternative 3 - Redevelop Piers 10 and 11 for retail, commercial and office use only.	• DOTH • Stakeholder Interview		X			X					
In combination with any of the three alternatives above, upgrade infrastructure (sewer, water, power/ communication and drainage) as necessary to support redevelopment of Piers 10 and 11 sheds.	• DOTH • Stakeholder Interview							X			

MASTER PLAN IMPROVEMENTS

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		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Piers 12 to 15											
Reconstruct Pier 12 Diamond Head side pier and yard for a maritime operator or provide a long-term lease for an operator to invest in pier improvements.	• Concept 2040					X		X			• Existing historic coral blocks should be preserved in place.
Replace segmented pier on 'ewa side of Pier 12 with a continuous pier to accommodate a greater array of vessel types.	• Project Team • Stakeholder Interview				X			X	X		• The segmented pier and dolphins were constructed in 2016. Reconstruction should only be undertaken when they reach the end of their useful life or if a private entity undertakes redevelopment at their own cost.
Extend proposed continuous pier length approximately 100 LF from end of existing pier.	• Project Team • Stakeholder Interview							X			• Extending the pier in this location avoids direct disturbance of the historic coral blocks. However, submerged areas off of Pier 12 contain corals that could be affected by construction of new pier piles and indirectly affected by increased shading from the pier structure.
Renovate/redevelop the Piers 13 and 14 pier and building facilities through a public-private partnership with a maritime operator.	• Project Team • Stakeholder interview • Sub-TAC				X	X		X			• Piers 13 and 14 were constructed in 1930 and determined to have high preservation value. Endeavor to the preserve the historic attributes and character of the building when renovation or redevelopment work is undertaken. • If the needs of the harbor dictate and the opportunity arises, redevelopment of the pier and shed structure could be conducted by a private maritime operator under a long-term lease in order to enhance the function of the pier for the intended maritime support services use and to support overall harbor operations.
Piers 13 and 14 - Reconstruct pier using sheet pile / bulkhead construction. Include a 2-ft wide raised edge to form a seawater barrier at the pier face.	• Project Team									X	• Construct the raised edge to adapt to projected 3.2 ft SLR and maintain minimum design freeboard of 3 feet for work boats.
At Pier 15, routinely monitor increases in SLR and reassess projections over time. Based on current projections and State SLR guidelines, raise the pier deck heights as necessary to account for SLR of 3.2 FT by 2060.	• Project Team									X	• Maintain a minimum operational freeboard of 3 FT for MSRC Vessel and barge and layberth. • The segmented pier was recently completed in 2016 and therefore its redevelopment is low priority and should only be considered as it approaches the end of its useful life. Depending on the piers' structural condition, alternatives may entail: - Reconstruct entire pier using either pile-supported deck or bulkhead sheet pile construction. - Raise the pier deck using the existing piles with the addition of structural spacers. - Install mooring dolphins with a floating dock system.
Piers 16 to 18 Improvements											
Develop respite center with office and storage space for commercial fishermen.	• Concept 2040 • Stakeholder interview							X			
Widen Pier 16 to accommodate motor vehicles to facilitate ship provisioning and fueling.	• PAC #2							X			• Undertake when the pier reaches the end of its useful life and needs major repair or reconstruction.

MASTER PLAN IMPROVEMENTS

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Elevate Piers 16 and 17 as necessary to account for SLR of 3.2 feet by 2060.	• Project Team									X	• Maintain a minimum operational draft of 3 feet for fishing vessel operations. • Depending on the piers' structural condition, alternatives may entail: - Raise pier deck using existing piles and structural spacers. - Reconstruct the entire pier with either pile-supported deck or bulkhead sheet pile construction.
Upgrade electrical service to Piers 17 and 18.	• Stakeholder interview						X	X			• Provide shore-to-ship power for fishing vessels.
Elevate Pier 18 pier deck height as necessary to account for SLR of 3.2 feet by 2060.	• PAC #2									X	•
Piers 19 and 20 General Cargo Pier											
Modernize Piers 19 and 20 cargo terminal.	• Concept 2040 • Stakeholder interview • Sub-TAC				X			X		X	• Raise the pier deck and yard height as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum operational freeboard of 6 feet for cargo and RO/RO vessel operations. • Reconstruct pier, apron and yard using sheet pile / bulkhead construction. • Improve fendering and bollards.
<u>Pier 19 Near Term:</u> Relocate DOTH Oahu District Base Yard from Sand Island to a new interim location at Pier 19.	• DOTH		X					X		X	• Renovate the Pier 19 shed and Super Ferry building to create office, maintenance shop and storage space. • Use adjacent areas for fleet vehicle parking and equipment storage. Pave fleet vehicle parking areas as necessary. • Maintain the existing security fence separation within the PIer 19 shed to separate cargo operations from base yard use. • Maintain the Hawaii Pilots' existing access, facility space and berthing. • Maintain the existing driveway access to the Piers 19 and 20 cargo. • When a permanent location becomes available and/or cargo demand increases and Pier 19 is required to meet that demand, relocate the base yard operations from Pier 19 to a new location and remove the buildings and improve Pier 19 as an open, general use cargo pier.
<u>Pier 19 Long Term (2050):</u> Demolish the existing Pier 19 warehouse and Super Ferry building to create open yard for general cargo and resiliency pier use.	• DOTH • Sub-TAC							X	X	X	• Phase demolition as existing buildings lose their utility to support maritime needs.
Modernize Piers 21 and 22 Tug Row	•										

MASTER PLAN IMPROVEMENTS

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Reconstruct Piers 21 and 22.	• Concept 2040 • Stakeholder interview				X			X		X	• Raise the pier deck height as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum operational draft of 3 feet for tug operations. • Reconstruct pier, apron and yard using sheet pile / bulkhead construction. • Strengthen apron to accommodate truck-mounted cranes and cable spools. Replace asphalt pavement with concrete. • Improve fendering and bollards.
Develop Piers 21 and 22 as dedicated tugboat row.	• Concept 2040 • Stakeholder interview • Sub-TAC	X	X		X			X			• Phase improvements so as not to disrupt tug operations. • Demolish existing buildings at Piers 21 and 22. • Develop new shared-use facilities and consolidate tug operators. Facilities should include new office, warehouse and maintenance building(s), and parking. • Consider opportunities to use long-term leases to encourage private investment by the existing operators.
Provide shoreside power and upgrade shoreside water utilities to support berthed tugboats.	• Stakeholder interview						X	X			
Piers 22/23 Modernization											
Reconstruct Piers 22-23.	• Project Team • Concept 2040				X	X		X		X	• Raise the pier deck height as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum operational freeboard of 3 feet for work boat and tug operations. • Reconstruct pier using sheet pile / bulkhead construction. • Cut back Piers 22 and 23 pier face by 20 to 40 feet to widen slipway. • Improve fendering and bollards. • Clear out subsurface coral and rocks.
Dredge full extent of Piers 22 to 26 slipway to 35-foot depth.	• Stakeholder interview • Sub-TAC		X					X			• There is no established design draft for the slipway. Existing depths range from 10 to 37 feet based on 2016 hydrosurvey.
Piers 19 to 23 Maritime Center											
Demolish Warehouses 6 & 8, flour mill structures and miscellaneous sheds at Pier23.	• Concept 2040 • Stakeholder interview							X			• Redevelopment may require remediation of contaminated soil, groundwater, lead, and asbestos.

MASTER PLAN IMPROVEMENTS

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Develop multi-level, mixed-use reinforced concrete structure to accommodate office space, parking, auto storage, and high-cube ground level to accommodate cargo operations.	• Concept 2040 • Stakeholder interview					X		X	X	X	• Incorporate existing McCabe building, if feasible. • Examples of the type of structure being contemplated for the Maritime Center include Walmart on Ke'eaumoku St. and the Airport industrial Center. • Integrate the parking structure with Piers 19/20 cargo operations. • Provide storage area for large/heavy maritime cargo handling and servicing equipment, and staging for emergency equipment. • Develop new commercial / retail buildings on Nimitz Highway frontage as part of the maritime center structure or as stand-alone structures.
Access and circulation improvements.	• Concept 2040 • Project Team							X			• Develop the Kukahi Street intersection on Nimitz Highway as the primary access to the new Piers 19 to 23 Maritime Center and Piers 19 and 20 cargo terminal. Signalize the intersection. Coordinate with DOT-HWY for a signalization warrant study. • Reauthorize the driveway entrance at Pier 23 to provide right-turn-in only access to Piers 21 and 22, "Tug Row," and secondary access to the proposed Maritime Center at Piers 22 to 23. • Create new driveway connection between Piers 31 to 34 and the signalized intersection at Alakawa Street.
Piers 24 to 28 Maritime Improvements											
Provide dedicated pier locations to consolidate maritime support operations	• Concept 2040 • Stakeholders							X			
Reconstruct pier to include a 16-ft wide raised apron at pier edge to accommodate 3.2 ft SLR by 2060.	• Project Team				X			X		X	• Maintain minimum design freeboard of 3 feet at Piers 24 to 29A for work boats, tugs, drydocks and lay berth. Install motor vehicle access ramps to the raised apron.
Pier 29 Modernization											

MASTER PLAN IMPROVEMENTS

CONCEPT	Source of Concept	HDOT CIP Prioritization Criteria (DSM 05.05.01)								Add'l Criteria	COMMENTS AND NOTES
		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Reconstruct Pier 29 pier and apron, including the unimproved "notch" in the pier. Construct a 100-ft wide raised apron to accommodate 3.2 ft SLR by 2060.	• Concept 2040 • Stakeholder interview				X			X	X	X	• Designate Pier 29 as a secondary resiliency pier, with primary use a flexible, multi-use, general cargo pier and lay berth. • Reconstruct and strengthen pier face and apron to approximately 50-feet from pier face (up to recently reconstructed yard). Construct apron to accommodate heavy lift equipment. • Maintain minimum design freeboard of 6 feet for cargo and RO/RO vessels. Install motor vehicle access ramps to the raised apron. • Fill 150-LF "notch" in apron as part of pier reconstruction to additional, workable berth.
Improve truck access to and from the cargo pier.	• Concept 2040							X			• Re-authorize and reconstruct the east-bound highway exit lane with connection to the Pacific St. intersection and access to Piers 27 to 29. At the Pacific St. exit, container trucks leaving Pier 29 are permitted right-out only to avoid blocking the Pacific St. intersection. Note: This project is currently in progress.
Piers 31 to 34 Modernization											
Reconstruct pier, apron and yard.	• Concept 2040 • DOTH	X			X			X		X	• Cut back pier face to remove pile-supported deck construction and replace with bulkhead/sheet pile with fill construction. Cut back at a minimum to existing fast land (approximately 30 feet) to create a notch for vessel berthing to reduce intrusion into the Kapālama Transit Channel as an aid to navigation. The dimensions of the cut back area will be determined during design. • Improve fendering and bollards. • Strengthen pier and yard surfaces to accommodate heavy lift equipment. • Elevate to account for SLR of 3.2 feet by 2060. Alternatives include: - Raise the pier, yard and interior land areas as necessary. - Raise 100-ft wide apron at edge of to form a sea wall at the pier face. Keep the landside areas at their current height behind the sea wall to minimize the costs of redevelopment filling and raising the yards. Install motor vehicle access ramps to the raised apron
Improve vehicle access and circulation.	• Stakeholder interview							X			• Create a new internal access driveway with connection to the signalized intersection at Alakawa St. and Nimitz Hwy. This will allow for full, signalized turning movements onto Nimitz Highway.This alternative requires acquisition of the Honolulu Freight Services parcel by the DOTH.
Acquire DOT-Airports Division parcel (Honolulu Freight Services) mauka of Pier 33 to expand the Pier 33 yard area.	• DOTH					X		X			• The State is in the process of conveying jurisdiction of the parcel from DOT-Airports to DOTH.

MASTER PLAN IMPROVEMENTS

CONCEPT	Source of Concept	HDOT CIP Prioritization Criteria (DSM 05.05.01)								Add'l Criteria	COMMENTS AND NOTES
		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Piers 36 to 38 Fishing Village Maritime Improvements											
Extend Pier 36 by approximately 160 LF to the Federal Project Line to provide additional berthing for fishing vessels.	• Concept 2040 • Sub-TAC							X	X	X	• Construct the deck height of the extended pier segment as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum design freeboard of 3 feet for fishing vessel operations.
Elevate Pier 36 pier deck height to address SLR.	• Project Team							X		X	• Raise pier deck height as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum design freeboard of 3 feet for fishing vessel operations. • Alternatives depend on the structural condition at the time of reconstruction and may include: - Reconstruct the entire pile and deck pier structure. - Raise and widen the pier deck using the existing piles with the addition of structural spacers.
Replace Pier 37 when it reaches the end of its designed life with a floating pier.	• Project Team				X					X	• Replace the existing pile-and-deck pier with a floating dock design to accommodate 3.2 ft SLR by 2060.
Replace existing revetment and extend Pier 38 bulkhead pier improvements	• Concept 2040 • Stakeholder interview • Sub-TAC				X			X	X		• Create approximately 645 LF of new bulkhead pier for shore side vessel services, provisioning off-loading fish for the auction, and for lay berth use. • Consider floating dock design for fishing vessels and work boat piers adjacent to the Maritime Support Area.
Construct 16-ft wide raised apron at edge of Pier 38 to form a sea wall at the pier face to adapt to projected 3.2 ft SLR by 2060.	• Stakeholder interview • Sub-TAC • Project Team		X					X		X	• Maintain minimum design freeboard of 3 feet for fishing vessels and lay berth. Keep the landside areas at their current height behind the sea wall to minimize the costs of redevelopment filling and raising the yards. Install motor vehicle access ramps onto the raised apron.
Piers 38 Maritime Improvements											
Clear and pave the 1.4-acre lot adjacent to the Kapālama Canal outlet for Maritime Support uses and possible future facility development through a public/private partnership.	• Project Team					X					• Makes us of underutilized area.

MASTER PLAN IMPROVEMENTS

CONCEPT	Source of Concept	HDOT CIP Prioritization Criteria (DSM 05.05.01)								Add'l Criteria	COMMENTS AND NOTES
		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Develop approximately 360 LF of new pier adjacent to maritime support area for work boats and lay berth.	• Project Team					X		X			• Consider floating dock design for work boat piers adjacent to the Maritime Support Area.
Reconstruct existing fuel barge pier for miscellaneous vessel use.	• Project Team				X			X			• This alternative could be undertaken as an individual improvement if Pier 38 dock improvements are not implemented. If the Pier 38 improvements are implemented, reconstructing the fuel barge pier is not recommended.
Piers 39 to 41 Interisland Terminal Modernization											
Reconstruct Piers 39 and 40 pier and yard.	• Concept 2040 • Stakeholder interview		X		X			X	X	X	• Reconstruct, raise and strengthen Piers 39 to 41 to the full extent of the pier using sheet pile bulkhead construction to accommodate modern barge operations and account for 3.2 feet SLR by 2060. • Improve fendering and bollards. • Raise and improve backland yard height as necessary to account for SLR of 3.2 feet by 2060. Maintain design freeboard of 6 feet for tug and barge operations. Alternatives include: - Raise the entire yard to match the pier height - Raise the portion of the yard adjacent to the piers to match the pier height and leave the mauka areas of the terminal at existing grade. • Replace pavement with concrete to accommodate heavy-lift operations. • Provide power for refrigerated containers. • Provide lighting.
Fill in approximately 0.75-acres of the Piers 39 and 40 slipway to expand the yard area.	• Project Team • Stakeholder interview							X	X		• Retain sufficient berthing within the slipway to accommodate two barges on each side.
Reconstruct, raise and strengthen the revetment at the Kapālama Canal outlet near Pier 39-1A.	• Project Team				X			X		X	• Revetment improvements support SLR, resiliency and terminal modernization objectives.
Relocate buildings located at the center of the Interisland Terminal yard to the perimeter of the yard or off-site location.	• Concept 2040 • Stakeholder interview							X	X		• When the buildings come to the end of their useful life, demolish and reconstruct to the perimeter of the yard or off-site location to increase yard capacity and improve operations.
Create new Libby Street Driveway entrance.	• Concept 2040							X			• Reduce congestion at truck gate by creating a new access to non-secure areas of the terminal for staff and customer traffic.
Internalize truck queuing to eliminate traffic impacts on public streets. Provide internal truck queuing along Auiki Street.	• Stakeholder interview							X	X		• Consider one-way in and one-way out vehicle circulation through the terminal to reduce congestion and queuing
Piers 51-53 Sand Island Terminal Modernization											

MASTER PLAN IMPROVEMENTS

CONCEPT	Source of Concept	HDOT CIP Prioritization Criteria (DSM 05.05.01)								Add'l Criteria	COMMENTS AND NOTES
		Public Safety	Existing Systems Preservation	State and Federal Compliance	Major Replacements	Revenue Enhancements	Energy Efficiency	Functional Improvement / System Modernization	Capacity Expansion / Congestion Mitigation	Sea Level Rise / Resiliency	
Reconstruct Piers 51A to 53C.	• Project Team				X			X		X	• Raise the height of the pier, apron and 120-ft wide gantry track corridor as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum design freeboard of 6 feet for cargo vessel operations. • Reconstruct pier using sheet-pile/bulkhead construction. • Strengthen yard pavement. Use concrete in all areas to be used for grounded container storage and heavy lift (top pick) operations.
Install hydro-dynamic separators as necessary.	• DOTH			X				X			• Need 2 or 3 hydro-dynamic separator units at Sand Island Terminal to treat stormwater drainage from the yard.
Improve truck gates.	• Project Team • Stakeholder interview							X			• Internalize truck storage to eliminate queuing on Sand Island Parkway.
Move buildings and structures to the perimeter of the yard or off-site location.	• Project Team • Stakeholder interview							X	X		• As buildings and structures located at the center of the terminal yard reach the end of their useful life, relocate them to the perimeter of the yard or off-site location to increase yard capacity and improve operations.
Pier 60 Modernization											
Reconstruct Pier 60 yard into a heavy-duty pier for barge (Ro/Ro) operations:	• Concept 2040				X			X		X	• Raise the height of the pier, apron and yard as necessary to account for SLR of 3.2 feet by 2060 while maintaining a minimum design freeboard of 6 feet for tug and barge operations. • Pave entire yard (HC&D lease areas) with concrete to prevent comingling of bulk aggregate material with natural soil and to contain industrial discharges.
Develop backland areas with paved surface for auto or container/chassis storage or other maritime uses.	• Concept 2040		X			X		X			• Raise the height of the backland areas as necessary to account for SLR of 3.2 feet by 2060.
Create new, direct industrial street access to the pier and backland areas.	• Concept 2040					X		X			• Create new business frontage on Pier 60 back lands, with street connection to Pahounui Street. • Acquire right-of-way to improve street layout and circulation.

APPENDIX J

ARCHAEOLOGICAL LITERATURE REVIEW – STATE INVENTORY OF HISTORIC PROPERTIES AND LAND COMMISION AWARDS LOCATION MAP (CULTURAL SURVEYS HAWAIʻI, 2021)

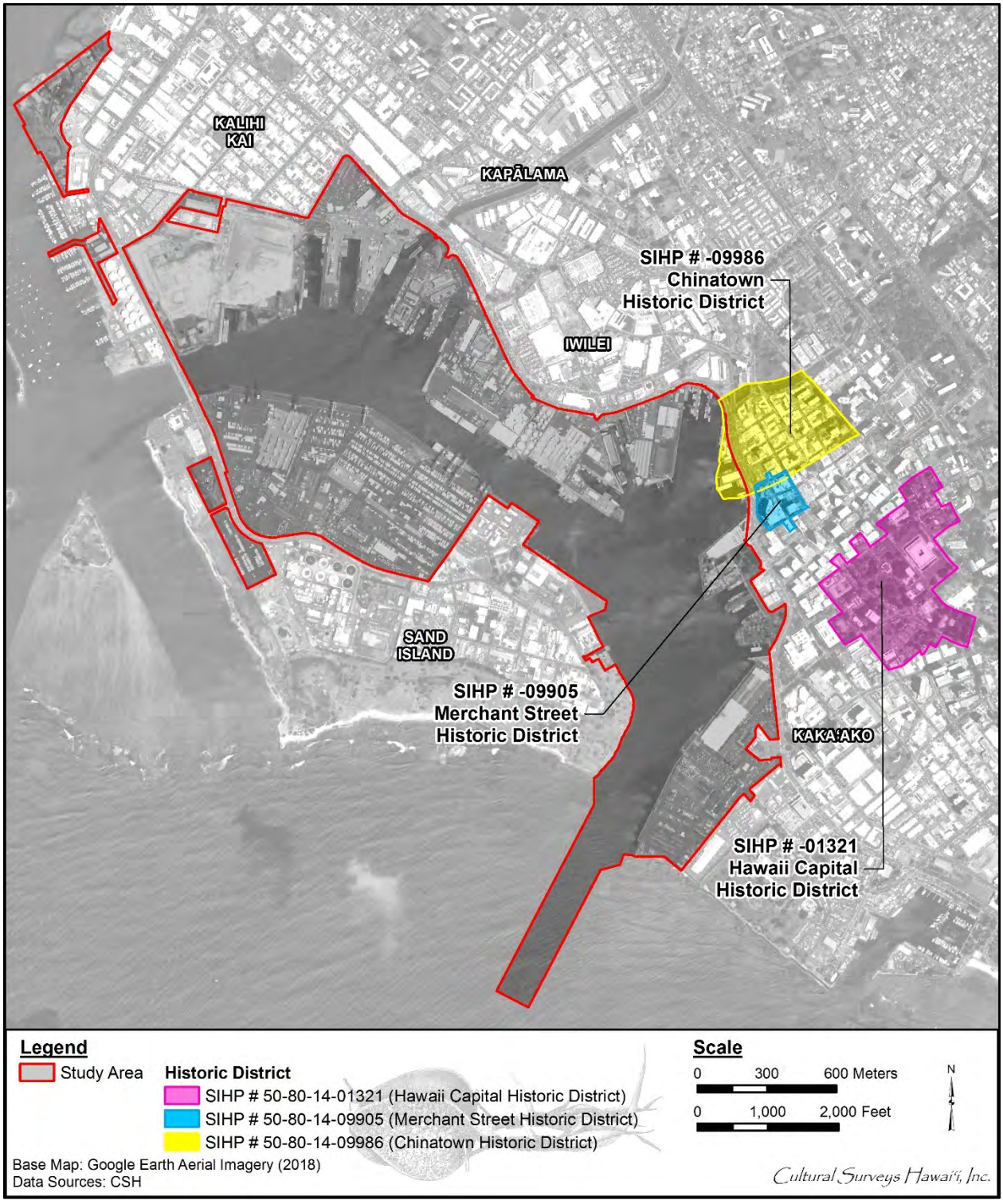


Figure 120. Aerial photograph showing esignated historic districts near Honolulu Harbor, with the study area (Google Earth 2018)

Table 6. Previous archaeological studies in the vicinity of the study area (studies within the current study area are in bold)

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
McAllister 1933	Archaeological reconnaissance survey	Island-wide	Recorded five fishponds in Kalihi Kai lumped under two site numbers: Ananoho and Auiki fishponds (SIHP # -0073) and Pāhouiki, Pāhounui, and Apili fishponds (SIHP # -0074)
Ota and Kam 1982	Burial report	Corner of Punchbowl and Halekauwila	Documented six partial human burials (SIHP # -2963), with tooth evulsions interpreted as probable pre-Contact to 1850 date
Yent 1985	Burial report	Honolulu Ironworks construction site (Punchbowl and Pohukaina)	Ka‘ākaukukui Cemetery (SIHP # -2918) at Honolulu Ironworks project; six burials mentioned, provides documentation for Burials 5 and 6
Athens 1986	Archaeological monitoring	Pohukaina and South St	Identified one historic property (SIHP # -1973), historic deposits with artifacts dating from late nineteenth to early 20th century
Hammatt 1986	Archaeological reconnaissance survey	Sand Island, TMK: [1] 1-2-024:037	No historic properties identified; observed land entirely composed of dredged coral fill from expansion and improvement of Honolulu Harbor beginning in 1920s and altered since WWII for industrial and military purposes
Leidemann 1988	Analysis of artifactual material	Judiciary Garage site	Analysis of artifacts (ceramics and bottles dating between 1880 and 1930) from a subsurface cultural deposit (SIHP # -1973)
Wong Smith and Rosendahl 1990	Archaeological reconnaissance survey	Honolulu Harbor, Pier 5–Pier 14	Documented *Falls of Clyde* (SIHP # -9700) docked at Pier 7, Irwin Memorial Park (SIHP # -9829), Aloha Tower (SIHP # -9929), and Piers 8–12 (no SIHP # assigned)
Chiogioji and Hammatt 1992	Archaeological assessment (no finds AIS)	10,000 sq ft parcel in Iwilei	Research indicated parcel originally consisted of portion of Kawa Fishpond and marsh lands which were filled between 1880s and 1890s for operation of OR&L Co.

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Hurst and Allen 1992	Archaeological monitoring	Harbor Court property bounded by Queen St, Bethel St, Merchant St, and Fort St Mall	One historic property documented: SIHP # -2456, a subsurface cultural layer containing both pre- and post-Contact elements; layer contained primarily post-Contact features (i.e., building foundation remnants); however, both pre- and post-Contact artifacts also observed; traditional Hawaiian artifacts included basalt and volcanic glass flakes and modified marine shell; historic artifacts included nineteenth century bottles and ceramics
Landrum and Dixon 1992	Archaeological data recovery	River St and Nimitz Hwy, Site 50-Oa-A5-16	Included identification of seven features: two partially disturbed pre-Contact traditional Hawaiian features (including soft tissue and skeletal remains of one individual) and five disturbed, post-Contact features; no SIHP #s specified
Denham and Kennedy 1993	Archaeological monitoring	Hawai‘i State Capitol Complex and Dept of Agriculture Bldg	Two historic properties documented: SIHP # -4605, a multi-component complex consisting of a human burial, historic trash pit, firepit, and six postholes, and SIHP # -4606 consisting of nine historic trash pits
Dunn and Rosendahl 1993	Archaeological inventory survey	Nu‘uanu Court project	Documented one historic property: SIHP # -2456, a cultural layer containing both pre- and post-Contact features
Pfeffer et al. 1993	Archaeological monitoring	Queen St, South St, Punchbowl St, and Halekauwila St	Documented 147 burials, including two cemeteries (SIHP # -3712 at South St and Quinn St and SIHP # -4534 at Queen St) and two isolated burials
Erkelens et al. 1994	Burial report	Kekaulike project	Documented one historic property: SIHP #-4875, four sets of human skeletal remains identified during inventory survey and data recovery investigations
Kennedy et al. 1994	Archaeological inventory survey	Kekaulike Revitalization project	Identified SIHP # -4857, a small fishpond, and SIHP #-4588, a multi-component complex consisting of 53 features dating from 20th century to pre-Contact, including three human burials

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Chiogioji and Hammatt 1995	Archaeological assessment	Iwilei, Sand Island, TMKs: [1] 1-5-020, 034, 041, 042 (corridor stretching from Iwilei coastline through Kapālama Channel to middle of Sand Island)	Background research suggested what had once been open water and tidal reefs became reclaimed land consisting of dredged fill, and concluded no historic properties likely to be encountered in the area
Goodwin et al. 1995	Archaeological data recovery (burial report)	Marin Tower property	Entire Marin Tower property designated SIHP # -4494; report details 15 human burials and scattered, isolated human skeletal elements associated with SIHP # -4494
Riley et al. 1995	Data recovery	Kekaulike Revitalization project, ‘Ewa Block	Further documented SIHP # -4587 and -4588 (initially identified by Kennedy et al. 1994); documented 55 features spanning early pre-Contact period through twentieth century; radiocarbon dating of SIHP # -4587 (small fishpond) yielded early 10th century date, and dating of coral reef stone platform (component of SIHP # -4588) yielded an 11th century date
Goodwin et al. 1996	Archaeological inventory survey, data recovery, and monitoring	Marin Tower	Entire Marin Tower property designated SIHP # -4494, which encompasses 28 post-Contact burial features and several sets of displaced human skeletal remains, pre-Contact fire pits, as well as early post-Contact structural foundations associated with residence of Marin family from about 1810 to 1850
Goodwin 1997	Archaeological inventory survey	Kekaulike project, Diamond Head Block	Identified one historic property: SIHP # -4875, a multi-component complex consisting of 105 features and six culturally enriched deposits, including one human burial; features range in age from traditional Hawaiian features dating to early post-Contact period to later historic and modern features and structural remnants

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Lebo 1997	Archaeological data recovery	Harbor Court property bounded by Queen St, Bethel St, Merchant St, and Fort St Mall	Documented 113 features within pre-Contact deposits (SIHP # -2456) including 86 post molds, 25 in-filled pits, and two firepits; traditional Hawaiian artifacts collected from pre-Contact deposits consisted of primarily basalt tools and flakes; radiocarbon analysis of SIHP # -2456 deposits indicated initial occupation between AD 1000 and AD 1200
Moore 1997; Moore and Kennedy 1999	Burial mitigation	Pier 40, TMK: [1] 1-5-032:005	Identified one in situ (likely pre-WWI) human burial, SIHP # -5581, encountered during construction activities in 1997; remains reinterred in 1999, location uncertain
Lebo and McGuirt 2000a, b	Archaeological inventory survey and data recovery	Nimitz Hwy Water System Improvements in Downtown Honolulu	Identified one historic property: SIHP # -5496, subsurface cultural layer containing both pre- and post-Contact archaeological features
McIntosh and Cleghorn 2000	Literature review and field inspection	Piers 2, 12–16, 18–22, 24–29, 32, and Lagoon Dr (adjacent to Honolulu International Airport)	Surveyed large portion of coastal area belonging to Historic Downtown and Chinatown District (SIHP # -9986); no additional surface historic properties identified; report concluded no significant cultural or archaeological deposits likely present
Elmore and Kennedy 2001	Archaeological monitoring	King St between River St and Bethel St	Identified one in situ flexed human burial, SIHP #-5781
McDermott and Mann 2001	Archaeological inventory survey	Nimitz Hwy Water System Improvements	Additional investigations of Kawa Fishpond (SIHP # -5966); samples did not provide clear dates for construction of fishpond, but it appears fishpond deposits accumulating since at least AD 1150-1350
Winieski and Hammatt 2001	Archaeological monitoring	Nimitz Hwy reconstructed sewer, TMKs: [1] 1-7-002, 003 and 2-1-002, 013–016, 025, 027, and 029–032	Identified one historic property, SIHP # -5942: historic brick alignment at intersection of Queen St, and historic brick-lined manhole and remnant of light gauge trolley rail observed at intersection of Queen St and Nimitz Hwy

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Athens and Ward 2002	Paleo-environmental analysis	Auiki and Ananoho fishponds, Kalihi Kai	Obtained four sediment cores from fishponds (SIHP # -0073); analysis suggested deposits had been disturbed (through reclamation projects in and around Honolulu Harbor); further analysis not possible
Lebo 2002	Data recovery	Harbor Court property bounded by Queen St, Bethel St, Merchant St, and Fort St Mall	Documented 35 new features of SIHP # -2456: post-Contact deposits included fire pits, paved surfaces, building foundations, post molds, and trash pits; documented artifacts included bottles, ceramics, glass beads, buttons (wood, shell, and bone), adzes (stone and shell), flakes (basalt, quartz, chert, flint, jasper, and volcanic glass), fishhook blanks, bone awls, hammer stones, and grinding stones
Mann and Hammatt 2002	Archaeological monitoring	King St Rehabilitation project	Identified one incomplete, previously disturbed human burial (SIHP # -6317) near intersection of S. King St and Punchbowl St, and a pit feature containing non-human skeletal remains at corner of S. King St and Richards St
West et al. 2002	Archaeological monitoring	King St, between Liliha St and River St	Documented previously recorded Honolulu Rapid Transit & Land Company Trolley (HRT&L), SIHP # -5942, along with numerous associated artifacts
Moore et al. 2004	Archaeological inventory survey	Sand Island Access Rd, eastern coastline Keʻehi Lagoon, TMK: [1] 1-2-021:013	Six cores excavated through old fill and into area of former fishponds, Apili, Pāhouiki and Pāhounui (SIHP # -0074); borings did not give definitive evidence of fishpond deposits
Cordy and Hammatt 2005	Archaeological monitoring	Punchbowl St Improvements, Phase 2 Downtown Honolulu	No historic properties identified

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Goodwin and Allen 2005	Archaeological data recovery	Kekaulike project Diamond Head Block	Further documentation of SIHP # -4875: excavated four house compounds and a blacksmith's shop, documented four human burials; radiocarbon dating indicated use of area as early as 13th century, with majority of documented features associated with early pre-Contact period
Athens and Ward 2007	Paleo-environmental analysis	Former Ananoho Fishpond	Documented two cores but concluded "all vestiges of the former Ananoho Fishpond (SIHP # -0073) have disappeared or been destroyed"
Dagher and Spear 2007	Archaeological monitoring	Pacific Town Gateway Center Project, N. King St	Identified two historic properties: SIHP # -6889, two human burials, likely Native Hawaiian; and SIHP # -6926, a mortared basalt foundation wall and ceramic storm drain containing cache of ceramic vases
Hammatt and Shideler 2007	Archaeological assessment	Small Boat Harbor, Kalihi Kai, TMK: [1] 1-2-025:024	No historic properties identified
Hazlett et al. 2008	Archaeological monitoring	Aloha Tower Dr	No historic properties identified
Hazlett and Hammatt 2008	Archaeological monitoring	Intersections of Alakea and Queen streets and Alakea and Merchant streets	No historic properties identified
Hunkin and Hammatt 2008	Archaeological monitoring	Armstrong Bldg courtyard renovation project	No historic properties identified
McElroy 2008	Archaeological inventory survey	TMKs: [1] 2-10-59:011 and 012	No historic properties identified
Petrey et al. 2009	Archaeological monitoring	Nimitz Hwy and Ala Moana Blvd	No historic properties identified

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Hammatt et al. 2010	Archaeological literature review and field inspection	Immigration and Customs Enforcement (ICE) Master Plan, TMKs: [1] 2-1-015:018 and 020	No historic properties identified; concluded study area is 20th century fill atop tidal flats (except for late 19th century seawall potentially abutting northeast edge of project lands)
Pammer and Hammatt 2010	Archaeological assessment	Former Comp USA parcel; TMKs: [1] 2-1-055:004, 009, 017	No historic properties identified
Fechner et al. 2012	Archaeological inventory survey	Kaka‘ako and downtown Honolulu, various TMKs	No historic properties identified
Hunkin et al. 2012	Archaeological monitoring	Kalihi/Nu‘uanu Sewer Rehabilitation project	One isolated human bone fragment discovered in fill material (no SIHP # designated)
Hammatt 2013	Archaeological inventory survey	City Center (Section 4) of the Honolulu High-Capacity Transit Corridor project	Identified three archaeological historic properties near present study area: SIHP # -2918, a subsurface cultural deposit and human burials (away from present study area) SIHP # -7189, a subsurface burnt trash deposit (away from present study area) SIHP # -7190, subsurface salt pan remnants (west of Pier 2)
O’Hare et al. 2013	Archaeological literature review and field inspection	Honolulu Harbor, Piers 12 and 15, TMKs: [1] 2-1-001:043–045, 055, 056	Designated Piers 12 and 15 as historic properties (SIHP #s -7575 and -7576, respectively)

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Tulchin and Hammatt 2013	Archaeological inventory survey	Kamehameha Schools Kaka‘ako Block F	Documented two historic properties: SIHP # -7412, a discontinuous subsurface cultural layer containing post-Contact western-introduced cultural material, and SIHP # -7413, surface and subsurface features predominantly associated with development and utilization as Hawaiian Sugar Planters Immigration Station (structural remnants and subsurface trash layers)
Hammatt and Shideler 2014	Archaeological assessment	SOEST Facility at Sand Island and Floating Dock at Marine Education Training Center (METC)	No historic properties identified
Tulchin et al. 2014	Archaeological inventory survey	Kamehameha Schools Kaka‘ako Block B, TMKs: [1] 2-1-054:025, 027, 028 (por.), and 032	Two archaeological historic properties identified: post-Contact structural remnants associated with early to mid-20th century development (SIHP # -7512), and post-Contact trash layer associated with early 20th century land reclamation (SIHP # -7513)
Enanoria and Hammatt 2015	Archaeological monitoring	King St between Bethel St and River St, TMKs: [1] 1-7-002, 1-7-003 and 2-1-002	No historic properties identified; presence of naturally deposited sediments suggests potential for encountering cultural deposits within area or near vicinity
Vernon et al. 2015	Archaeological monitoring	Intersection of Auiki St and Mokauea St	No historic properties identified; documented 52 isolated historic artifacts, deposited along with imported fill during early 20th century
Enanoria and Hammatt 2016	Archaeological inventory survey	Kaka‘ako Pumping Station, 653 Ala Moana Blvd	Ala Moana (Kaka‘ako) Pumping Station (SIHP # -9710) listed on Hawai‘i Register of Historic Places (HRHP) and National Register of Historic Places (NRHP); listed on NRHP 4 October 1978 (#78001022); placed on HRHP 17 August 1997; no additional historic properties identified

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Hammatt and Shideler 2016	Archaeological literature review and field inspection	Technology Development Corporation Innovation Center, Lot “C,” TMK: [1] 2-1-015:052	No historic properties identified; documents that area was coastal shallows until being filled in during early 20th century (possibly in 1911); discusses possibility of subsurface seawall remnants
Turran et al. 2016	Archaeological monitoring	Ala Moana Blvd and Auahi St, TMKs: [1] 2-1-055, 056, 058, and 059: various parcels	No historic properties identified
Hammatt et al. 2017	Archaeological literature review and field inspection	Kamehameha Hwy Force Main project, TMKs: [1] 1-1-003:239 por.; 1-2-021:035 por. and 036 por.	No historic properties identified; discusses Keʻehi Lagoon Beach Park and concrete slab on grade as potential historic properties (no SIHP #s assigned)
Rivera and Monahan 2017	Archaeological monitoring	Kakaʻako Makai (Parcels A, C, D, E, I, and L), TMKs: [1] 2-1-015:051 and 061; 2-1-058:006, 048, 129, and 130 (por.); 2-1-060:027	Inspected 420 soil cores from three parcels (240 in parcel A, 60 in parcel E and 120 in parcel I); no historic properties identified during this project; no traditional Hawaiian artifacts or midden deposis observed; no human skeletal remains or burial sites observed during this project
Blahut and Hammatt 2018	Archaeological inventory survey	Entrepreneur’s Sandbox, Kakaʻako Makai, TMK: [1] 2-1-015:052	Identified one historic property: SIHP # -8049, buried structural remnants and cultural deposits associated with Fort Armstrong, a military fort present within study area in first half of 20th century
Pammer, et al. 2018	Archaeological monitoring	Nimitz Hwy and Ala Moana Blvd, TMKs: [1] 2-1, 2-3, and 2-6 (various plats and parcels)	Four archaeological historic properties identified: SIHP # -4573, subsurface remnants of pond sediment (Loko Kaipuni); SIHP # -7435, human skeletal remains (Features A–D); SIHP # -7436, human skeletal remains; and SIHP # -8037, buried historic surfaces

Reference	Type of Study	Location	Results (SIHP # 50-80-14)
Vernon et al. 2018	Archaeological monitoring	Pier 34/35 Honolulu Harbor project, TMKs: [1] 1-5-034:004 por., 026 por., 032; 1-5-036:001 por., 002 por., and 010	Identified three historic properties: a historic box culvert and drain (SIHP # -7675), a historic railroad (SIHP -7819), and remnant deposits of a former fishpond (SIHP # -7828); multiple fill layers observed and one in situ pond layer encountered in a deeper excavation (176-190+ cmbs)
Zapor and Hammatt 2018	Archaeological monitoring	Kakaako Pumping Station, TMK: [1] 2-1-015:063	Further documentation of Kakaako Pumping Station (SIHP # -9710) with one newly identified feature consisting of stacked brick and mortar wet-well with concrete cap and cast iron pipes leading from Kaka‘ako Pumping Station (Feature 1)

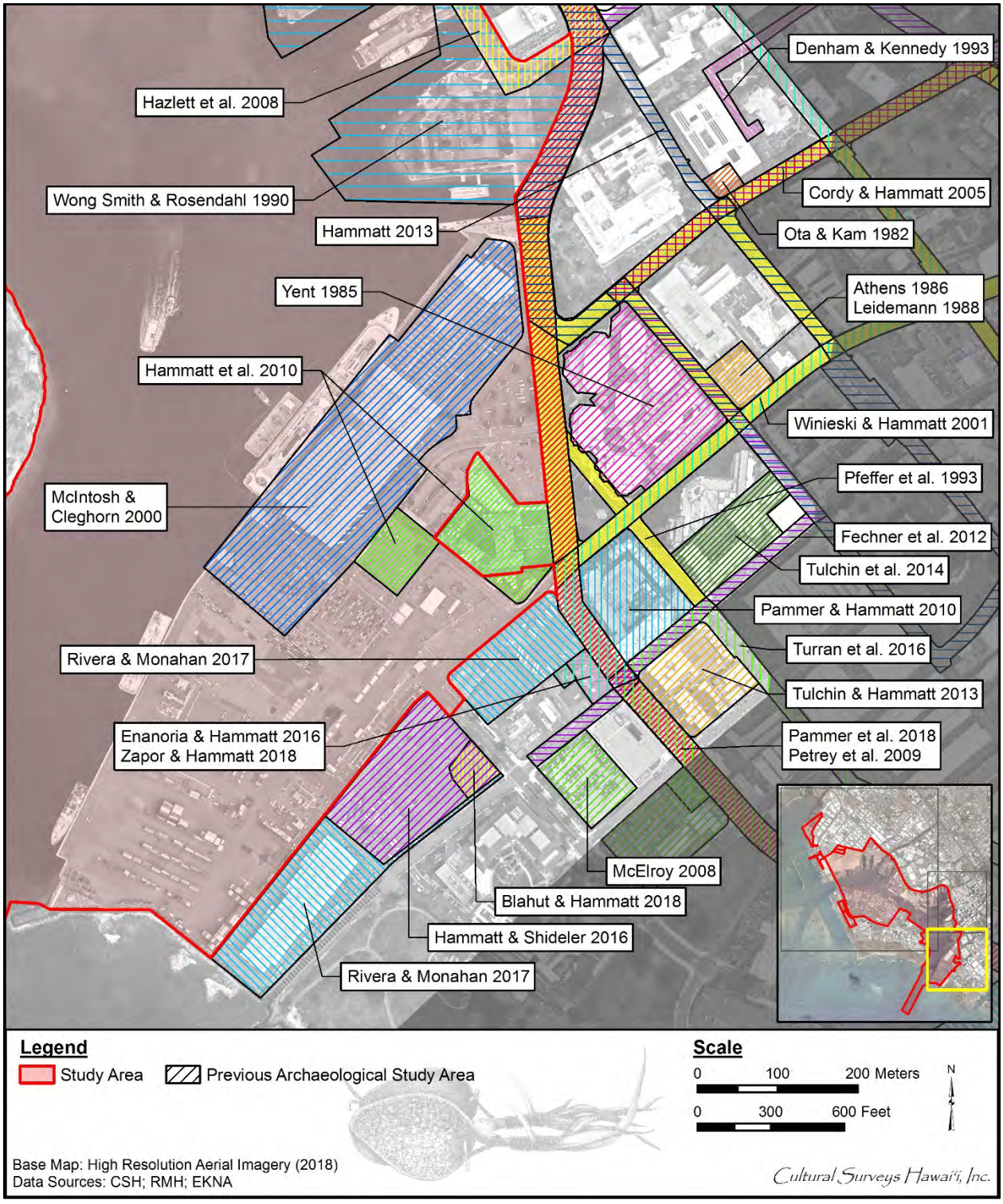


Figure 121. High Resolution Aerial Imagery (2018) with previous archaeological studies near the Kaka‘ako portion of the study area

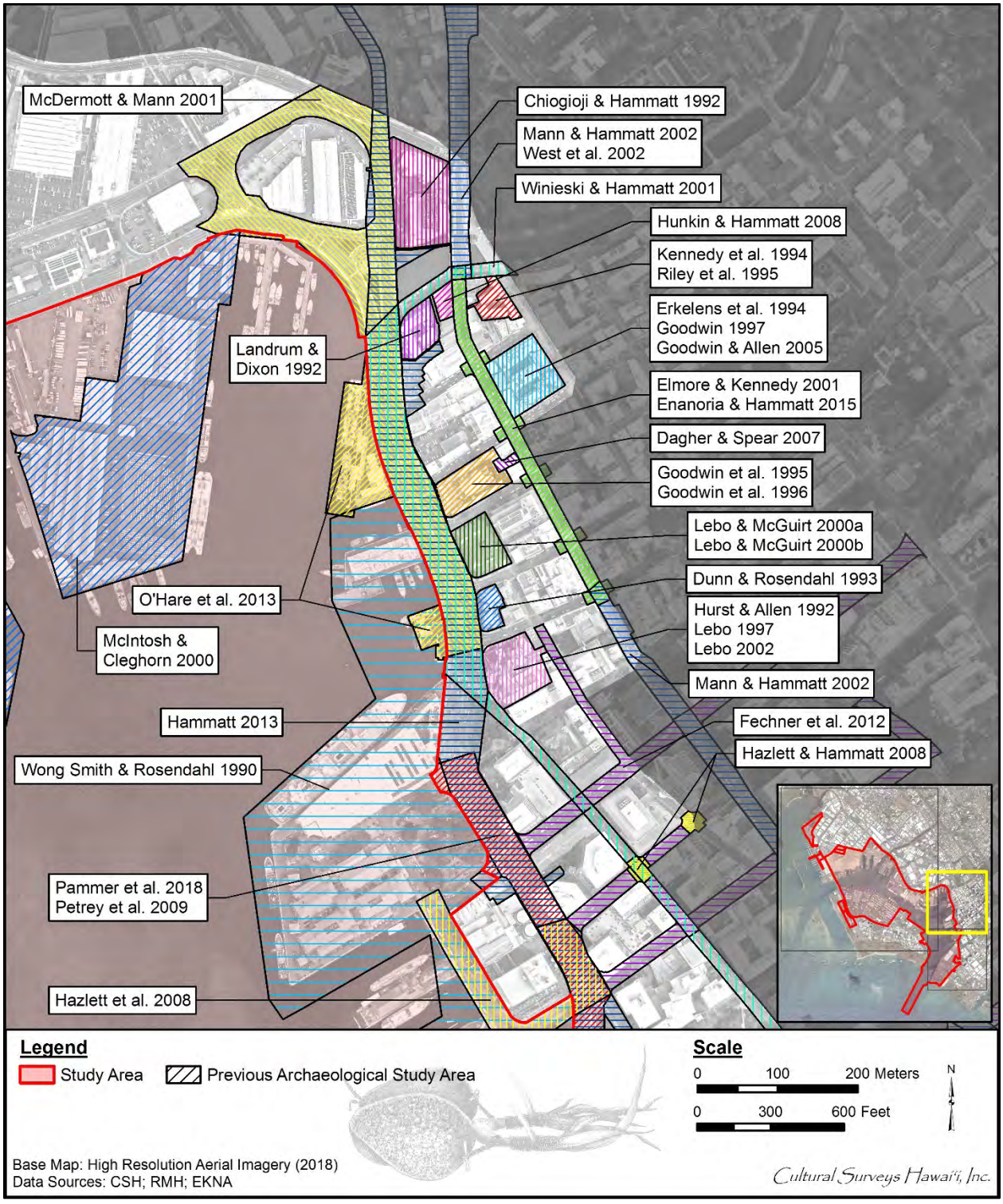


Figure 122. High Resolution Aerial Imagery (2018) with previous archaeological studies near the downtown Honolulu portion of the study area

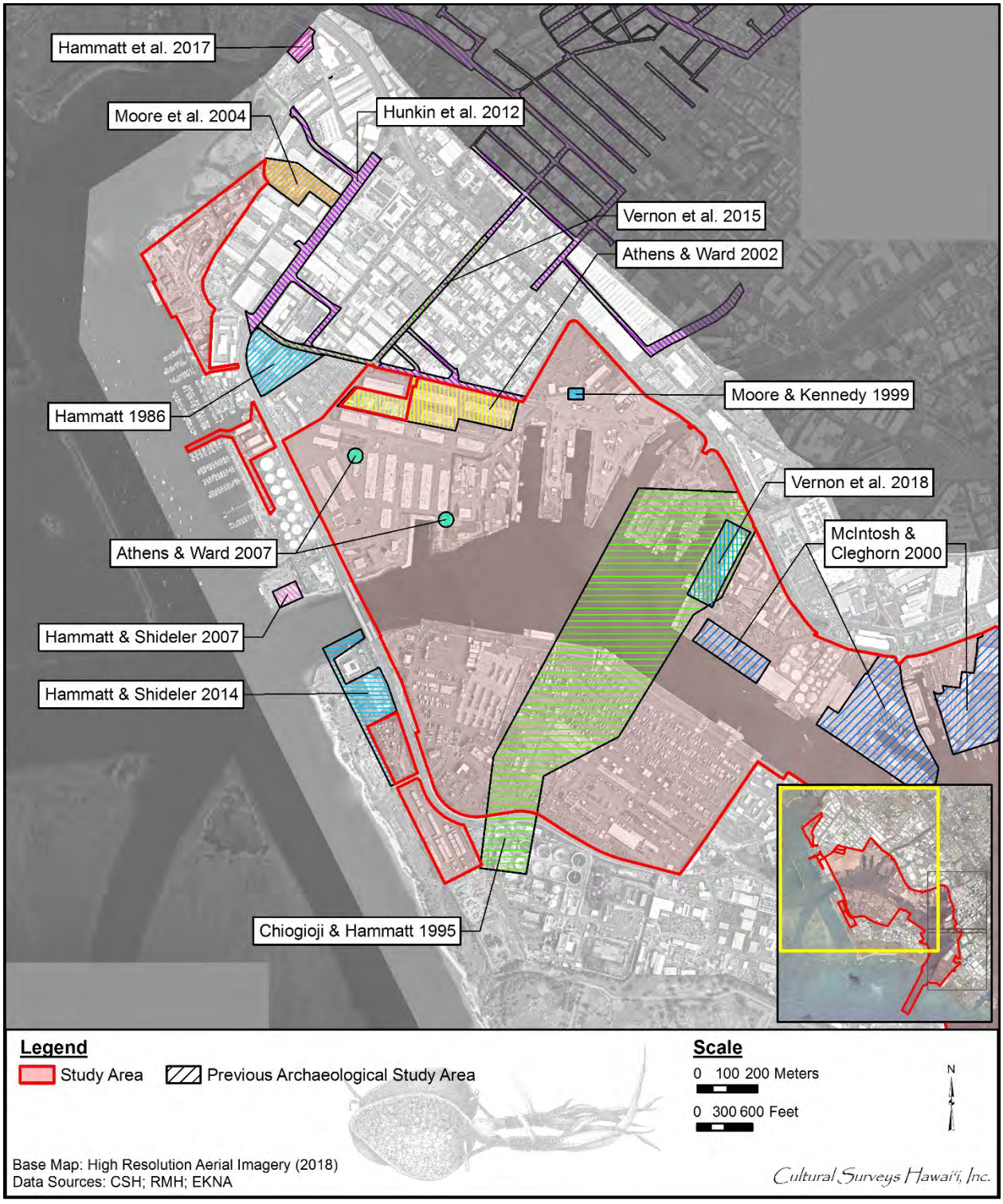


Figure 123. High Resolution Aerial Imagery (2018) with previous archaeological studies near the Kalihi portion of the study area

Table 7. Previously identified historic properties near the study area (historic properties within the study area are in bold)

SIHP # 50-80-14-	Description	Source	Comments
0073 (McAllister Site 73)	**Ananoho and Auiki fishponds**	**McAllister 1933:90**	**McAllister lumps two fishponds under this designation (see Figure 126 for locations): Ananoho fishpond, an oval-shaped pond 52 acres in area, and Auiki, a small 12-acre adjoining pond with a 900-ft wall (see Figure 126 for location)**
0074 (McAllister Site 74)	**Pāhouiki, Pāhounui, and Apili fishponds**	**McAllister 1933:91**	**McAllister lumps three fishponds under this designation (see Figure 126 for locations): Pahouiki is 14 acres in area with a wall 1,050 ft in length, which is open to Pahounui, a pond of 26 acres with a wall 2,600 ft long, and adjoins but does not open to Apili pond, which is 28 acres in extent, with a wall 1,500 ft long**
1307	Historic Building State Tax Office (Hale Auhau)	NRHP form	NRHP Registration Form-Hawaii Capital Historic District (Designated building # 17 of nomination) 1976 (see Figure 124 for location)
1973	Subsurface cultural deposit	Athens 1986, Leidemann 1988	Included ceramics and bottles dating between 1880 and 1930 (see Figure 124 for location)
2456	Subsurface cultural deposit	Hurst 1991, Hurst and Allen 1992, Dunn and Rosendahl 1993, Lebo 2002	lncluded layers, beginning at surface: rubble fill associated with 1950 demolition of buildings; 19th century building foundations in some areas; a post-1845 layer; “transitional” Contact period (1794-1845) layer; and a pre-Contact layer (see Figure 125 for location)
2918	Ka‘ākaukukui Cemetery	Yent 1985, Hammatt 2013	Subsurface cultural deposit and six human burials at Honolulu Ironworks project (see Figure 124 for location)
2963	Subsurface cultural deposit	Ota and Kam 1982, Hammatt 2013	Subsurface cultural deposit, subsurface pond deposit, human burials, and faunal burials (see Figure 124 for location)
4192	Subsurface cultural deposit	Landrum and Dixon 1992	Seven features including two partially disturbed pre-Contact traditional Hawaiian features including soft-tissue human remains, as well as five disturbed, post-Contact features (see Figure 125 for location)

SIHP # 50-80-14-	Description	Source	Comments
4494	Subsurface cultural deposit and human burials	Goodwin et al. 1996	Entire Marin Tower property designated SIHP # -4494, includes 28 post-Contact burial features and remains of several displaced human skeletal remains, pre-Contact fire pits, and early post-Contact structural foundations associated with residence of Marin family from about 1810 to 1850; numerous associated pre- and post-Contact artifacts documented (see Figure 125 for location)
4533	Human burial	Pfeffer et al. 1993	Single set of human remains on Halekauwila St (see Figure 124 for location)
4587	Fishpond	Kennedy et al. 1994, Riley et al. 1995	Small fishpond, yielded an early 10th century date (see Figure 125 for location)
4588	Subsurface cultural deposit	Kennedy et al. 1994, Riley et al. 1995	Multi-component site consisting of 53 features dating from 20th century to pre-Contact including three human burials (see Figure 125 for location)
4605	Subsurface cultural deposit	Denham and Kennedy 1993	Included one human burial, a historic trash pit, a ditch, a pit, a fire pit, and six postholes; charcoal samples from two features dated; Feature 4605:E, a fire pit, dated to between AD 1390~1700, and Feature 4605:H, a posthole, originated from between AD 860-1330, with high probability it was associated with occupation during late 12th century (see Figure 124 for location)
4875	Subsurface cultural deposit and human burials	Erkelens et al. 1994, Goodwin 1997	Over 100 features and six cultural layers; features include postholes, fire pits, trash pits, wall remnants, and foundation remnants, and span in age from pre-Contact to historic; also identified four sets of human skeletal remains (see Figure 125 for location)
5496	Subsurface cultural deposit	Lebo and McGuirt 2000a, b	Subsurface cultural layer containing both pre- and post-Contact archaeological features, including trash pits, post molds, coral block floors and walls, basalt and coral foundation walls, and fire pits (see Figure 125 for location)

SIHP # 50-80-14-	Description	Source	Comments
5581	**Human burial**	**Moore 1997, Moore and Kennedy 1999**	**Primary burial, probably post-Contact (see Figure 126 for location)**
5781	Human burial	Elmore and Kennedy 2001	One in situ flexed human burial, between Maunakea St and Smith St (see Figure 125 for location)
5942	Manhole and trolley rail	Winieski and Hammatt 2001; West et al. 2002	Historic brick-lined manhole and remnant of light gauge trolley rail (see Figure 125 for location)
5966	***Loko i‘a* (Kawa Fishpond)**	**McDermott and Mann 2001, Hammatt 2013**	**Subsurface remnants of Kawa Fishpond (see Figure 125 for location)**
6889	Human burials	Dagher and Spear 2007	Two human burials, likely Native Hawaiian (see Figure 125 for location)
6926	Structural remnants and artifact cache	Dagher and Spear 2007	Historic mortared basalt foundation wall and ceramic storm drain containing cache of ceramic vases (see Figure 125 for location)
7190	Salt pan remnants	Hammatt 2013	Subsurface salt pan remnants (see Figure 124 for location)
7413	Subsurface structural remnants and trash layer	Tulchin and Hammatt 2013	Surface and subsurface features predominantly associated with property’s development and utilization as Hawaiian Sugar Planters Immigration Station (reinforced concrete building, buried concrete structural remnants, and subsurface trash layers) (see Figure 124 for location)
7427	Subsurface cultural deposit	Hammatt 2013	Included subsurface infrastructure remnants, subsurface cultural deposits, and human skeletal element
7428	Subsurface cultural deposit and structural remnants	Hammatt 2013	Subsurface cultural deposit and historic building foundation

SIHP # 50-80-14-	Description	Source	Comments
7436	Human burial	Pammer et al. 2018	Single human femur with fragmented distal end, observed during utility excavations in non-burial context (see Figure 125 for location)
7512	Structural remnants	Tulchin et al. 2014	Five buried concrete slabs, concrete foundation remnant, and slab with wall segment, associated with early to mid-20th century development (see Figure 124 for location)
7513	Post-Contact trash layer	Tulchin et al. 2014	Associated with early 20th century land reclamation (see Figure 124 for location)
7575	Pier 12	O'Hare et al. 2014	Original dock built 1823, modified extensively up to 1950s
7576	Pier 15	O'Hare et al. 2014	Original dock constructed ca. 1900 on fill land, modified extensively up to 1970s (building currently on pier not considered a historic property)
7675	**Box culvert and drain**	**Vernon et al. 2018**	**Constructed between late 1940s and 1952 (see Figure 126 for location)**
7808	Kapālama Drainage Canal	Yucha and Hammatt 2016	Kapālama Drainage Canal extending from Niuhelewai and Kapālama streams to Kapālama Basin in Honolulu Harbor, completed in 1939 (see Figure 126 for location)
7819	**Railroad remnants**	**Vernon et al. 2018**	**Multiple tracks recorded running parallel to existing access road, along with intermittent tracks recorded during excavations within an existing warehouse; historic railroad would have been used for hauling fruit to and from canneries (beginning in early 1930s, Pier 35 used for interisland shipment of pineapples) (see Figure 126 for location)**
7828	**Fishpond deposits**	**Vernon et al. 2018**	**Gleyed pond layer associated with pre-Contact *loko i‘a* (traditional Hawaiian fishpond) observed at 176–190+ cmbs at base of excavation; no structural features of buried *loko i‘a* (e.g., a fishpond wall) encountered (see Figure 126 for location)**
8037	Subsurface building remnants	Pammer et al. 2018	Buried historic building remnants, consists of concrete slabs likely associated with early to mid-20th century warehouse (see Figure 124 and Figure 125 for location)

SIHP # 50-80-14-	Description	Source	Comments
8049	Fort Armstrong (buried structural remnants and deposits)	Blahut and Hammatt 2018	Basalt boulder and coral sea wall remnants, polished concrete floor, and former oil-rolled surface, all associated with military fort present in first half of 20th century (see Figure 124 for location)
9061	Honolulu Star-Bulletin Building	NRHP form	NRHP Registration Form–Honolulu Star-Bulletin Building 2009 (see Figure 125 for location)
9700	***Falls of Clyde* (ship)**	**Wong Smith and Rosendahl 1990**	**1878 four-masted ship (see Figure 124 and Figure 125 for location)**
9710	Kakaako Pumping Station	NRHP Form, Enanoria and Hammatt 2016; Zapor and Hammatt 2018	NRHP Registration Form–Kakaako Pumping Station 1978; Zapor and Hammatt 2018 describe one newly identified feature of SIHP # -9710: Feature 1 consists of stacked brick and mortar wet-well with concrete cap and cast iron pipes leading from Kaka‘ako Pumping Station (see Figure 124 for location)
9714	OR&L Right-of-Way	NRHP Form	NRHP Registration Form–Oahu Railway and Land Company Right-of-Way 1983 (see Figure 126 for location)
9829	**Irwin Memorial Park**	**NRHP Form, Wong Smith and Rosendahl 1990**	**Constructed in early 1930s; NRHP Registration Form–Irwin Memorial Park 1999 (see Figure 125 for location)**
9900	Dillingham Transportation Building	NRHP Form	Built in 1929; NRHP Registration Form–Dillingham Transportation Building 1972 (see Figure 125 for location)
9903	Kamehameha V Post Office	NRHP Form	NRHP Registration Form–Kamehameha V Post Office 1972 (see Figure 125 for location)
9905	Bishop Bank	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Friend Building	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)

SIHP # 50-80-14-	Description	Source	Comments
9905	Judd Building	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Melchers Building	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Old Police Station (W.M. Gibson Building)	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Royal Saloon	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Stagenwald Building	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	T.R. Foster Building	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9905	Yokohama Specie Bank	NRHP Form	Part of NRHP Registration Form–Merchant Street Historic District 1973 (see Figure 125 for location)
9925	Alexander and Baldwin Building	NRHP Form	NRHP Registration Form–Alexander and Baldwin Building 1972 (see Figure 125 for location)
9929	**Aloha Tower**	**NRHP Form, Wong Smith and Rosendahl 1990**	**NRHP Nomination Form–Aloha Tower 1973 (see Figure 125 for location)**
9938	C. Brewer Building	NRHP Form	NRHP Registration Form–C. Brewer Building 1973 (see Figure 125 for location)
9964	**US Immigration Complex**	**NRHP Form**	**NRHP Nomination Form–U.S. Immigration Complex 1972 (see Figure 124 for location)**
9986	**Chinatown Historic District**	**NRHP Form; McIntosh and Cleghorn 2000**	**NRHP Nomination Form–Chinatown Historical District 1972**
no SIHP # assigned	**Historic piers 8–11**	**Wong Smith and Rosendahl 1990**	**Construction on Piers 8–11 began ca. 1918**

SIHP # 50-80-14-	Description	Source	Comments
no SIHP #	**Historical account of burial ground**	**Richardson 2008**	**Richardson shares an account from Sister Leopoldina Burns, caregiver at Kapi‘olani Home for Girls, about a burial ground from an earlier public health crisis, which would have been near *makai* end of present-day Waiakamilo Rd**

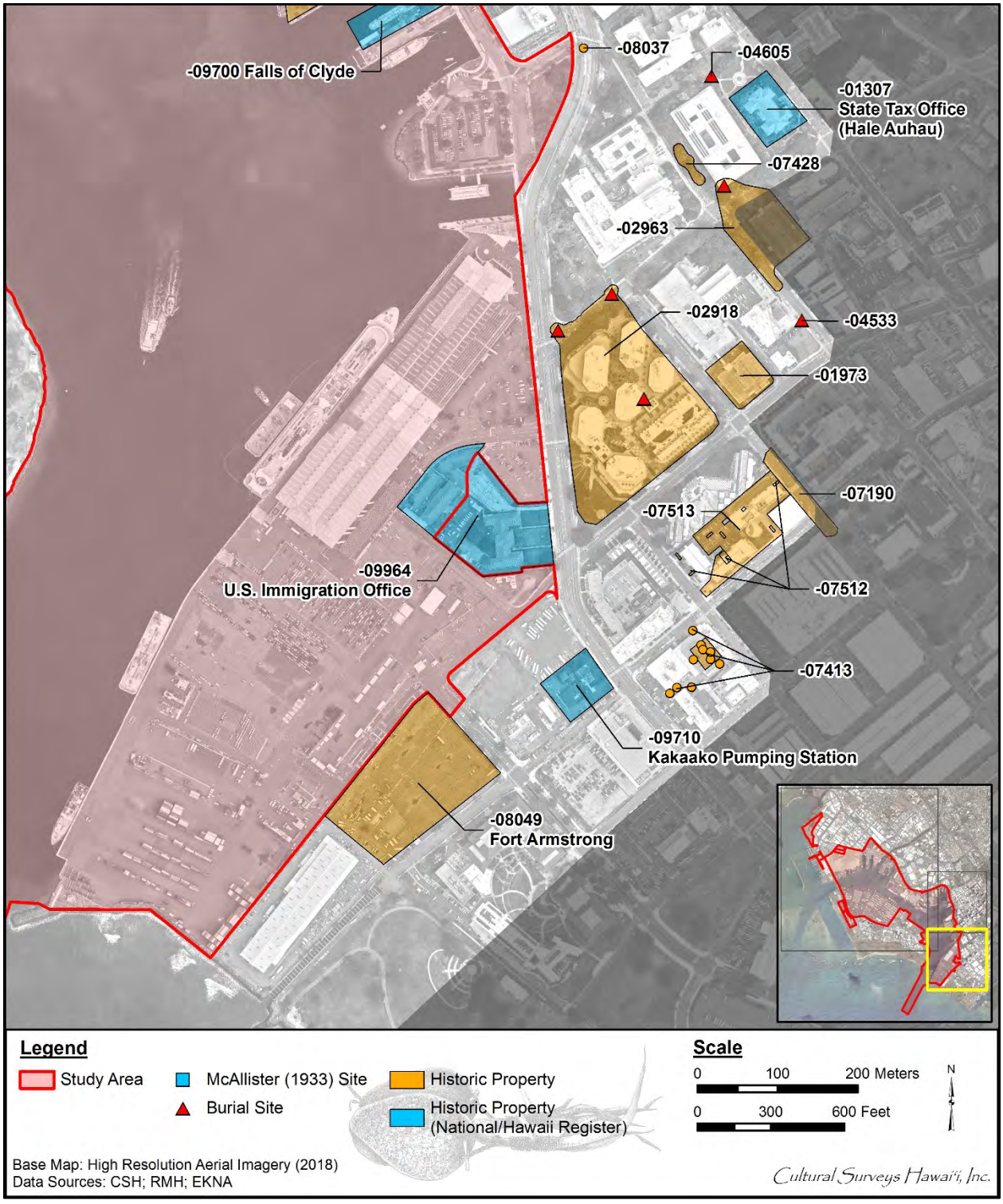


Figure 124. High Resolution Aerial Imagery (2018) with previously identified historic properties within the southeastern (Kaka‘ako) portion of the study area

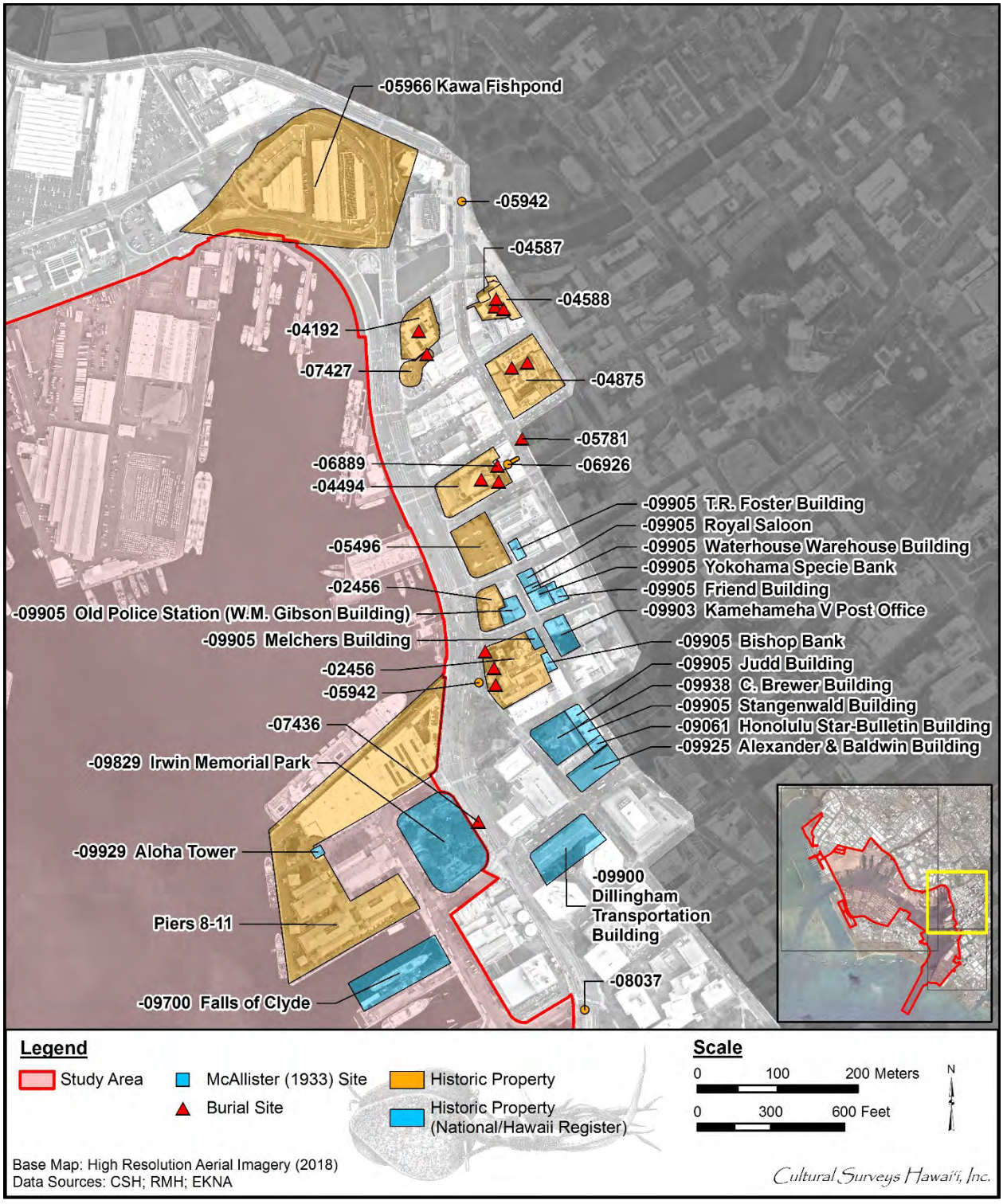


Figure 125. High Resolution Aerial Imagery (2018) with previously recorded historic properties within the central (downtown Honolulu) portion of the study area

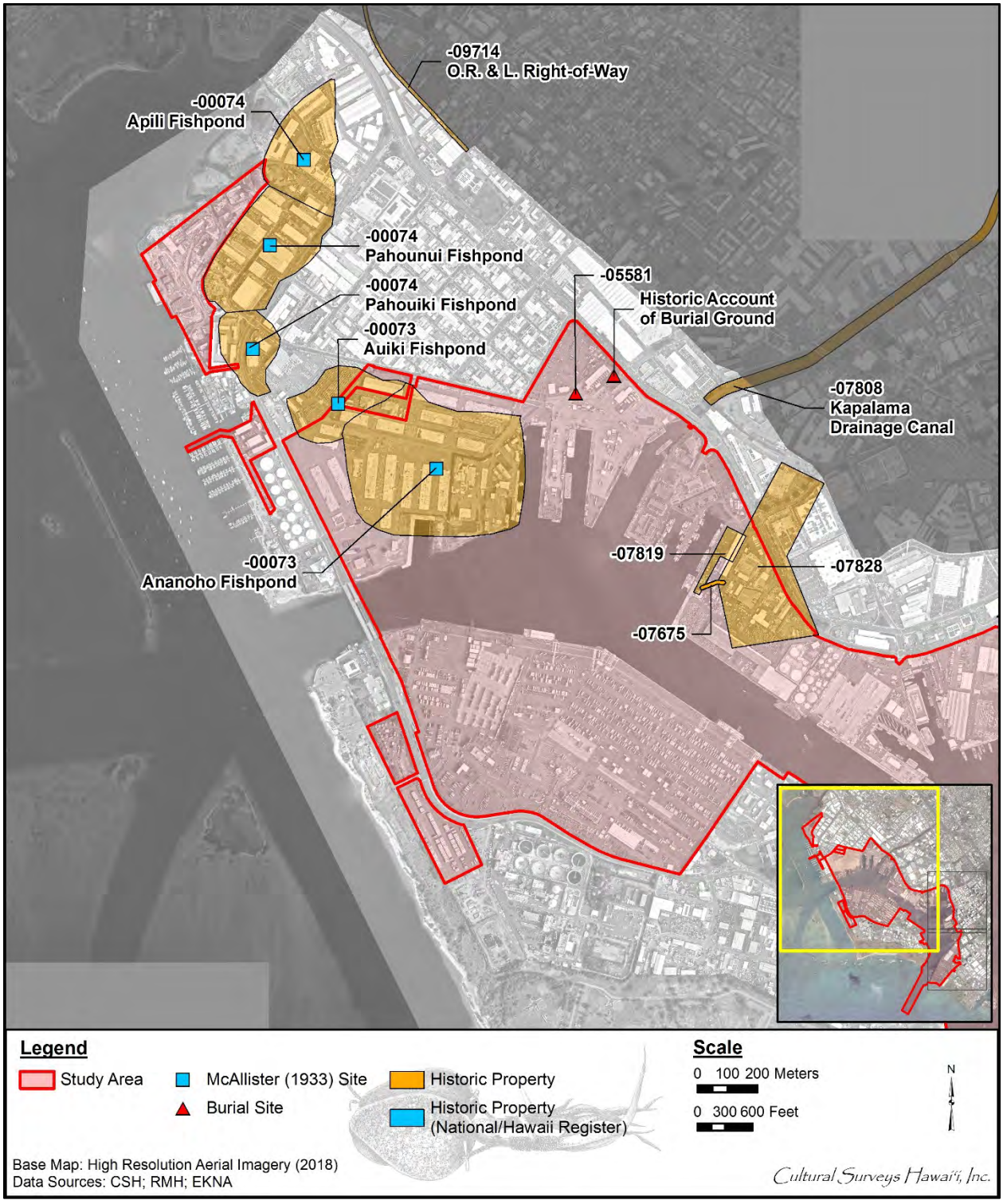


Figure 126. High Resolution Aerial Imagery (2018) with previously recorded historic properties within the northwestern (Kalihi) portion of the study area

Table 8. Previously identified historic properties within the study area

SIHP # (50-80-14-)	Formal Type	Function
0073	Ananoho Fishpond	Traditional Hawaiian aquaculture
0073	Auiki Fishpond	Traditional Hawaiian aquaculture
0074	Pāhouiki Fishpond	Traditional Hawaiian aquaculture
0074	Pāhounui Fishpond	Traditional Hawaiian aquaculture
0074	Apili Fishpond	Traditional Hawaiian aquaculture
5581	Human Burial	Human interment
5966	Kawa Fishpond	Traditional Hawaiian aquaculture
7675	A historic box culvert and drain	Drainage
7819	A historic railroad	Transport, particularly for hauling pineapples to and from canneries
7828	Remnant deposits of a former fishpond	Traditional Hawaiian aquaculture
9042	Chinatown Historical District	Historic district
9700	*Falls of Clyde*	Transportation
9829	Irwin Memorial Park	Landscape, recreation, and culture
7380	Aloha Tower	Clock tower

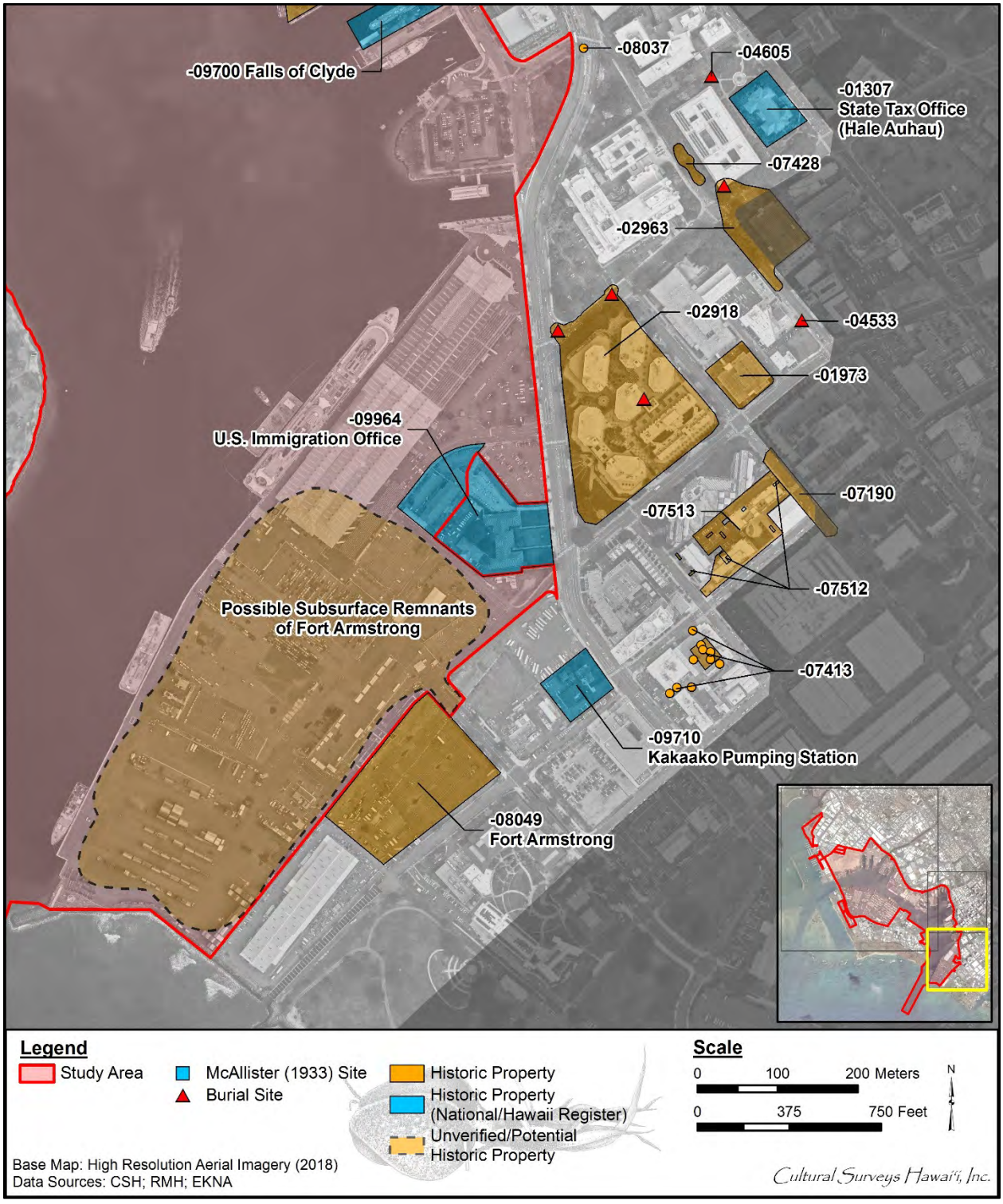


Figure 127. High Resolution Aerial Imagery (2018) showing the Kaka‘ako portion of the study area with locations of previously identified historic properties within and surrounding the study area, as well as indicated areas of potential subsurface historic properties

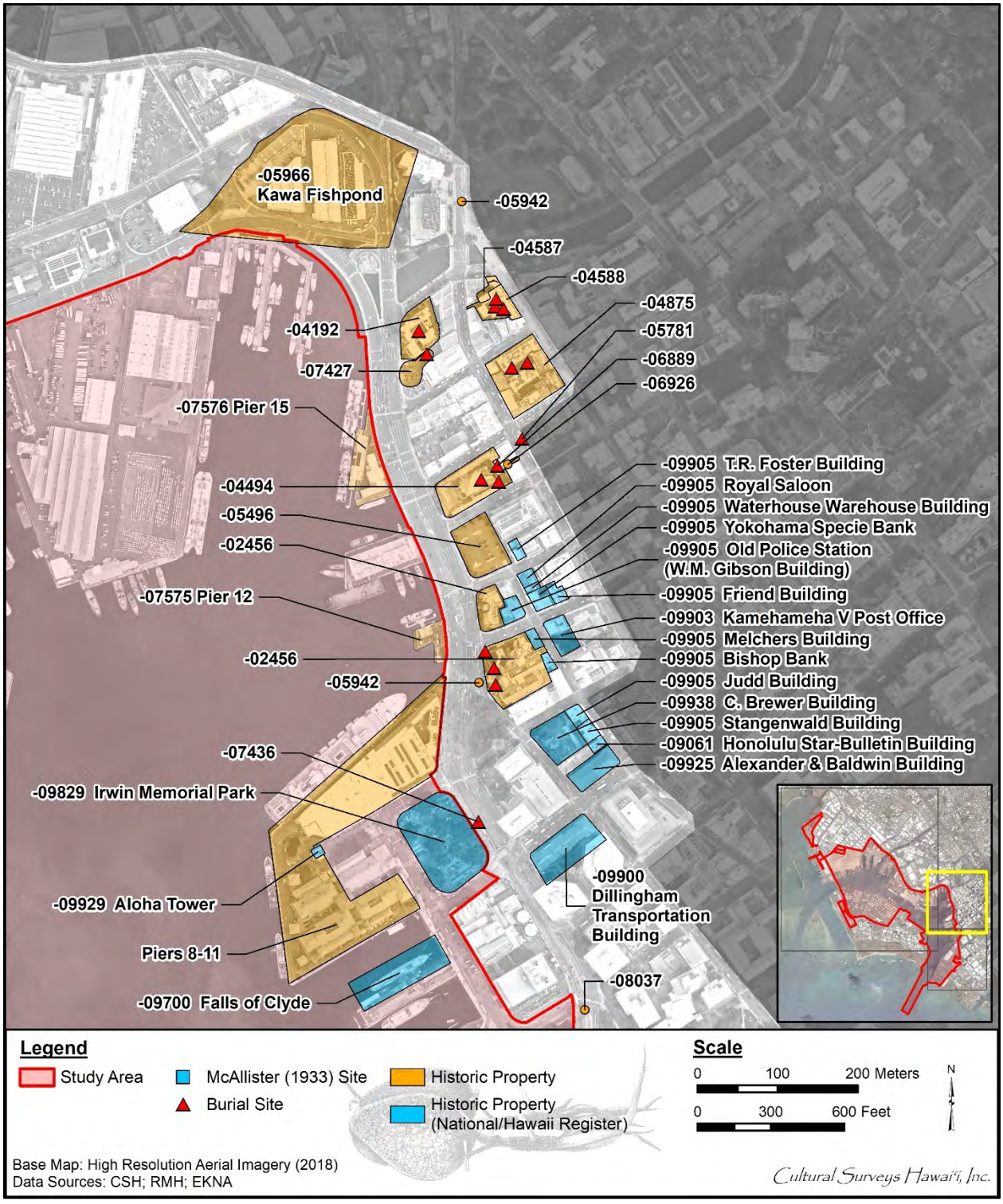


Figure 128. High Resolution Aerial Imagery (2018) showing the downtown Honolulu portion of the study area with locations of previously identified historic properties within and surrounding the study area, as well as indicated areas of potential subsurface historic properties

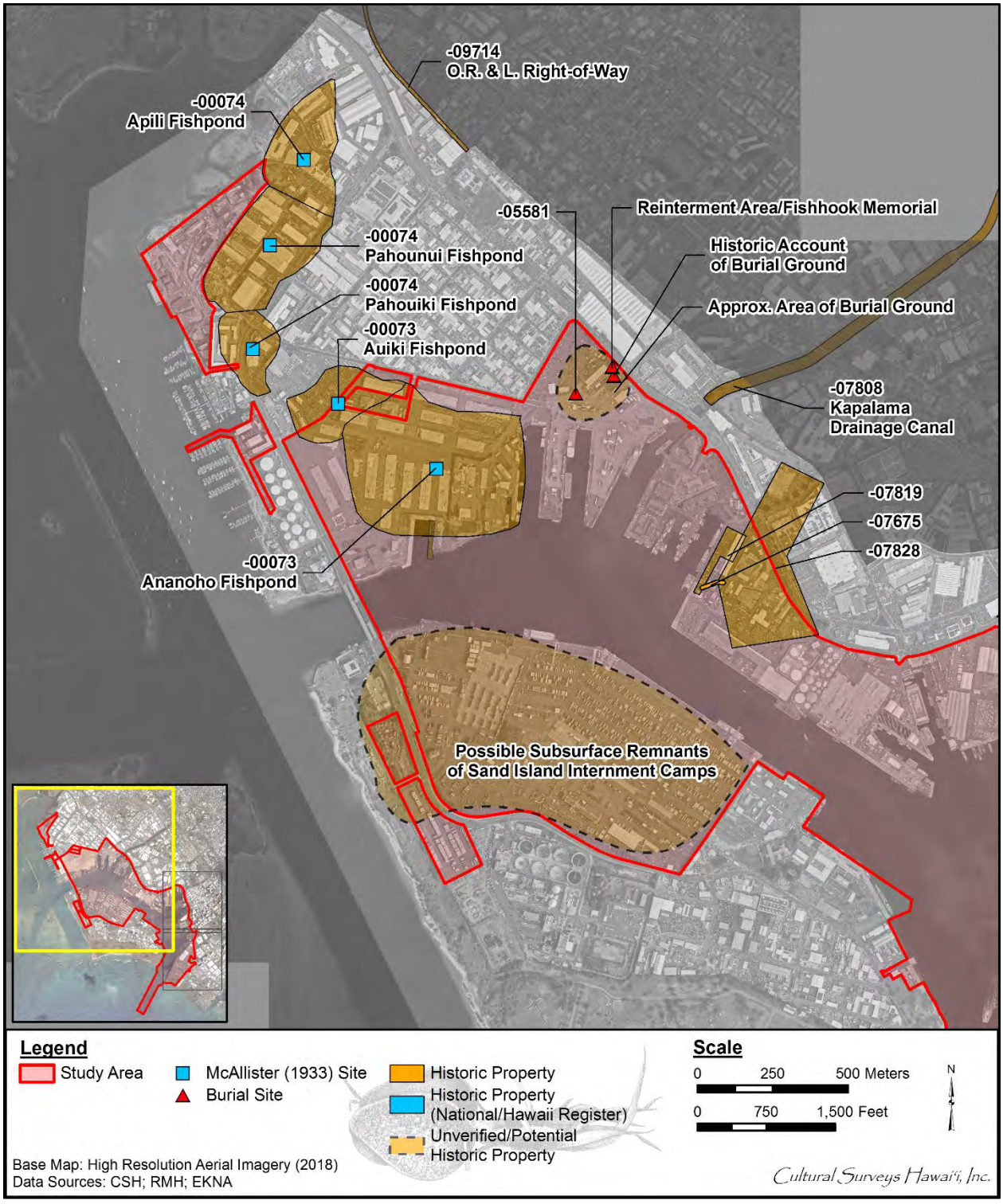


Figure 129. High Resolution Aerial Imagery (2018) showing the Iwilei, Kalihi Kai, and Sand Island portions of the study area with locations of previously identified historic properties within and surrounding the study area, as well as indicated areas of potential subsurface historic properties

Table 9. Previously identified historic properties and potential archaeological historic properties identified in the Honolulu Harbor Master Plan project

SIHP # (50-80-14-)	Description	Location	Source
7575	Pier 12 (Brewer's Wharf)	Pier 12	O'Hare et al. 2014; Graves et al. 2017
7576	Pier 15	Pier 15	O'Hare et al. 2014; Graves et al. 2017
9042	Chinatown Historic District	Piers 13–15	NRHP registration form
9700	*Falls of Clyde*	Pier 7	NRHP registration form
9829	Irwin Memorial Park	Piers 8–11	NRHP registration form
9929	Aloha Tower	Pier 9	Wong Smith and Rosendahl 1990; NRHP registration form
9964	U.S. Immigration Complex	Pier 2	NRHP registration form
(no SIHP #)	Piers 8–11	Piers 8–11	Wong Smith and Rosendahl 1990
(no SIHP #)	Burial preserve/fishhook memorial	Piers 39–40 (Young Brothers property)	None
CSH 1	Historic curb/road alignments (Ala Moana Blvd and Allen St)	Northeast of Piers 5 and 6	Current study
CSH 2	Railroad tracks remnants	Piers 24 and 28	Current study
CSH 3	Structural remnants	Pier 32 (Honolulu Freight Services property)	Current study
CSH 4	Cut basalt and mortar wall and drainage ditch	Pier 32 (JFC International property)	Current study
CSH 5	Railroad track remnants	Pier 36	Current study
CSH 6	Railroad track remnants	Piers 41–43	Current study
CSH 7	Former pier structural remnants	Piers 41–45	Current study

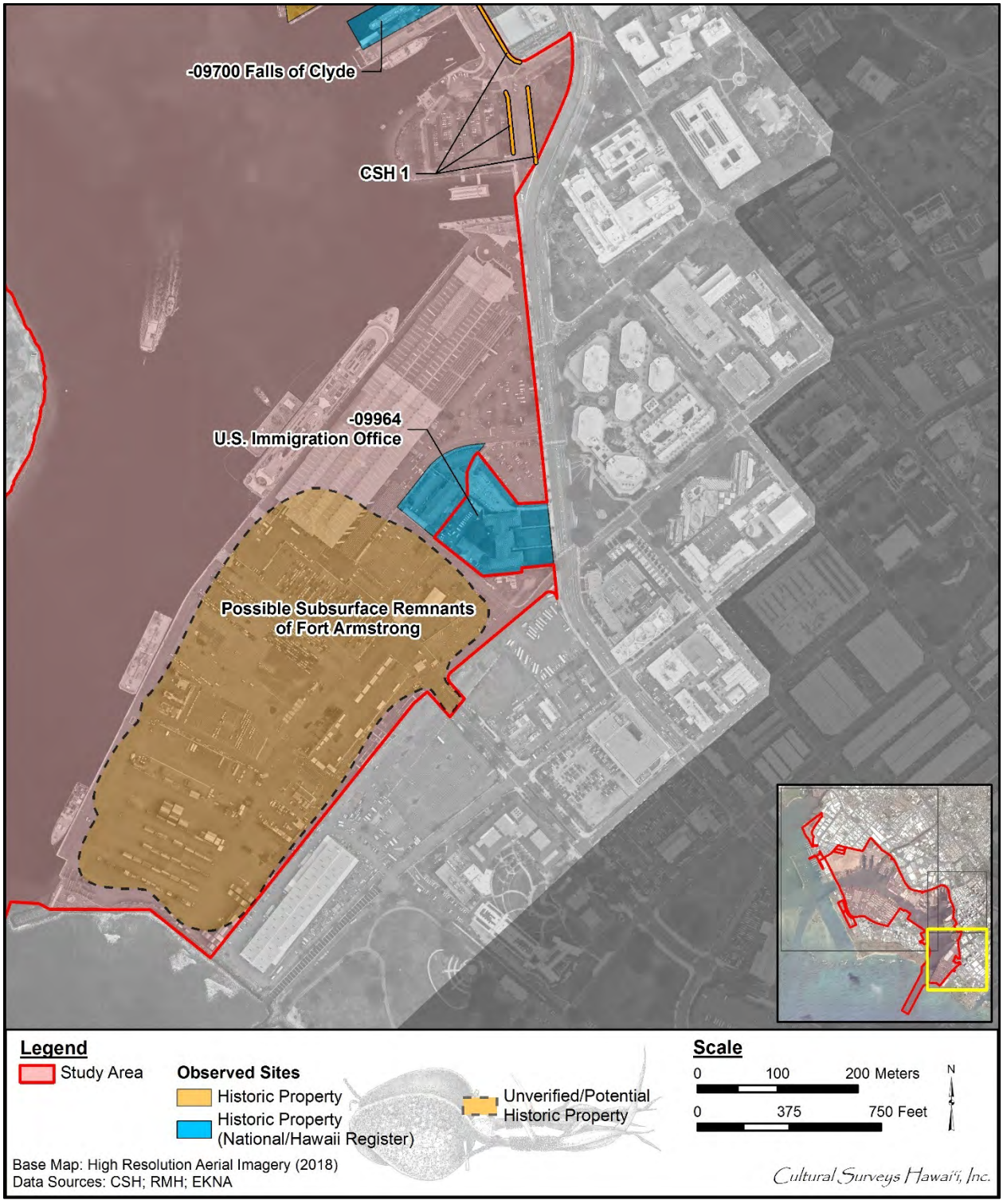


Figure 268. High Resolution Aerial Imagery (2018) showing the Kaka‘ako portion of the study area with locations of previously identified historic properties and potential archaeological historic properties within the surveyed pier areas

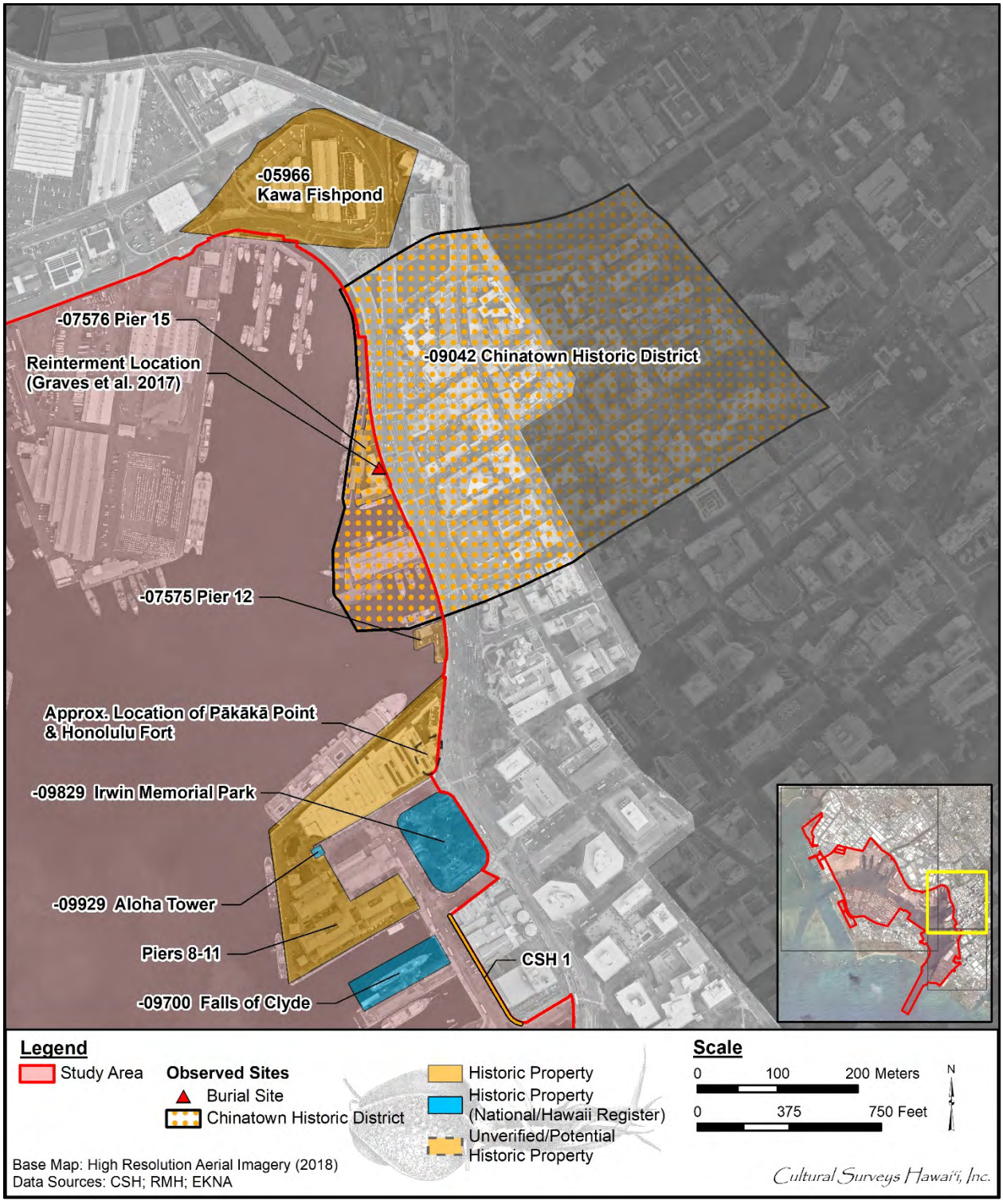


Figure 269. High Resolution Aerial Imagery (2018) showing the downtown Honolulu portion of the study area with locations of previously identified historic properties and potential archaeological historic properties within the surveyed pier areas

Figure 270. High Resolution Aerial Imagery (2018) showing the Iwilei, Sand Island, and Kalihi Kai portions of the study area with locations of previously identified historic properties and potential archaeological historic properties within the surveyed pier areas

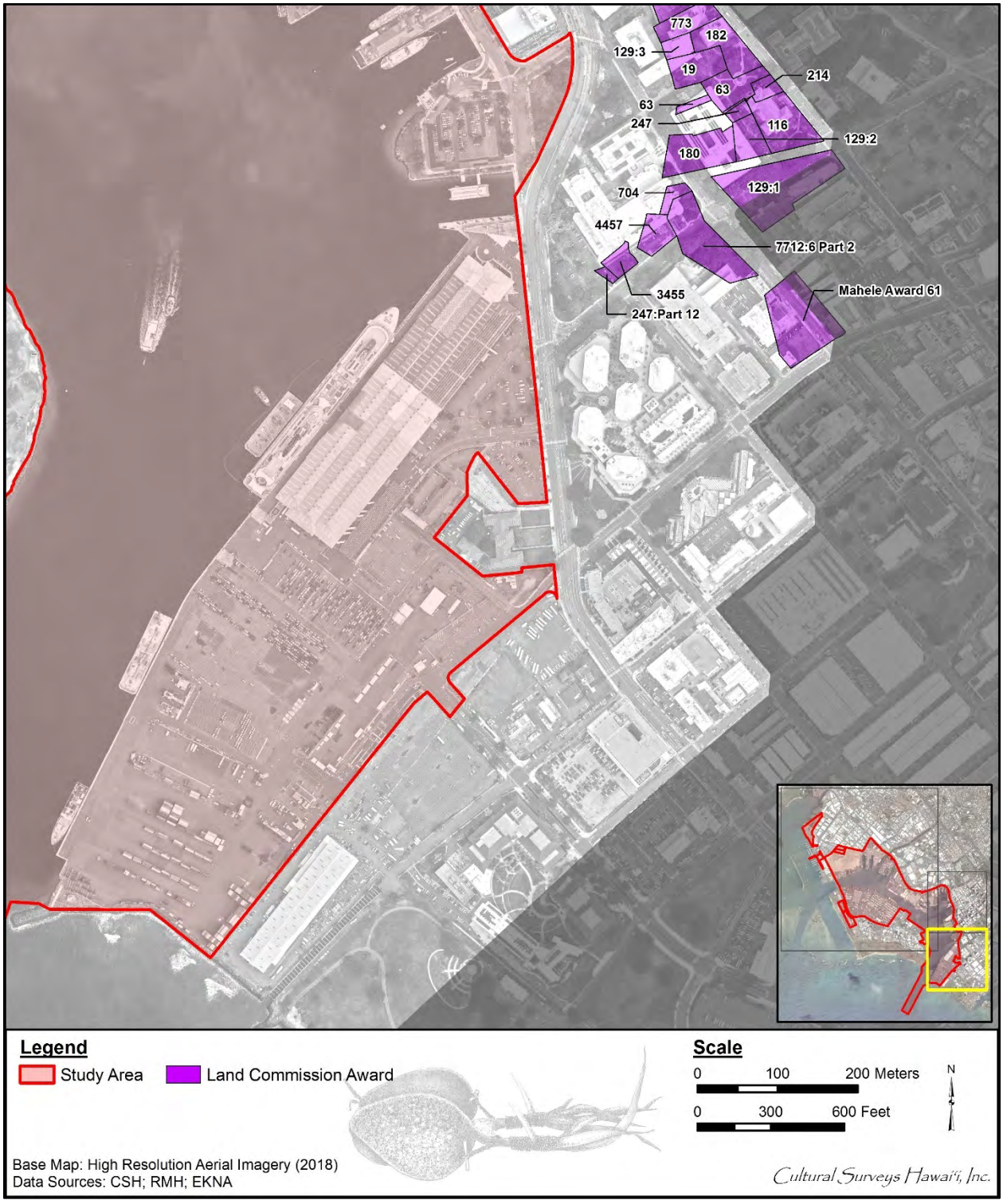


Figure 41. Aerial imagery with study area marked and showing LCAs in the vicinity of the Kaka‘ako portion of the study (Piers 1 through 7)

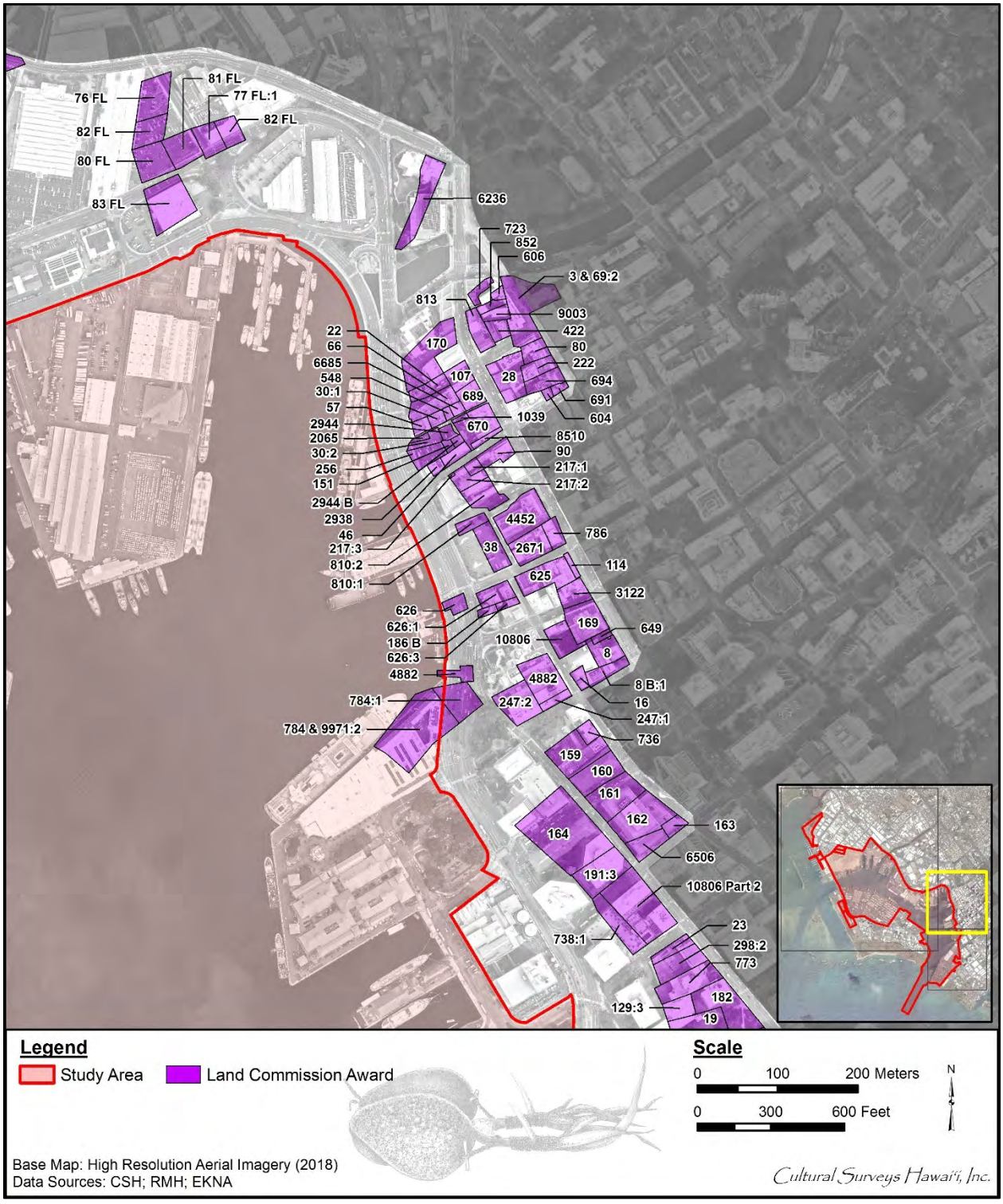


Figure 42. Aerial imagery with study area marked and showing LCAs in the vicinity of the downtown Honolulu portion of the study area (Piers 7 through 22)

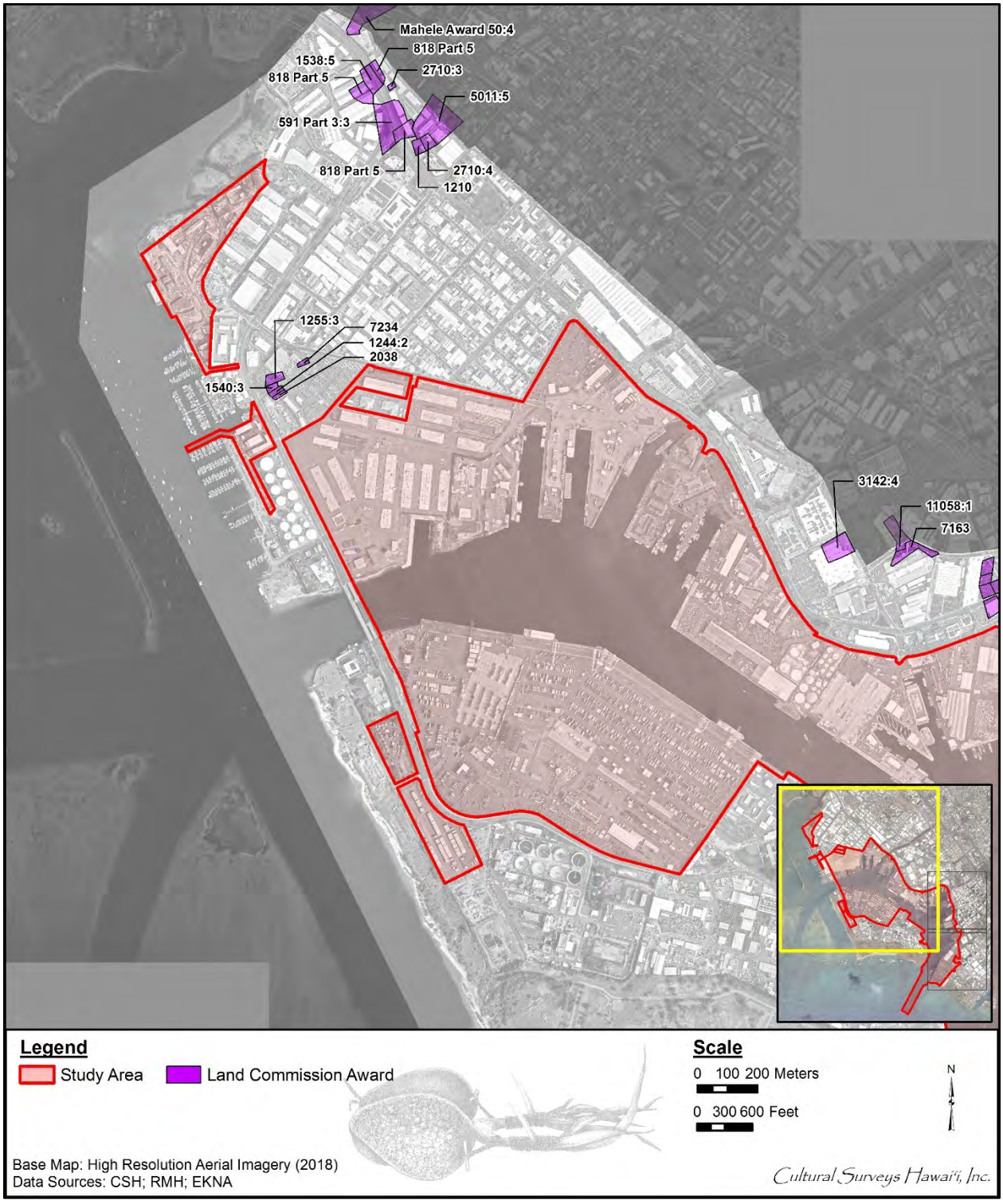


Figure 43. Aerial imagery with study area marked and showing LCAs in the vicinity of the Kapālama portion of the study area (Piers 22 through 45, 51 through 53, and 60)

APPENDIX K

ARCHITECTURAL RECONNAISSANCE LEVEL SURVEY – INVENTORY OF ELIGIBLE HISTORIC PROPERTIES (FUNG ASSOCIATES INC., 2021)

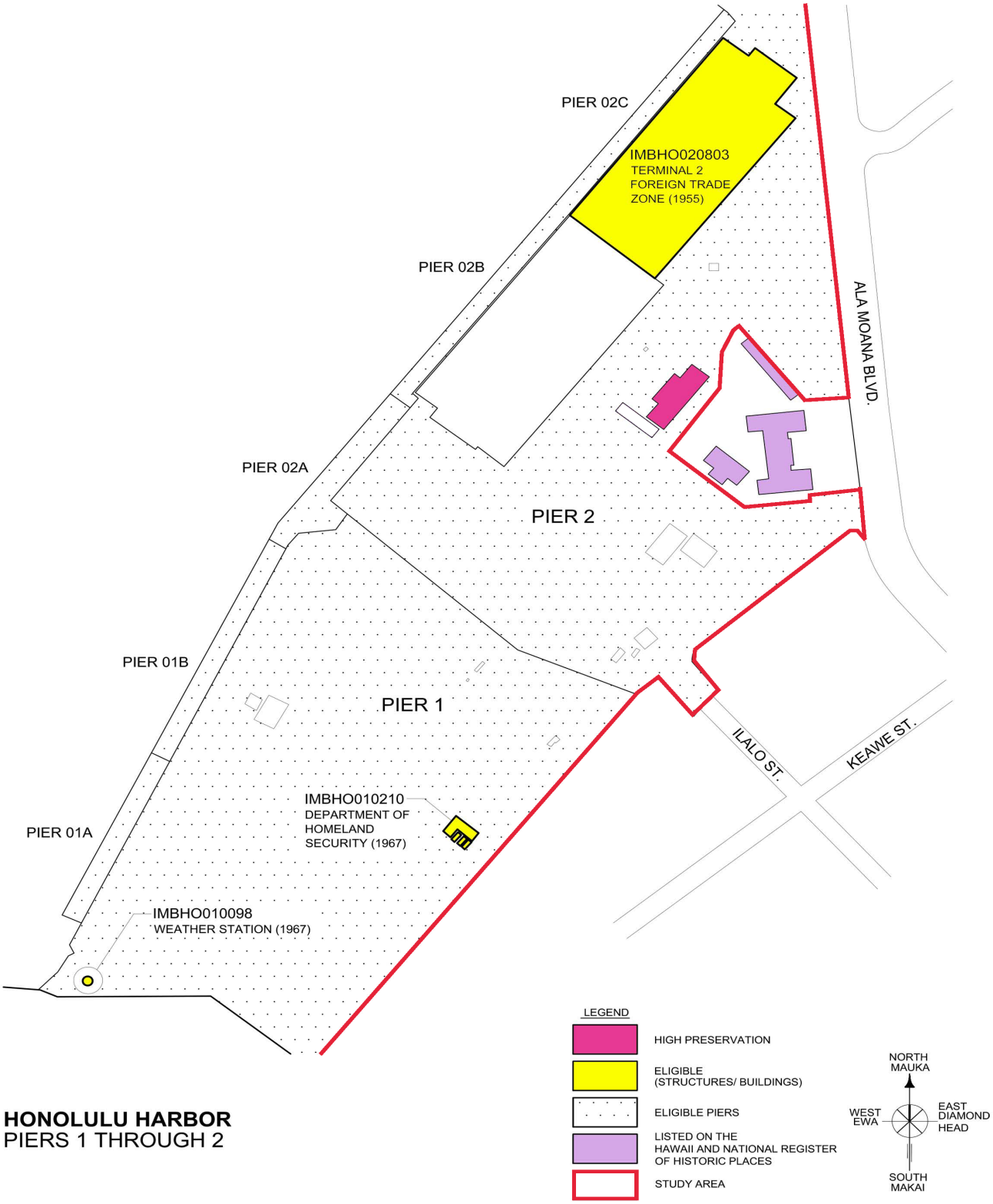


Figure 9: Pier 1 Through 2 Map
Source: Fung Associates Inc. (2019)

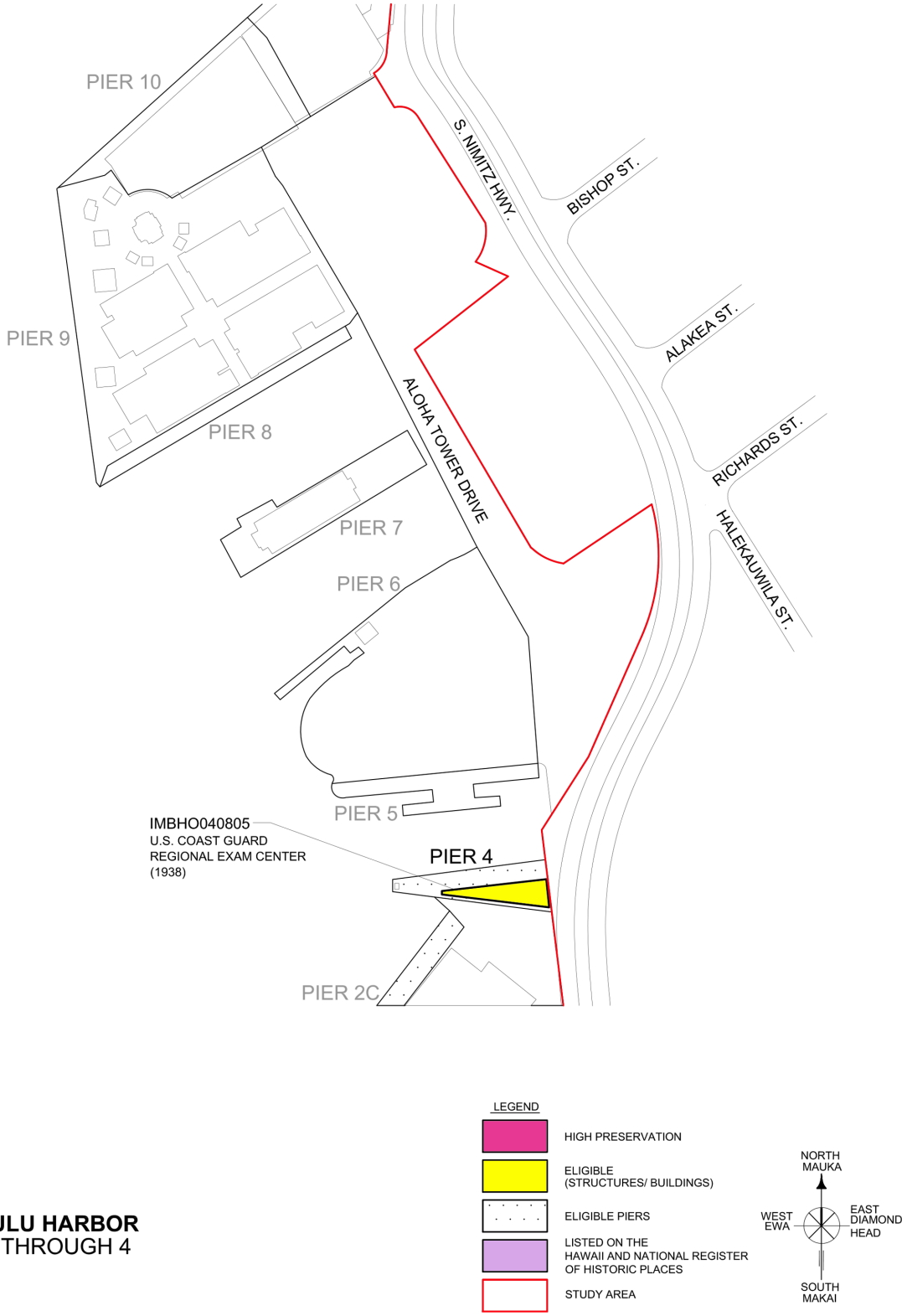


Figure 13: Pier 3 Through 4 Map
Source: Fung Associates Inc. (2019)

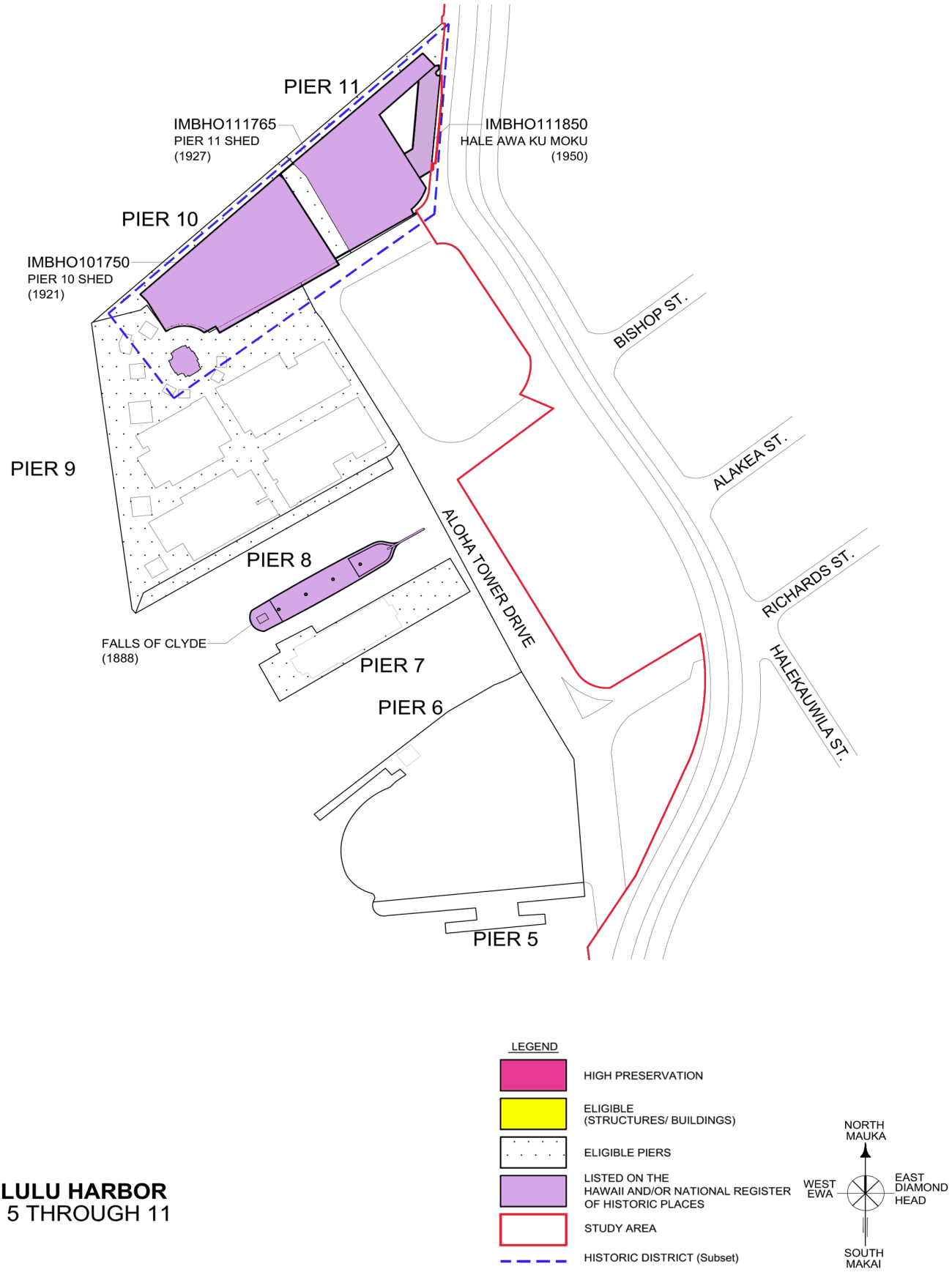


Figure 15: Piers 5 Through 11 Map
Source: Fung Associates Inc. (2019)

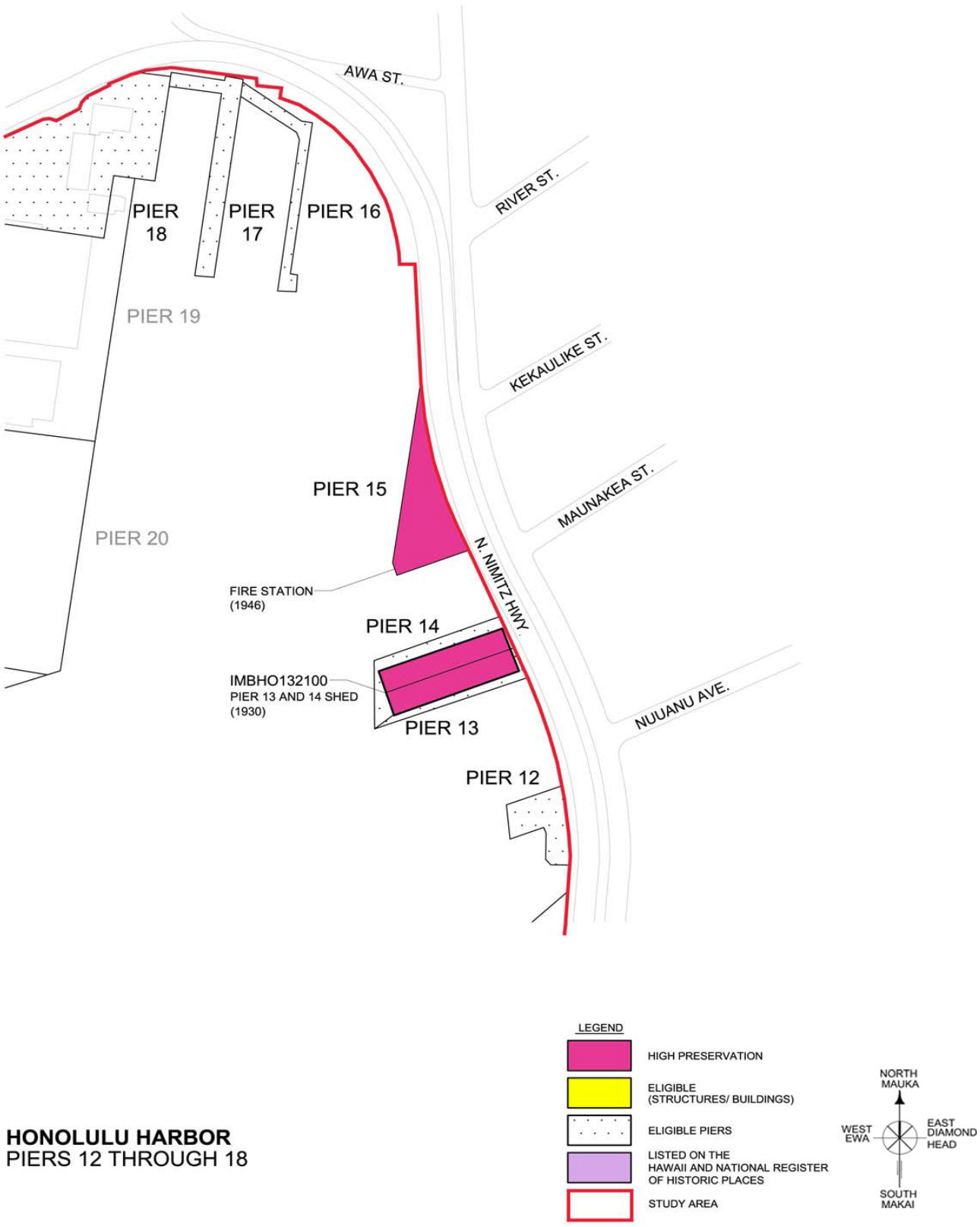


Figure 19: Pier 12 Through 18 Map
Source: Fung Associates Inc. (2019)

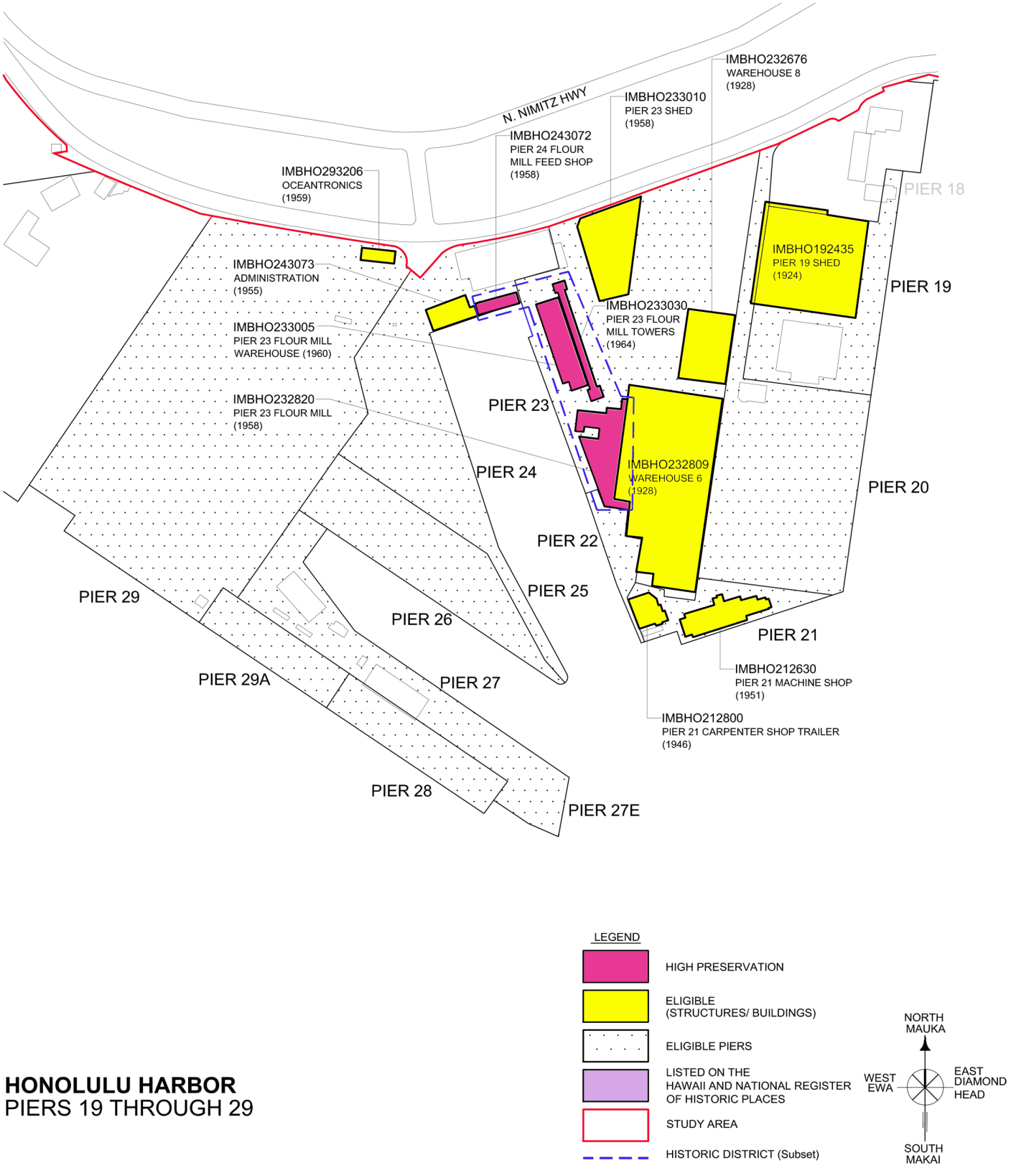
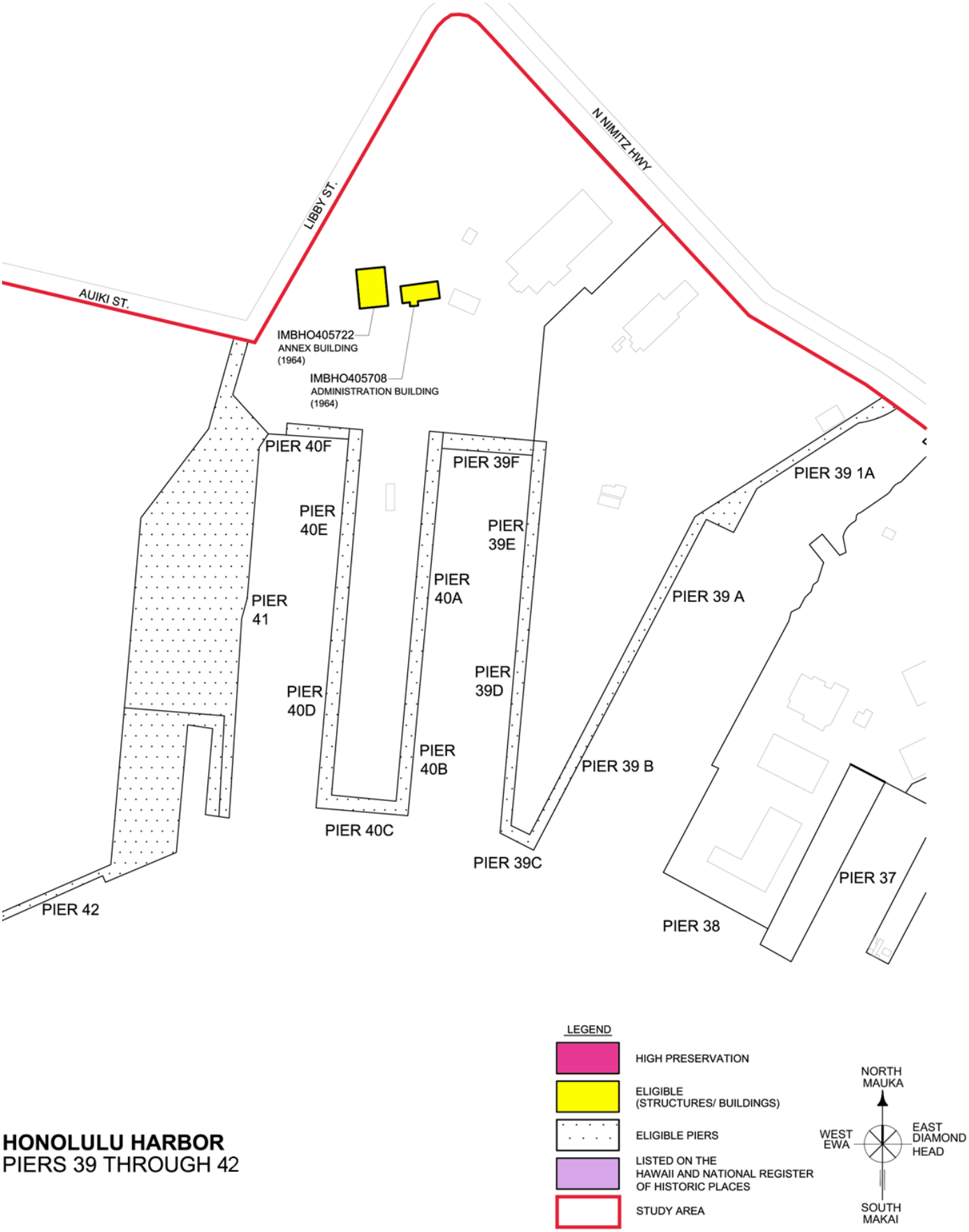


Figure 23: Pier 19 Through 29 Map
Source: Fung Associates Inc. (2019)

Figure 25: Piers 30 Through 35 Map
Source: Fung Associates Inc. (2019)

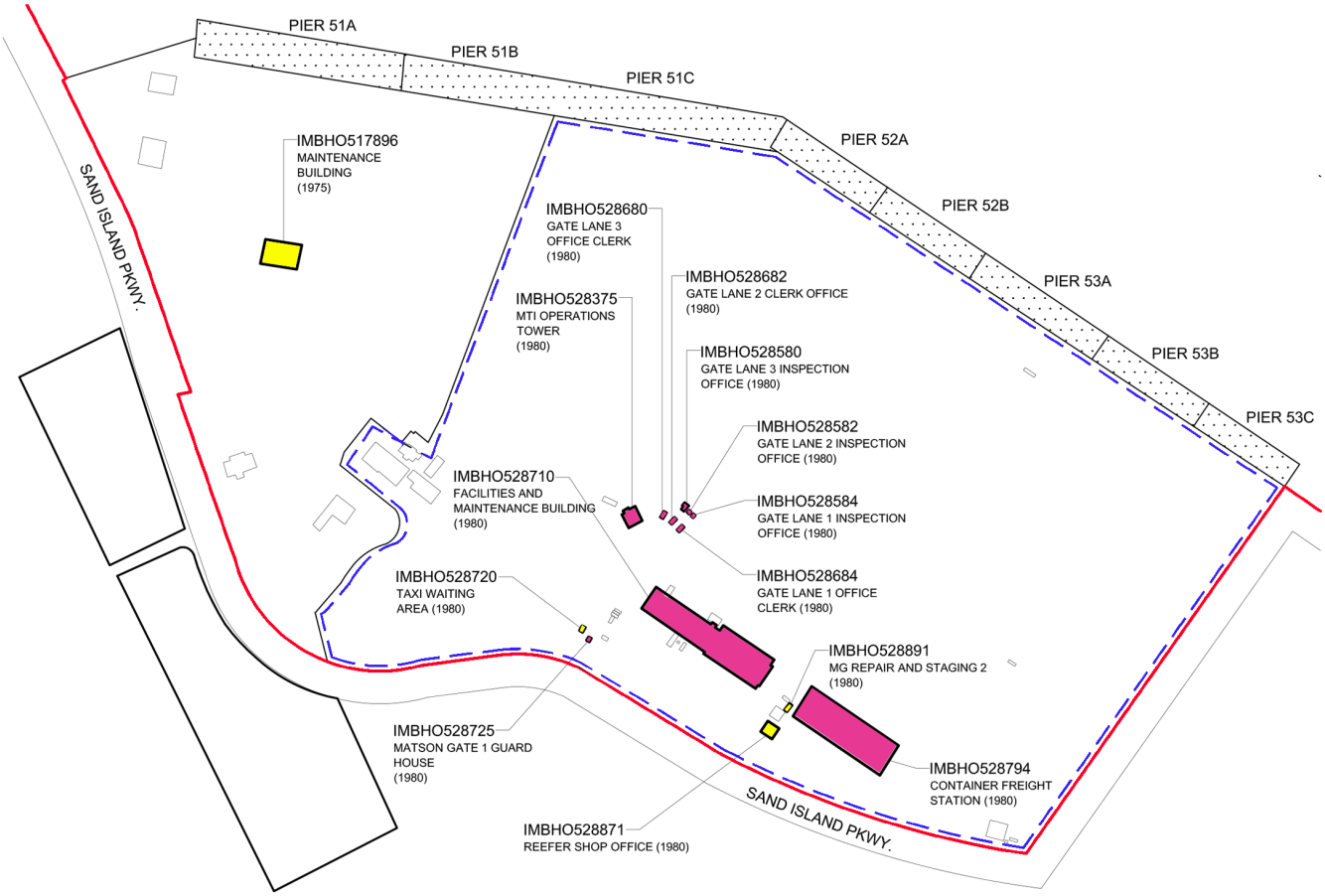
Figure 26: Piers 36 Through 38 Map
Source: Fung Associates Inc. (2019)

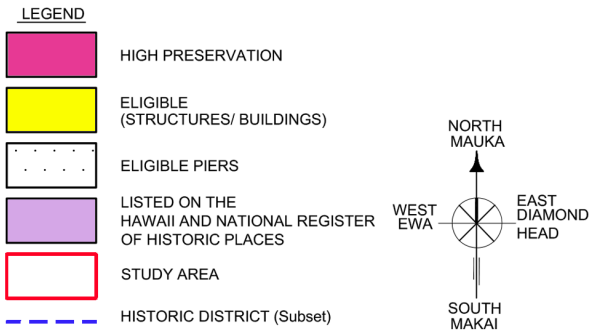


HONOLULU HARBOR
PIERS 39 THROUGH 42

Figure 29: Piers 39 Through 42 Map
Source: Fung Associates Inc. (2019)

**Pier 43 Map included with the Keehi Baseyard Map (Figure 32)*





HONOLULU HARBOR
PIERS 51 THROUGH 53
(SAND ISLAND)

Figure 30: Piers 51 Through 53 Map
Source: Fung Associates Inc. (2019)

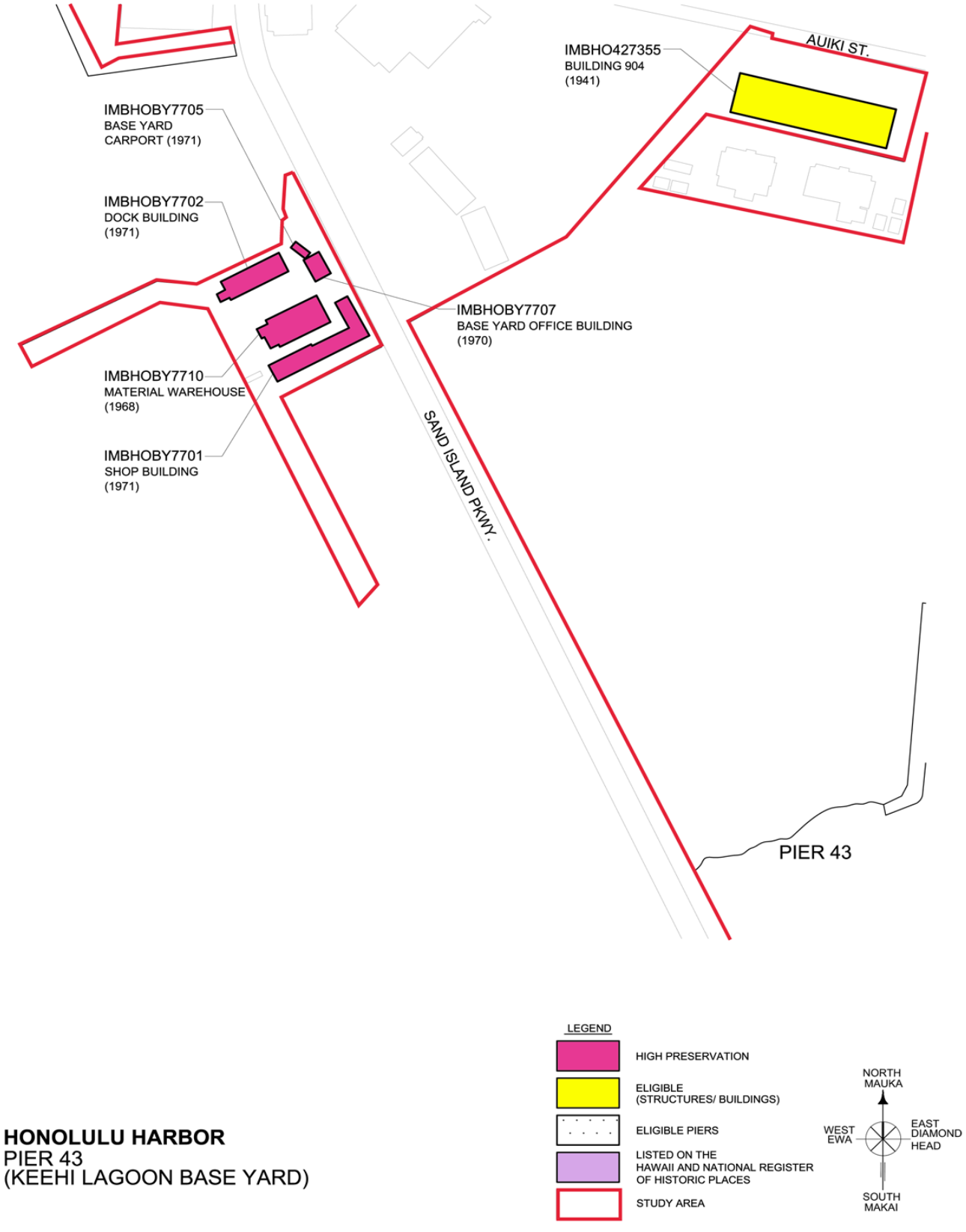


Figure 32: Keehi Lagoon Baseyard , Pier 43 Map
Source: Fung Associates Inc. (2019)

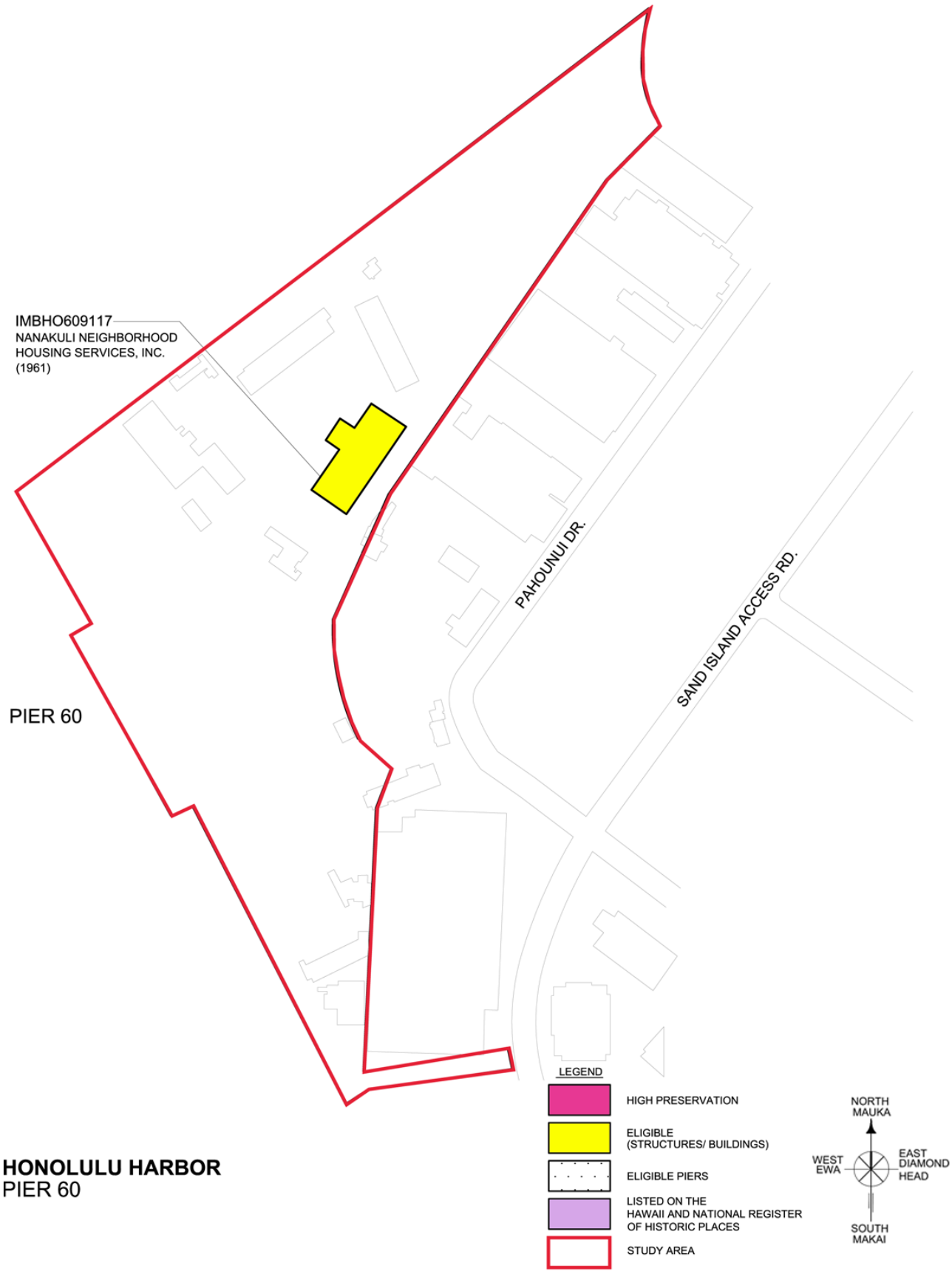


Figure 34: Pier 60 Map
Source: Fung Associates Inc. (2019)

APPENDIX A
HONOLULU HARBOR IDENTIFICATION OF HISTORIC PROPERTIES

Pier	TMK	DOT Building_ID	Eligibility	Contributing to a Potential District	Criterion	Condition	Common_Name	Current Owner	Address	Year Constructed	Builder/Architect	Data Sheet Page No. (In Report)
1	(1) 2-1-015:009	IMBHO010098	Individually Eligible	No	A and C	Poor	Weather Station /Aid To Navigation	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	1967	Unknown	66
1	(1) 2-1-015:009	IMBHO010144	Not Within Date Range	No	Not Applicable	Not Applicable	Building 1	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	1987	Not Applicable	
1	(1) 2-1-015:009	IMBHO010146	Not Within Date Range	No	Not Applicable	Not Applicable	Building 2	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	1987	Not Applicable	
1	(1) 2-1-015:009	IMBHO010160	Not Within Date Range	No	Not Applicable	Not Applicable	Pasha Hawaii Guard Shack	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2013	Not Applicable	
1	(1) 2-1-015:009	IMBHO010164	Not Within Date Range	No	Not Applicable	Not Applicable	Pasha Hawaii Office 1	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2009	Not Applicable	
1	(1) 2-1-015:009	IMBHO010210	Individually Eligible	No	A and C	Good	Department of Homeland Security	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	1967	Unknown	73
1	(1) 2-1-015:009	IMBHO010212	Not Within Date Range	No	Not Applicable	Not Applicable	HSI Trailer	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2013	Not Applicable	
1	(1) 2-1-015:009	IMBHO010214	Not Within Date Range	No	Not Applicable	Not Applicable	NYK Office	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2008	Not Applicable	
1	(1) 2-1-015:009	IMBHO010216	Not Within Date Range	No	Not Applicable	Not Applicable	HSI Office	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2008	Not Applicable	
1	(1) 2-1-015:009	IMBHO010250	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 1 Guard Shack	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2008	Not Applicable	
1	(1) 2-1-015:009	IMBHO010255	Not Within Date Range	No	Not Applicable	Not Applicable	US customs and Boarders Protection Guard Shack	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2008	Not Applicable	
2	(1) 2-1-015:009	IMBHO010278	Not Within Date Range	No	Not Applicable	Not Applicable	Pasha Hawaii Office 3	State DOT-Harbors Div	521 Ala Moana Boulevard, Honolulu, HI 96813	2008	Not Applicable	
2	(1) 2-1-015:009	IMBHO020274	Not Within Date Range	No	Not Applicable	Not Applicable	Pasha Hawaii Office 2	State DOT-Harbors Div		2008	Not Applicable	
2	(1) 2-1-015:009	IMBHO020276	Not Within Date Range	No	Not Applicable	Not Applicable	Pasha Hawaii Building	State DOT-Harbors Div		2008	Not Applicable	
2	(1) 2-1-015:009	IMBHO020300	Not Within Date Range	No	Not Applicable	Not Applicable	IAL Vehicle Processing Center	State DOT-Harbors Div		2016	Not Applicable	
2	(1) 2-1-015:009	IMBHO020305	Not Within Date Range	No	Not Applicable	Not Applicable	IAL Office and Machine Shop	State DOT-Harbors Div		2016	Not Applicable	
2	(1) 2-1-015:009	IMBHO020514	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 2 Cruise Terminal Guard Shack	State DOT-Harbors Div		2008	Not Applicable	
2	(1) 2-1-015:009	IMBHO020802	Not Eligible	No	Lost Integrity	Excellent	Terminal 2	State DOT-Harbors Div	521 Ala Moana Boulevard, Suite 256, Honolulu, HI 96813	1955	Unknown	
2	(1) 2-1-015:019	IMBHO020526	High Preservation Value	No	Listed	Good	Ala Moana Health Center/Department of Health Facility	State DOT-Harbors Div	591 Ala Moana Blvd, Honolulu, HI 96813	1934	Herbert Cohen Cayton, C.W. Dickey	86
2	(1) 2-1-015:030	IMBHO020610	Not Within Date Range	No	Not Applicable	Not Applicable	Foreign Trade Zone Guard Shack*	DBEDT	521 Ala Moana Boulevard, Honolulu, HI 96813	1982	Not Applicable	
2	(1) 2-1-015:030	IMBHO020803	Individually Eligible	No	A and C	Excellent	Foreign Trade Zone Pier 2 Building*	DBEDT	521 Ala Moana Boulevard Honolulu, HI 96813	1955	Unknown	79
4	(1) 2-1-015:004	IMBHO040804	Individually Eligible	No	A and C	Good	Gage Station*	U.S. Coast Guard	433 Ala Moana Blvd, Honolulu, HI 96813	1943	Unknown	105
4	(1) 2-1-015:004	IMBHO040805	Individually Eligible	No	A and C	Excellent	U.S. Coast Guard Regional Exam Center*	U.S. Coast Guard	433 Ala Moana Blvd, Honolulu, HI 96813	1938	Unknown	105
4	(1) 2-1-015:004	IMBHO040809	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 4 Small Shed*	U.S. Coast Guard		2003	Not Applicable	
6	(1) 2-1-001:059	IMBHO061038	Not Eligible	No	Lost Integrity	Excellent	Atlantis Cruises at Pier 6	State DOT-Harbors Div	1 Aloha Tower Drive Pier 6, Honolulu, HI 96813	1972	Not Applicable	
7	(1) 2-1-001:057	IMBHO071180	Not Within Date Range	No	Not Applicable	Not Applicable	Wikoliana Education Excursions	State DOT-Harbors Div		2001	Not Applicable	
7	(1) 2-1-001:057	IMBHO071186	Demolished	Not Applicable	Demolished	Not Available	Pier 7 Small Shed	State DOT-Harbors Div	Not Available	2007	Not Available	
7	(1) 2-1-001:058	IMBHO071187	Not Within Date Range	No	Not Applicable	Not Applicable	Maritime Museum	State DOT-Harbors Div	1 Aloha Tower Dr, Honolulu, HI 96813	1987	Not Applicable	
9	(1) 2-1-001:013	IMBHO091635	High Preservation Value	Yes	Listed	Excellent	Aloha Tower	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1923	Arthur L. Reynolds	125
9	(1) 2-1-001:063	IMBHO091370	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091397	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 8	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091546	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 2	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091589	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 7	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091603	Not Within Date Range	No	Not Applicable	Not Applicable	Small Shed	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	2001	Not Applicable	
9	(1) 2-1-001:063	IMBHO091606	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 4	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091609	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Ampitheatre	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091614	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 5	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091622	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 1	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091630	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 10	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091652	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 3	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
9	(1) 2-1-001:063	IMBHO091656	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Tower Marketplace Kiosk 9	State DOT-Harbors Div	1 Aloha Tower Drive, Honolulu, HI 96813	1993	Not Applicable	
10	(1) 2-1-001:001	IMBHO101750	High Preservation Value	Yes	Listed	Good	Pier 10 Shed	State DOT-Harbors Div	79 South Nimitz Hwy, Honolulu, HI 96813	1921	Unknown	125
11	(1) 2-1-001:001	IMBHO111765	High Preservation Value	Yes	Listed	Good	Pier 11 Shed	State DOT-Harbors Div	79 South Nimitz Hwy, Honolulu, HI 96813	1927	Walker & Olund Ltd.	125
11	(1) 2-1-001:005	IMBHO111850	High Preservation Value	Yes	Listed	Good	Hale Awa Ku Moku	State DOT-Harbors Div	79 South Nimitz Hwy, Honolulu, HI 96813	1950	Charles F. Wagner, Moses Akiona	125
13,/14	(1) 2-1-001:047	IMBHO132100	High Preservation Value	No	A and C	Good	Pier 13 and 14 Shed	State DOT-Harbors Div	65 North Nimitz Highway, Honolulu, HI 96817	1930	Henry Freitas	149
15	(1) 2-1-001:044	NONE	High Preservation Value	No	A and C	Good	Pier 15 Shed	State DOT-Harbors Div	111 North Nimitz Highway, Honolulu, HI 96817	1946	Unknown	161
15	(1) 2-1-001:045	NONE	High Preservation Value	No	A and C	Good	Pier 15 Fire Station	State DOT-Harbors Div	111 North Nimitz Highway, Honolulu, HI 96817	1950	Kenji Onodera	161
18	(1) 1-5-039:030	IMBHO182322	Not Eligible	No	Lost Integrity	Fair	Pier 18 Shed #2	State DOT-Harbors Div	18 North Nimitz Hwy, Honolulu, HI 96817	1951	Not Applicable	
18	(1) 1-5-039:064, 007	IMBHO182302	Not Within Date Range	No	Not Applicable	Not Applicable	Hawaii Pilot Association	State DOT-Harbors Div	18 North Nimitz Hwy, Honolulu, HI 96817	1993	Not Applicable	
18	(1) 1-5-039:065, 007	IMBHO182308	Not Within Date Range	No	Not Applicable	Not Applicable	Leo Ohai	State DOT-Harbors Div		1997	Not Applicable	
19	(1) 1-5-039:063	IMBHO192435	Individually Eligible	No	A and C	Good	Pier 19 Shed	State DOT-Harbors Div	501 North Nimitz Hwy, Honolulu, HI 96817	1924	Unknown	175
19	(1) 1-5-039:063	IMBHO192830	Not Within Date Range	No	Not Applicable	Not Applicable	Super Ferry Terminal	State DOT-Harbors Div	501 North Nimitz Hwy, Honolulu, HI 96817	2001	Not Applicable	
20	(1) 1-5-039:007, 028	IMBHO202700	Not Eligible	No	Lost Integrity	Good	Harbor's Police Training Center	State DOT-Harbors Div	19 North Nimitz Hwy, Honolulu, HI 96817	1955	Not Applicable	
21	(1) 1-5-039:034	IMBHO212795	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 21 Carpenter Shop Trailer	State DOT-Harbors Div	22 South Nimitz Hwy, Honolulu, HI 96817	2004	Not Applicable	
21	(1) 1-5-039:034	IMBHO212800	Individually Eligible	No	A and C	Fair	Pier 21 Carpenter Shop	State DOT-Harbors Div	22 North Nimitz Hwy, Honolulu, HI 96817	1946	Unknown	192
21	(1) 1-5-039:035	IMBHO212630	Individually Eligible	No	A and C	Fair	Pier 21 Machine Shop	State DOT-Harbors Div	21 North Nimitz Hwy, Honolulu, HI 96817	1951	Unknown	184

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*Properties outside of DOT-H jurisdiction

Note: Only a small portion of the Ameron Building (IMBHO609005) is within DOT-H jurisdiction. The remaining portion is situated on private property.

APPENDIX A
HONOLULU HARBOR IDENTIFICATION OF HISTORIC PROPERTIES

Pier	TMK	DOT Building_ID	Eligibility	Contributing to a Potential District	Criterion	Condition	Common_Name	Current Owner	Address	Year Constructed	Builder/Architect	Data Sheet Page No. (In Report)
23	(1) 1-5-038:005	IMBHO233005	High Preservation Value	Yes	A and C	Fair	Pier 23 Flour Mill Warehouse	State DOT-Harbors Div	557 North Nimitz Hwy, Honolulu, HI 96817	1960	Hawaiian Dredging Corporation (Contractor)	232
23	(1) 1-5-038:005	IMBHO233030	High Preservation Value	Yes	A and C	Good	Pier 23 Flour Mill Towers	State DOT-Harbors Div	557 North Nimitz Hwy, Honolulu, HI 96817	1959 - 1964	Hawaiian Dredging Corporation (Contractor)	232
23	(1) 1-5-039:015	IMBHO233010	Individually Eligible	No	A and C	Good	Pier 23 Shed	State DOT-Harbors Div	607 North Nimitz Highway, Honolulu, HI 96817	1958	Unknown	211
23	(1) 1-5-039:022	IMBHO232820	High Preservation Value	Yes	A and C	Fair	Pier 23 Flour Mill	State DOT-Harbors Div	609 North Nimitz Hwy, Honolulu, HI 96817	1964	Hawaiian Dredging Corporation (Contractor)	232
23	(1) 1-5-039:022, 026	IMBHO232809	Individually Eligible	No	A and C	Good	Warehouse 6	State DOT-Harbors Div	703 North Nimitz Highway, Honolulu, HI 96817	1928	Unknown	218
23	(1) 1-5-039:029	IMBHO232676	Individually Eligible	No	A and C	Fair	Warehouse 8	State DOT-Harbors Div	North Nimitz Highway, Honolulu, HI 96817	1928	Unknown	205
24	(1) 1-5-038:001	IMBHO243242	Not Within Date Range	No	Not Applicable	Not Applicable	Guard Shack	State DOT-Harbors Div		2007	Not Applicable	
24	(1) 1-5-038:005	IMBHO243072	High Preservation Value	Yes	A and C	Fair	Pier 24 Flour Mill Feed Shop	State DOT-Harbors Div	703 N Nimitz Hwy, Honolulu, HI 96817	1958	Unknown	232
24	(1) 1-5-038:017	IMBHO243073	Individually Eligible	No	C	Good	Administration Building	State DOT-Harbors Div	705 North Nimitz Highway, 2nd Floor, Honolulu, HI 96817	1949-1961	Unknown	226
24	(1) 1-5-039:025	IMBHO243076	Not Eligible	No	Lost Integrity	Fair	Pier 24 Shed	State DOT-Harbors Div	701 North Nimitz Highway, Honolulu, HI 96817	1957	Not Applicable	
27	(1) 1-5-038:001	IMBHO273710	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 27 Comfort Station	State DOT-Harbors Div		2001	Not Applicable	
27	(1) 1-5-038:001	IMBHO273716	Not Within Date Range	No	Not Applicable	Not Applicable	Atlantis Office Building 3	State DOT-Harbors Div		2013	Not Applicable	
27	(1) 1-5-038:001	IMBHO273718	Not Within Date Range	No	Not Applicable	Not Applicable	Atlantis Office Building 2	State DOT-Harbors Div		2013	Not Applicable	
27	(1) 1-5-038:001	IMBHO273720	Not Within Date Range	No	Not Applicable	Not Applicable	Atlantis Office Building 1	State DOT-Harbors Div		2013	Not Applicable	
27	(1) 1-5-038:001	IMBHO273724	Not Within Date Range	No	Not Applicable	Not Applicable	Atlantis Storage Facility	State DOT-Harbors Div		2013	Not Applicable	
27	(1) 1-5-038:073	IMBHO273706	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 27 Shed	State DOT-Harbors Div		2001	Not Applicable	
29	(1) 1-5-038:001	IMBHO293206	Individually Eligible	No	A and C	Fair	Oceantronics	State DOT-Harbors Div	711 North Nimitz Highway, Honolulu, HI 96817	1959	T. Takahashi Ltd.	267
29	(1) 1-5-038:001	IMBHO293252	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 29 Office	State DOT-Harbors Div		2009	Not Applicable	
29	(1) 1-5-038:001	IMBHO293652	Not Within Date Range	No	Not Applicable	Not Applicable	Women's Comfort Station	State DOT-Harbors Div		2000	Not Applicable	
29	(1) 1-5-038:001	IMBHO293657	Not Within Date Range	No	Not Applicable	Not Applicable	Men's Comfort Station	State DOT-Harbors Div		2000	Not Applicable	
30	(1) 1-5-037:001	IMBHO304180	Unable To Survey	Not Applicable	Not Available	Not Available	IES Building*	IES Downstream LLC		1954	Not Available	
30	(1) 1-5-037:002	IMBHO304181	Unable To Survey	Not Applicable	Not Available	Not Available	Aloha Petroleum Building*	Aloha Petroleum Ltd.		1946	Not Available	
30	(1) 1-5-037:002	IMBHO304185	Unable To Survey	Not Applicable	Not Available	Not Available	Aloha Petroleum Building*	Aloha Petroleum Ltd.		1951	Not Available	
30	(1) 1-5-037:002	IMBHO304183	Not Within Date Range	No	Not Applicable	Not Applicable	Aloha Petroleum Building*	Aloha Petroleum Ltd.		2006	Not Applicable	
30	(1) 1-5-037:002	IMBHO304140	Unable To Survey	Not Applicable	Not Available	Not Available	Aloha Petroleum Building*	Aloha Petroleum Ltd.		1965	Not Available	
31	(1) 1-5-035:006	IMBHO314207	Unable To Survey	Not Applicable	Not Available	Not Available	Pier 31 Building 2*	Hawaiian Electric Co Inc.	885 North Nimitz Highway, Honolulu, HI 96817	1980	Not Available	
31	(1) 1-5-035:006	IMBHO313976	Individually Eligible	No	A and C	Good	Pier 31 Building 1*	Hawaiian Electric Co Inc.	885 North Nimitz Highway, Honolulu, HI 96817	1939	Unknown	280
31	(1) 1-5-035:012	IMBHO314387	Individually Eligible	No	A and C	Good	Aala Ship Service	State DOT-Harbors Div	869 North Nimitz Highway, Honolulu, HI 96817-4517	1977	Unknown	297
31	(1) 1-5-035:033	IMBHO314313	Individually Eligible	No	C	Fair	Multiple Tenants Building	State DOT-Harbors Div	867 North Nimitz Highway, Honolulu, HI 96817	1946	Unknown	287
31	(1) 1-5-035:033	IMBHO314392	Individually Eligible	No	A and C	Good	Sea Engineering	State DOT-Harbors Div	863 North Nimitz Hwy, Honolulu, HI 96817	1954	Unknown	304
31	(1) 1-5-035:034	IMBHO314210	Demolished	Not Applicable	Demolished	Not Available	Aala Ship Service Carport and Storage	State DOT-Harbors Div	Not Available	1954	Not Available	
31	(1) 1-5-036:009	IMBHO314012	Demolished	Not Applicable	Demolished	Not Available	Pier 31-32 Shed	State DOT-Harbors Div	North Nimitz Highway, Honolulu, HI 96817	1947	Unknown	
31	(1) 1-5-036:029	IMBHO313960	Demolished	Not Applicable	Demolished	Not Available	Pier 31A Comfort Station	State DOT-Harbors Div	North Nimitz Highway, Honolulu, HI 96817	1947, 1971	Wilson Okamoto	
32	(1) 1-5-035:008	IMBHO324282	Not Within Date Range	No	Not Applicable	Not Applicable	IES Building*	IES Downstream LLC		1989	Not Applicable	
32	(1) 1-5-035:010	IMBHO324275	Individually Eligible	No	A and C	Fair	Honolulu Freight Service Building 4*	State DOT Airports Div	933 N Nimitz Hwy # A, Honolulu, HI 96817	1951	Unknown	312
32	(1) 1-5-035:010	IMBHO324276	Individually Eligible	No	A and C	Fair	Honolulu Freight Service Building 3*	State DOT Airports Div	933 N Nimitz Hwy # A, Honolulu, HI 96817	1951	Unknown	312
32	(1) 1-5-035:010	IMBHO324277	Individually Eligible	No	A and C	Fair	Honolulu Freight Service Building 2*	State DOT Airports Div	933 N Nimitz Hwy # A, Honolulu, HI 96817	1951	Unknown	312
32	(1) 1-5-035:010	IMBHO324280	Individually Eligible	No	A and C	Fair	Honolulu Freight Service Building 1*	State DOT Airports Div	933 N Nimitz Hwy # A, Honolulu, HI 96817	1951	Unknown	312
32	(1) 1-5-035:015	IMBHO324265	Not Within Date Range	No	Not Applicable	Not Applicable	JFC International, Inc.	State DOT-Harbors Div	887 North Nimitz Highway, Honolulu HI 96817-4517	1986	Not Applicable	
32	(1) 1-5-036:009	IMBHO324150	Demolished	Not Applicable	Demolished	Not Available	Pier 32 Women's Comfort Station	State DOT-Harbors Div	North Nimitz Highway, Honolulu, HI 96817	1947	Wilson Okamoto	
33	(1) 1-5-036:001	IMBHO334202	Not Within Date Range	No	Not Applicable	Not Applicable	Pier 33 Men's Comfort Station	State DOT-Harbors Div		1985	Wilson Okamoto	
35	(1) 1-5-034:004	IMBHO354402	Not Within Date Range	No	Not Applicable	Not Applicable	UH Marine Center Guard Shack	State DOT-Harbors Div		2016	Not Applicable	
35	(1) 1-5-034:004	IMBHO354460	Not Within Date Range	No	Not Applicable	Not Applicable	UH Marine Center	State DOT-Harbors Div	965 North Nimitz Highway, Honolulu, HI 96817	2014	Not Applicable	
36	(1) 1-5-034:003	IMBHO364652	Eligible Under Different Context	No	Eligible Under Different Context	Poor	Shed	State DOT-Harbors Div		1959	Unknown	
36	(1) 1-5-034:003	IMBHO364654	Not Within Date Range	No	Not Applicable	Not Applicable	Covered Work Area	State DOT-Harbors Div		1997	Not Applicable	
36	(1) 1-5-034:004	IMBHO364483	Not Within Date Range	No	Not Applicable	Not Applicable	Hart Pumping Station 1*	State DOT-Harbors Div		2001	Not Applicable	
36	(1) 1-5-034:006	IMBHO364478	Not Within Date Range	No	Not Applicable	Not Applicable	Hart Pumping Station 5*	City & County of Honolulu	1032 N Nimitz Hwy, Honolulu, HI 96817	2001	Not Applicable	
36	(1) 1-5-034:006	IMBHO364480	Not Within Date Range	No	Not Applicable	Not Applicable	Hart Pumping Station 4*	City & County of Honolulu	1031 N Nimitz Hwy, Honolulu, HI 96817	2006	Not Applicable	
36	(1) 1-5-034:006	IMBHO364481	Individually Eligible	No	A	Good	Hart Pumping Station 3*	City & County of Honolulu	1031 N Nimitz Hwy, Honolulu, HI 96817	1977	American Piping & Boiler Co.	339
36	(1) 1-5-034:006	IMBHO364482	Not Within Date Range	No	Not Applicable	Not Applicable	Hart Pumping Station 2*	City & County of Honolulu		2001	Not Applicable	
36	(1) 1-5-034-029	IMBHO364650	Not Within Date Range	No	Not Applicable	Not Applicable	Storage	State DOT-Harbors Div		1993	Not Applicable	
36	(1) 1-5-034-029	IMBHO364653	Not Within Date Range	No	Not Applicable	Not Applicable	Office, Supply and Tool Rooms	State DOT-Harbors Div		1993	Not Applicable	
38	(1) 1-5-034:004	IMBHO385162	Not Within Date Range	No	Not Applicable	Not Applicable	The Gas Company	State DOT-Harbors Div		2009	Not Applicable	
38	(1) 1-5-042:004, 001	IMBHO384816	Not Within Date Range	No	Not Applicable	Not Applicable	Hawaiian Ice	State DOT-Harbors Div	1125 North Nimitz Highway, Honolulu, HI 96817	2009	Not Applicable	
38	(1) 1-5-042:004, 001, 008	IMBHO384707	Not Within Date Range	No	Not Applicable	Not Applicable	Multi-user Building	State DOT-Harbors Div		2001	Not Applicable	
38	(1) 1-5-042:006	IMBHO384890	Not Within Date Range	No	Not Applicable	Not Applicable	Comfort Station	State DOT-Harbors Div		2001	Not Applicable	

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38	(1) 1-5-042:006	IMBHO384900	Not Within Date Range	No	Not Applicable	Not Applicable	Pacific Ocean Producers	State DOT-Harbors Div	1133 North Nimitz Highway, Honolulu, HI 96817	2004	Not Applicable	
38	(1) 1-5-042:006	IMBHO385000	Not Within Date Range	No	Not Applicable	Not Applicable	United Fishing Agency	State DOT-Harbors Div	1131 North Nimitz Highway, Honolulu, HI 96817	2006	Not Applicable	
38	(1) 1-5-042:007	IMBHO384895	Not Within Date Range	No	Not Applicable	Not Applicable	Fresh Island Fish Company	State DOT-Harbors Div	1135 North Nimitz Highway, Honolulu, HI 96817	2006	Not Applicable	
39	(1) 1-5-032:002	IMBHO395416	Not Within Date Range	No	Not Applicable	Not Applicable	Check In Station	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	2001	Not Applicable	
39	(1) 1-5-032:002	IMBHO395514	Not Within Date Range	No	Not Applicable	Not Applicable	Refrigerated Cargo (Ice House)	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1995	Not Applicable	
39	(1) 1-5-032:002, 031	IMBHO395510	Not Within Date Range	No	Not Applicable	Not Applicable	Ice House Comfort Station	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1995	Not Applicable	
39	(1) 1-5-032:026	IMBHO395500	Not Within Date Range	No	Not Applicable	Not Applicable	Electrical Room and Office	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1995	Not Applicable	
39	(1) 1-5-032:026	IMBHO395501	Not Within Date Range	No	Not Applicable	Not Applicable	Comfort Station	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1995	Not Applicable	
40	(1) 1-5-032:002	IMBHO405664	Not Within Date Range	No	Not Applicable	Not Applicable	Office Building	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1997	Not Applicable	
40	(1) 1-5-032:002	IMBHO405704	Not Within Date Range	No	Not Applicable	Not Applicable	Customer Service Building	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1997	Not Applicable	
40	(1) 1-5-032:008	IMBHO405780	Not Within Date Range	No	Not Applicable	Not Applicable	Comfort Station and Electrical Room	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1996	Not Applicable	
40	(1) 1-5-032:023	IMBHO405708	Individually Eligible	No	A and C	Good	Administration Building	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1964	Unknown	355
40	(1) 1-5-032:023	IMBHO405722	Individually Eligible	No	A and C	Good	Annex Building	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1964	Unknown	363
40	(1) 1-5-032:024	IMBHO405700	Not Within Date Range	No	Not Applicable	Not Applicable	Maintenance Building	State DOT-Harbors Div	1331 North Nimitz Highway, Honolulu HI 96817	1997	Not Applicable	
43	(1) 1-2-025:084	IMBHO427355	Individually Eligible	No	A and C	Fair	Building 904	State DOT-Harbors Div	1845 Auiki Street, Honolulu, HI 96819	1964-1965	Unknown	375
51A	(1) 1-5-041:111	IMBHO517803	Not Within Date Range	No	Not Applicable	Not Applicable	Operations Building	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1993	Not Applicable	
51 A	(1) 1-5-041:111	IMBHO517896	Individually Eligible	No	A	Good	Maintenance Building	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1975	Unknown	389
51 A	(1) 1-5-041:111	IMBHO517943	Not Within Date Range		Not Applicable	Not Applicable	Admin Building	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1990	Not Applicable	
51 A	(1) 1-5-041:111	IMBHO518000	Not Within Date Range	No	Not Applicable	Not Applicable	Gate House	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1990	Not Applicable	
51 A	(1) 1-5-041:111	IMBHO518460	Not Within Date Range	No	Not Applicable	Not Applicable	Guard House	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1997	Not Applicable	
51A	(1) 1-5-041:111	IMBHO517813	Not Within Date Range	No	Not Applicable	Not Applicable	Container Top Loader Facility	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	2008	Not Applicable	
51 B	(1) 1-5-041:111	IMBHO518465	Not Within Date Range	No	Not Applicable	Not Applicable	Auto Ramp	State DOT-Harbors Div	1601 Sand Island Parkway, Honolulu, HI 96819	1997	Not Applicable	
51 C	(1) 1-5-041:111, 181	IMBHO528054	Not Eligible	No	Lost Integrity	Fair	Matson Navigation Building	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1972	Not Applicable	
51 C	(1) 1-5-041:181	IMBHO528052	Not Eligible	No	Lost Integrity	Fair	CFS Break Room	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Not Applicable	
51 C	(1) 1-5-041:111	IMBHO528725	High Preservation Value	Yes	A	Good	Matson Gate 1 Guard House	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
51 C	(1) 1-5-041:111	IMBHO528720	Individually Eligible	No	A	Fair	Taxi Waiting Area	State DOT-Harbors Div	Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	396
51 C	(1) 1-5-041:111	IMBHO528345	Not Within Date Range	No	Not Applicable	Not Applicable	CVS Longshoremen Comfort Station	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1983	Not Applicable	
51 C	(1) 1-5-041:111, 181	IMBHO528057	Not Within Date Range	No	Not Applicable	Not Applicable	Auto Survey Station	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1997	Not Applicable	
51 C	(1) 1-5-041:111, 181	IMBHO528058	Not Within Date Range	No	Not Applicable	Not Applicable	Auto Lot Customer Service Area	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1993	Not Applicable	
52	(1) 1-5-041:200	IMBHO528794	High Preservation Value	Yes	A	Good	Container Freight Station	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528871	Individually Eligible	No	A	Fair	Reefer Shop Office	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	402
52	(1) 1-5-041:200	IMBHO528872	Not Within Date Range	No	Not Applicable	Not Applicable	Reefer Shop Tool Shed	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1994	Not Applicable	
52	(1) 1-5-041:200	IMBHO528710	High Preservation Value	Yes	A	Fair	Facilities and Maintenance Building	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528715	Not Within Date Range	No	Not Applicable	Not Applicable	CVS Machine Operators Break Room	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	2001	Not Applicable	
52	(1) 1-5-041:111	IMBHO528344	Not Within Date Range	No	Not Applicable	Not Applicable	CVS Longshoremen Break Room	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1990	Not Applicable	
52	(1) 1-5-041:200	IMBHO528912	Not Within Date Range	No	Not Applicable	Not Applicable	Fructose Facility	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1997	Not Applicable	
52	(1) 1-5-041:111	IMBHO528403	Not within Date Range	No	Not Applicable	Not Applicable	Auto Lot Guard Shack	State DOT-Harbors Div		1990	Not Applicable	
52	(1) 1-5-041:111	IMBHO528854	Not within Date Range	No	Not Applicable	Not Applicable	CVS Water Tower Operations Office	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:111, 115	IMBHO528374	Not within Date Range	No	Not Applicable	Not Applicable	MTI Security Office	State DOT-Harbors Div		2013	Not Applicable	
52	(1) 1-5-041:111, 115	IMBHO528375	High Preservation Value	Yes	A and C	Good	MTI Operations Tower	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Stanford Kuroda	409
52	(1) 1-5-041:181	IMBHO528053	Not within Date Range	No	Not Applicable	Not Applicable	VPC Book Room	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528580	High Preservation Value	Yes	A	Fair	Gate Lane 3 Inspection Area	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528582	High Preservation Value	Yes	A	Good	Gate Lane 2 Inspection Area	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528584	High Preservation Value	Yes	A	Fair	Gate Lane 1 Inspection Area	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528672	Not Eligible	No	Not Applicable	Not Applicable	Container Yard Pin Station	State DOT-Harbors Div	Sand Island Parkway, Honolulu, HI 96819	2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528680	High Preservation Value	Yes	A	Good	Gate Lane 3 Clerk Office	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528682	High Preservation Value	Yes	A	Good	Gate Lane 2 Clerk Office	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528684	High Preservation Value	Yes	A	Good	Gate Lane 1 Clerk Office	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1980	Unknown	409
52	(1) 1-5-041:200	IMBHO528706	Not within Date Range	No	Not Applicable	Not Applicable	F&M Storage Unit 1	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528707	Not within Date Range	No	Not Applicable	Not Applicable	F&M Storage Unit 2	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528708	Not within Date Range	No	Not Applicable	Not Applicable	F&M Storage Unit 3	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528709	Not within Date Range	No	Not Applicable	Not Applicable	F&M Storage Unit 4	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528711	Not within Date Range	No	Not Applicable	Not Applicable	F&M Break Room 2	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	2000	Not Applicable	
52	(1) 1-5-041:200	IMBHO528712	Not Within Date Range	No	Not Applicable	Not Applicable	F&M Break Room 1	State DOT-Harbors Div	1411 Sand Island Parkway, Honolulu, HI 96819	1990	Not Applicable	
52	(1) 1-5-041:200	IMBHO528713	Unable To Survey	Not Applicable	Not Available	Not Available	F&M Comfort Station	State DOT-Harbors Div		1980	Not Available	
52	(1) 1-5-041:200	IMBHO528714	Unable To Survey	Not Applicable	Not Available	Not Available	Matson Subcontractor Office	State DOT-Harbors Div		1980	Not Available	

LEGEND: =Eligible =High Preservation Value =Not Within Date Range =Not Eligible: Lost Integrity =Eligible: Under Different Current Context =Unable to Survey =Demolished

*Properties outside of DOT-H jurisdiction

Note: Only a small portion of the Ameron Building (IMBHO609005) is within DOT-H jurisdiction. The remaining portion is situated on private property.

APPENDIX A
HONOLULU HARBOR IDENTIFICATION OF HISTORIC PROPERTIES

Pier	TMK	DOT Building_ID	Eligibility	Contributing to a Potential District	Criterion	Condition	Common_Name	Current Owner	Address	Year Constructed	Builder/Architect	Data Sheet Page No. (In Report)
52	(1) 1-5-041:200	IMBHO528716	Not within Date Range	No	Not Applicable	Not Applicable	F&M Comfort Station	State DOT-Harbors Div	Sand Island Parkway, Honolulu, HI 96819	1990	Not Applicable	
52	(1) 1-5-041:200	IMBHO528750	Not within Date Range	No	Not Applicable	Not Applicable	Employee Security Turnstile Gate	State DOT-Harbors Div		2001	Not Applicable	
52	(1) 1-5-041:200	IMBHO528890	Unable To Survey	Not Applicable	Not Available	Not Available	MG Repair and Staging 1	State DOT-Harbors Div		1980	Not Available	
52	(1) 1-5-041:200	IMBHO528891	Unable To Survey	Not Applicable	Not Available	Not Available	MG Repair and Staging 2	State DOT-Harbors Div		1980	Not Available	
52	(1) 1-5-041:200	IMBHO528905	Not Within Date Range	No	Not Applicable	Not Applicable	Fructose Station Equipment Storage 2	State DOT-Harbors Div	Sand Island Parkway, Honolulu, HI 96819	2013	Not Applicable	
52	(1) 1-5-041:200	IMBHO528910	Not Within Date Range	No	Not Applicable	Not Applicable	Fructose Station Equipment Storage 1	State DOT-Harbors Div	Sand Island Parkway, Honolulu, HI 96819	1999	Not Applicable	
60	(1) 1-2-023:050	IMBHO609005	Eligible Under Different Context	No	Eligible Under Different Context	Good	Ameron Building	State DOT-Harbors Div	2344 Pahounui Drive, Honolulu HI 96819	1959	Unknown	
60	(1) 1-2-023:036	IMBHO609135	Demolished	Not Applicable	Demolished	Not Available	Norman's Tractor Service	State DOT-Harbors Div	Not Available	1975	Not Available	
60	(1) 1-2-023:037	IMBHO607901	Demolished	Not Applicable	Demolished	Not Available	Catamaran Multihull Design Building	State DOT-Harbors Div	50-C Sand Island Access Road, Honolulu, HI 96819	1980	Not Available	
60	(1) 1-2-023:050	IMBHO609000	Not within Date Range	No	Not Applicable	Not Applicable	Ameron Building	State DOT-Harbors Div	2344 Pahounui Drive, Honolulu HI 96819	2001	Not Applicable	
60	(1) 1-2-023:053	IMBHO607897	Not within Date Range	No	Not Applicable	Not Applicable	Hawaiian Aqua Products, Inc.	State DOT-Harbors Div		1981	Not Applicable	
60	(1) 1-2-023:057	IMBHO607898	Not within Date Range	No	Not Applicable	Not Applicable	Aloha Container Sales & Rental	State DOT-Harbors Div		1981	Not Applicable	
60	(1) 1-2-023:059	IMBHO607904	Eligible Under Different Context	No	Eligible Under Different Context	Fair	Keehi Industrial Park Association	State DOT-Harbors Div	50 E Sand Island Access Road, Honolulu, HI 96819	1980	Unknown	
60	(1) 1-2-023:064	IMBHO609150	Eligible Under Different Context	No	Eligible Under Different Context	Fair	Honolulu Recovery Systems	State DOT-Harbors Div	Pahounui Drive, Honolulu HI 96819	1961	Unknown	
60	(1) 1-2-023:064	IMBHO609152	Not Within Date Range	No	Not Applicable	Not Applicable	Honolulu Recovery Systems	State DOT-Harbors Div		1990	Not Applicable	
60	(1) 1-2-023:066	IMBHO609121	Demolished	Not Applicable	Demolished	Not Available	Erik Builders, Inc.	State DOT-Harbors Div	50-CC Sand Island Access Road, Honolulu, HI 96819	1961	Not Available	
60	(1) 1-2-023:089, 065	IMBHO609158	Eligible Under Different Context	No	Eligible Under Different Context	Fair	Friends of Hokule'a and Hawai'iloa	State DOT-Harbors Div	Pahounui Drive, Honolulu HI 96819	1961	Unknown	
60	(1) 1-2-023:093, 094, 098	IMBHO609117	Individually Eligible	No	A and C	Fair	Nanakuli Neighborhood Housing Services, Inc.	State DOT-Harbors Div	50 P Sand Island Access Rd, Honolulu, HI 96819	1961	Unknown	481
60	(1) 1-2-023:054	IMBHO607900	Demolished	Not Applicable	Demolished	Not Available	Steinke Bros., Inc.	State DOT-Harbors Div	50-C Sand Island Access Road, Honolulu, HI 96819	1980	Not Available	
60	(1)-1-2-023:076	IMBHO609154	Not Within Date Range	No	Not Applicable	Not Applicable	Ron's Concrete Specialist, Ltd.	State DOT-Harbors Div		1990	Not Applicable	
Baseyard	(1) 1-2-025:022	IMBHOBY7700	Not within Date Range	No	Not Applicable	Not Applicable	Baseyard Building	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1990	Not Applicable	
Baseyard	(1) 1-2-025:022	IMBHOBY7701	High Preservation Value	Yes	A and C	Good	Shop Building	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1971	Hogan & Chapman Architects	455
Baseyard	(1) 1-2-025:022	IMBHOBY7702	High Preservation Value	Yes	A and C	Good	Dock Building	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1971	Unknown	455
Baseyard	(1) 1-2-025:022	IMBHOBY7705	High Preservation Value	Yes	A and C	Good	Baseyard Carport	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1971	Hogan & Chapman Architects	455
Baseyard	(1) 1-2-025:022	IMBHOBY7707	High Preservation Value	Yes	A and C	Good	Baseyard Office Building	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1970	Hogan & Chapman Architects	455
Baseyard	(1) 1-2-025:022	IMBHOBY7710	High Preservation Value	Yes	A and C	Good	Material Warehouse	State DOT-Harbors Div	48 Sand Island Access Road, Honolulu, HI 96819	1968	Hogan & Chapman Architects	455

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*Properties outside of DOT-H jurisdiction

Note: Only a small portion of the Ameron Building (IMBHO609005) is within DOT-H jurisdiction. The remaining portion is situated on private property.

APPENDIX L

ECONOMIC VALUATION OF THE COMMERCIAL HARBORS SYSTEM (SMS, 2022)

Beyond Research, Intelligence.

THE VALUE OF HAWAI‘I’S COMMERCIAL HARBORS SYSTEM

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1.0 INTRODUCTION

Hawai‘i’s commercial harbors system is a crucial and invaluable asset for all residents and businesses throughout the state. As described by the Hawai‘i Department of Business, Economic Development and Tourism (DBEDT), “the marine cargo industry is an essential component of Hawai‘i’s economy. Virtually all aspects of Hawai‘i’s economy are tied to the marine cargo sector including interstate commerce, global trade and energy supply.”[1] A frequently cited statement, which usually is attributed to a 1994 study by Lee and Olive or to the Hawai‘i Department of Transportation, Harbors Division (DOTH), is often used to highlight Hawai‘i’s reliance on imported goods and the critical role the marine cargo industry and the commercial harbors system serve as Hawai‘i’s lifeline to the rest of the world. A renewed version of that statement is offered here**:** ***About 85 percent of all goods we use in Hawai‘i is imported and 91 percent of that comes through Hawai‘i's commercial harbors***.[2]

While that statement is a useful soundbite to convey the importance of the maritime industry and the commercial harbors system, the purpose of this report is to go beyond that statement to describe and quantify how the commercial harbors system and the broader maritime cargo industry in Hawai‘i contribute to the state economy through three lenses: economic activity, economic value and practical value.

Background

From early on, the Hawaiian Kingdom, with its deep-draft harbors located in the middle of the Pacific, was destined to be an important center of trade. From the first contact with the west, trade grew swiftly, and the increasing volume of international commerce contributed to the Kingdom's success and its downfall.

The capacity and the value of waterborne commerce grew steadily over the decades. Imports grew in response to consumer demand serving a rapidly expanding population, especially after statehood in 1959. At the same time tourism increased the de facto population, which contributed to an increased demand for imports. Exports initially grew in response to demand for Hawai‘i’s agricultural products and later fell off as prices ran ahead of the competition. Overall, as the demand for sugar and pineapple waned, the volume and value of imported cargo grew faster than exported cargo.

Ocean transportation provides the lowest mean cost and the most energy-efficient way of transporting cargo in and out of the state, from the U.S. continent and foreign countries to Hawai‘i’s residents and businesses. Even when air cargo began to carry some commercial goods, waterborne cargo has always been responsible for the lion's share of the load. Air transportation was never and still is not an economical or practical substitute for transporting goods except for time-sensitive cargo and high-value products.[3]

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1 “Marine Cargo & Waterborne Commerce in Hawai‘i’s Economy, Trends and Patterns in Hawai‘i Marine Cargo 2001-2016,” State of Hawai‘i Department of Business, Economic Development and Tourism, Research & Economic, Analysis Division, May 2019.

2 For more detail on the history of this statement and how it was derived, refer to the “*A Discussion on the” Value of Hawai‘i’s Harbors” Statement* in Appendix A.

3 “Marine Cargo & Waterborne Commerce in Hawai‘i’s Economy, Trends and Patterns in Hawai‘i Marine Cargo 2001-2016,” State of Hawai‘i Department of Business, Economic Development and Tourism, Research & Economic, Analysis Division, May 2019.

Waterborne cargo, on the other hand, carries different types of commodities that are less time-sensitive and more durable. Automobiles, dry bulk (iron, sand, cement, etc.), crude petroleum and other petroleum products are some examples of these commodities. However, not all waterborne cargo comes through the commercial harbors system. Crude petroleum, which represents a substantial proportion of the liquid-bulk commodities imported to Hawai‘i, requires special handling at the offshore mooring system before transferring to the refinery in Honolulu. Still, the cargo throughput of Hawai‘i’s commercial harbors system is vast and supports the demand of Hawai‘i residents and visitors from all over the world.

Into the foreseeable future, Hawai‘i’s commercial harbors will continue to provide essential transport of cargo to the residents and visitors in Hawai‘i. Therefore, maintaining an efficient commercial harbors system now and in future is vital to the well-being of Hawai‘i’s economy.

Defining the Commercial Harbors System

DOTH is responsible for administering and managing the state-owned facilities used by the commercial cargo, passenger, and fishing industries. It operates and maintains ten (10) ports in the statewide commercial harbors system, which is operated as a single integrated system for financial and management purposes. Commercial harbors include:

1. O‘ahu District: Honolulu Harbor and Kalaeloa Barbers Point Harbor
2. Maui District: Kahului Harbor and Hana Harbor[4] on Maui, Kaunakakai Harbor on Moloka‘i, and Kaumalapau Harbor on Lanai
3. Kaua‘i District: Nawiliwili Harbor and Port Allen Harbor
4. Hawai‘i (Island) District: Hilo Harbor and Kawaihae Harbor

Honolulu Harbor is the primary port-of-entry to the state and serves as the hub of the commercial harbors’ hub-and-spoke system. Cargo bound for the Neighbor Islands (interisland) are primarily transshipped from Honolulu via interisland barges. Honolulu Harbor is the primary destination for shippers, as Honolulu is the population center of Hawai‘i and shippers generally are not willing or capable of making multiple port calls. Being the most developed harbor in the system, it offers deep drafts to accommodate larger ships, and expanded services by the U.S. Customs and Border Protection, including Radiation Portal Monitoring; Hawai‘i Department of Agriculture, Plant Quarantine Branch; and other inspections and surveillance.[5]

The intent of this report is to link the port economy to the overall state economy with particular focus on Hawai‘i’s commercial harbors system. However, the data was not always available at the appropriate level. Therefore, approximations had to be made to report findings for Hawai‘i’s commercial harbors system. For clarity’s sake, these various levels are defined here.

For much of the analyses, the commercial harbors system is defined as maritime activities that deal with cargo services, passenger services, commercial fishing services, maritime support services, and DOTH.[6] Additional sectors were included in this analysis but separately reported as “Other Maritime and Harbor-Related Industries.” These sectors include truck transportation,

[4] Hana Harbor is inactive and not a functioning commercial port.

[5] “Consulting Engineer’s Report on the Operation of the Public Undertaking Period Ending Fiscal Year 2013,” State of Hawai‘i Department of Transportation, Harbors’ Division, December 2014.

[6] The classification system for Hawai‘i’s Commercial Harbors system and Broader Maritime Industry was described in an e-mail, D. Watase to F. Rex, 6/5/2020.

warehousing and storage facilities, and administrative and support services such as travel agencies and tour operations.

In other parts of this report, maritime and maritime industry are used to describe any movement of commercial cargo or activity that occurs over ocean water or in the harbor but does not include any military maritime operations such as ship repair at Pearl Harbor. Also, this study does not include any activities specifically related to small boat harbors and private marinas. Appendix B provides a more detailed account of the classification process and the specific NAICS (North American Industry Classification System) codes associated with each sector.

As noted earlier, the purpose of this report is to review and update previous links between the harbors and the state economy, and to quantify the economic value, economic activity, and practical value of the commercial harbors system. In doing so, the report will measure the dependence of Hawai‘i’s economy on the commercial harbors system

Economic Activity vs. Economic Value vs. Practical Value

Economic value is the measurement of the benefit derived from a good or service to the state of Hawai‘i — its economy and the community. Economic value represents the value that is derived from using the assets. In this case the assets are the cargo and goods that are transported by water. Economic value also looks at the willingness of the community to pay for the associated activity and the net benefits to the community. For some projects, the new net economic activity may be low, but the communities’ dependency on those activities is high; therefore, the net benefits to the local population would be high. To measure economic value, the study compared the dollar value of goods shipped by water to the value of goods shipped by air.

Economic activity is “the activity of making, providing, purchasing, or selling goods or services. Any action that involves producing, distributing, or consuming products or services is an economic activity.”[7] Gross state product is the sum of economic activity within the state.

To estimate the economic activity of the commercial harbors system, an economic impact analysis was undertaken. The analysis looked at actual expenditures, how those expenditures cycle through the state’s economy, and how that contributes to Hawai‘i’s economy. Typically, the impact is communicated as measures of economic activity — gross domestic product (GDP), sales and revenue, jobs, wages, and tax revenue. Economic impact is the best estimation at what economic activity could be lost from the local economy in the event an industry or policy were removed (i.e., a scenario if the commercial harbors system were to cease operations).

In addition to the quantitative economic activity and economic value, SMS undertook a more qualitative approach to describe the **practical value** of the state’s commercial harbors system to the residents of Hawai‘i. The purpose of this approach was to better understand how the harbors’ activities impact the day-to-day life of Hawai‘i residents.

[7] https://marketbusinessnews.com/financial-glossary/economic-activity/

2.0 ECONOMIC VALUE OF HAWAIʻI'S MARITIME CARGO

2.1 VALUE AND COMPOSITION OF MARINE CARGO

2.1.1 Approach for Value of Cargo for 2017

While the throughput of waterborne cargo can be measured in terms of tonnage and value, the value of cargo is a more meaningful and suitable metric for the purpose of this analysis. Both tonnage and value of cargo are available in the "Freight Analysis Framework 5" (FAF5). FAF5 is a database developed by the National Transportation Research Center with funding from the Bureau of Transportation Statistics (BTS) and Federal Highway Administration. The data are integrated from multiple sources such as the 2017 Commodity Flow Survey (CFS), international trade data, and some ancillary data that capture goods movement in different sectors.[8]

Besides the cargo volumes and values, FAF5 also provides the mode of transportation that captures how goods are transported from origin to destination. Specifically, there are eight modes of transportation: 1) truck, 2) rail, 3) water, 4) air (includes truck-air), 5) multiple modes and mail, 6) pipeline, 7) other and unknown, and 8) no domestic mode.

In this analysis, the waterborne cargo is mainly identified by the water mode. However, there are exceptions as described in the following paragraph. In this analysis, we also distinguish two classifications of waterborne cargo — one that enters Hawaiʻi via the commercial harbors system and one that enters Hawaiʻi via the offshore moorings. We define the former as *marine cargo* and the latter as *other maritime cargo*. The two types of cargo together make up the broader category of waterborne cargo.

The FAF5 data show that certain cargo, namely gasoline, fuel oils, and coal and other petroleum products not elsewhere classified, were transported via "pipeline" with Hawaiʻi as both the origin and destination. In practice, there is no interisland pipeline connecting Oʻahu and the neighbor islands. Therefore, it is assumed that these products are piped from the refinery in Kalaeloa to either Kalaeloa Barbers Points Harbor (KBPH) or Honolulu Harbor, where it is loaded onto a barge and shipped to the neighbor islands.[9] Once the barges arrive at the neighbor islands, the petroleum products are piped to a storage facility. Hence, these petroleum products labeled as "pipeline" mode have a significant waterborne and harbor-related component. Therefore, these petroleum products labeled as "pipeline" mode were classified as waterborne marine cargo.

The category of "no domestic mode" is limited to foreign imports of crude petroleum for which there is no domestic mode of transport, and which is transferred directly from the inbound ship to a refinery at the zone of entry. "No domestic mode" captures the majority of crude petroleum that enters Hawaiʻi via an offshore mooring. Domestic sources of crude petroleum have a transport mode of "water." Crude petroleum does not enter Hawaiʻi through the commercial harbors system and is designated as *other maritime cargo* in this analysis.

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8 Freight Analysis Framework Version 5. https://faf.ornl.gov/faf5/

9 The "pipeline" mode might also include piped petroleum products that stay on-island; however, the FAF5 data is not detailed enough to tease out that information. Therefore, for the purposes of this analysis, it was assumed that all commodities with a "pipeline" mode was attributed to the marine cargo category.

Table 1 below summarizes the definition of marine cargo that is shipped to and from the commercial harbors system. These include commodities that are only shipped by truck,[10] rail, water,[11] and multiple modes and mail[12] mode. For this report, we are interested in:

(1) Inbound cargo – cargo incoming to Hawai'i's commercial harbors system and staying in Hawai'i, regardless of its origins,

(2) Outbound cargo – cargo outgoing from Hawai'i's commercial harbors system, regardless of its final destinations, and

(3) Inter-island transshipment – cargo that moves and stays within the State of Hawai'i.

FAF5 also identifies both inbound and outbound cargo by domestic and international. Domestic inbound cargo refers to cargo destined for Hawai'i that originates from any of the other 49 states. International cargo, on the other hand, refers to cargo that originates from all other countries and whose final destination is Hawai'i. This would include International cargo destined for Hawai'i that enters the U.S. at any domestic port on the continental U.S. Outbound cargo is defined similarly, except that the origin is from Hawai'i and the destinations are either the rest of the 49 states or all other countries besides the U.S. Lastly, inter-island refers to cargo with an origin and destination of Hawai'i that move and stay within the State of Hawai'i.

All cargo that comes through Hawai'i's commercial harbors system, with a final destination outside of Hawai'i, was excluded in this analysis.

[10] Specifically, commodities transported via truck or rail mode were considered as waterborne only if they were associated with the water mode. These commodities are usually foreign imports and exports.

[11] Excluding crude petroleum.

[12] Multiple Modes and Mail or intermodal typically refers to containerized cargo that moves between ship and surface modes or truck and rail. For this analysis it was assumed that this mode is between ship and surface and was considered marine cargo (water).

Table 1: Definition of Inbound, Outbound, and Inter-island for Marine Cargo

	Mode of Transportation	Cargo Origin	Port of Entry/Exit	Destination
Inbound cargo				
Domestic	Water/Truck/Rail / Multiple modes and mail/Pipeline	Mainland US (not Hawai‘i)	N/A	Hawai‘i
International	Water/Truck/Rail / Multiple modes and mail/Pipeline	All other countries outside of U.S	Mainland US (not Hawai‘i)	Hawai‘i
International	Water/Truck/Rail / Multiple modes and mail/Pipeline	All other countries outside of U.S	Hawai‘i	Hawai‘i
Outbound cargo				
Domestic	Water/Truck/Rail / Multiple modes and mail/Pipeline	Hawai‘i	N/A	Mainland US (not Hawai‘i)
International	Water/Truck/Rail / Multiple modes and mail/Pipeline	Hawai‘i	Hawai‘i	All other countries outside of U.S
International	Water/Truck/Rail / Multiple modes and mail/Pipeline	Hawai‘i	Mainland (not Hawai‘i)	All other countries outside of U.S
Inter-island and Intra-island cargo	Water/Truck/Rail / Multiple modes and mail/Pipeline	Hawai‘i	N/A	Hawai‘i

To continue the analysis, Table 2 below shows the total value and tonnage of waterborne cargo based on the definitions and classification system from Table 1. It also shows the total value and tonnage of air cargo, which is defined as “air includes truck-air.” “Other” includes the remaining modes of transportation such as “other and unknown” and truck-only mode for cargo that originates and stays in Hawai‘i.

Table 2: Total Value and Tonnage of Cargo Shipments to, from, and within Hawai‘i, 2017

Transportation Categories		Direction	Value ($mil)	Tonnage (Thousand)	Value % Within Total Cargo	Value % Within Total Direction	Value % Within Transportation Mode
Waterborne Cargo (Marine Cargo)	Through Harbors System	Inbound	$16,976	7,286	31%	66%	60%
		Outbound	$2,433	184	4%	54%	9%
		Inter-Island	$6,716	8,112	12%	27%	24%
		Subtotal	**$26,126**	**15,582**	**48%**	**N/A**	**93%**
Waterborne Cargo (Other Maritime Cargo)	Through Offshore Mooring	Inbound	$1,997	6,206	4%	8%	7%
		Outbound	$0	0	0%	0%	0%
		Inter-Island	$0	0	0%	0%	0%
		Subtotal	**$1,997**	**6,206**	**4%**	**N/A**	**7%**
Air Cargo		Inbound	$6,419	700	12%	25%	69%
		Outbound	$2,000	42	4%	45%	22%
		Inter-Island	$846	75	2%	3%	9%
		Subtotal	**$9,264**	**817**	**17%**	**N/A**	**100%**
Other (truck only, other and unknown mode)		Inbound	$144	0	0%	1%	1%
		Outbound	$37	25	0%	1%	0%
		Inter-Island and Intra-Island	$17,104	25,331	31%	69%	99%
		Subtotal	**$17,285**	**25,356**	**32%**	**N/A**	**100%**
Total		Inbound	$25,536	14,191	47%	100%	47%
		Outbound	$4,470	251	8%	100%	8%
		Inter-Island	$24,666	33,518	45%	100%	45%
		Grand Total	**$54,672**	**47,961**	**100%**	**N/A**	**100%**

Source: Freight Analysis Framework version 5 (FAF5), U.S Department of Transportation, Bureau of Transportation Statistics. Accessed on 7/2/2021.
Note: The sum may not add up due to rounding errors.

The total value of all cargo was calculated to be $55 billion in 2017. The value of inbound marine cargo (i.e., cargo that comes through the commercial harbors system) was estimated at $16.98 billion, representing 31 percent of total cargo value and 66 percent of all inbound cargo value. The value of outbound marine cargo was $2.43 billion, representing 4 percent of total cargo value and 54 percent of total outbound cargo value. Inter-island shipments by water were valued at $6.72 billion.

Of the total value of all cargo moving through and within Hawai‘i, 48 percent ($26.13 billion) can be attributed to marine cargo, and 2 billion (4 percent) can be attributed to other maritime cargo. Together, the total value of waterborne cargo is estimated at 28.13 billion, or 51 percent of total value of all cargo in 2017. (See Table 2).

In contrast, the value of inbound air cargo in 2017 was estimated at $6.42 billion or 12 percent of total cargo value. The value of outbound air cargo was $2 billion, or 4 percent of total cargo value and inter-island shipments were valued at $846 million. Total value of air cargo accounted for just 17 percent of all cargo in 2017.

Therefore, the ***value of waterborne cargo in Hawai'i is 3.0 times greater than the value of air cargo.***

A similar statement can be made of imports and exports, excluding interisland cargo. The State of Hawai'i imports and exports over 14 million tons of cargo a year. Of that, 95 percent of cargo (tons) is transported by waterborne means. Only 5 percent of cargo is shipped by air. In dollar value, 71 percent of all cargo shipped in or out of the State by air or water can be attributed to waterborne cargo.

Note that according to Table 2, a significant share of cargo (32%) is categorized as Other cargo. Inter-island and intra-island direction cover as much as 99 percent, or $17.1 billion of the "Other" category. By cargo value, Inter-island and intra-island Other cargo consist largely of: gasoline ($4.01 billion), mixed freights ($1.47 billion), other foodstuffs ($1.35 billion), motorized vehicles ($1.09 billion), and pharmaceuticals ($817 million). The $4.01 billion worth of gasoline is transported intra-island via the truck mode. As truck mode is the major transportation means of delivering cargo on the ground after unloading from ships, the value of cargo that can be attributed to the truck mode is expected to rise as the volume of marine and air cargo increases.

The makeup of the commodities shipped by water provides insight to the dependencies of Hawai'i's economy to the commercial harbors system. Table 4 lists the top 10 goods shipped to and from Hawai'i ports (including the transshipment to and from other islands) ranked by value. The total value of the top 10 categories of goods shipped through the commercial harbors system was estimated at $19.67 billion. The total value of the top 10 goods imported to Hawai'i domestically and internationally was $12.23 billion (62%) in 2017. In contrast, $2.04 billion of goods (10%) were exported from Hawai'i to domestic and international destinations. Another $5.40 billion of top 10 goods (27%) were transported inter-island.

Crude petroleum was handled at an offshore mooring and did not go directly through the commercial harbors system. Therefore, it was separated and classified as "Other Maritime Industries." Crude oil shipments were valued at approximately $2 billion.

2.1.2 Cargo by Weight

Based on the FAF5, a total of 14,442,000 tons of cargo moved in and out of the State of Hawai'i in 2017. Of that, approximately 95 percent was shipped through waterborne means. Likewise, 95 percent of all inbound cargo (tons) was shipped through waterborne means (i.e., arrived through the commercial harbors system and the offshore mooring).

Table 3: Total Weight of Cargo Shipments to, from Hawai‘i

Categories	Direction	Tonnage (Thousand)	% of Total All Cargo
Waterborne Cargo	Inbound	13,491	94%
	Outbound	184	1%
	Subtotal	13,675	95%
Air Cargo	Inbound	700	5%
	Outbound	42	0%
	Subtotal	742	5%
Other	Inbound	0	0%
	Outbound	25	0%
	Subtotal	25	0%
All Cargo	Inbound	14,191	98%
	Outbound	251	2%
	Total	14,442	100%

Source: Freight Analysis Framework version 5 (FAF5), U.S Department of Transportation, Bureau of Transportation Statistics. Accessed on 7/2/2021.
Note: The sum may not add up due to rounding errors.

Table 4: Top 10 Categories of Goods Shipped by Water to, from, and within Hawai‘i, 2017

Commercial Harbors System

Inbound		Outbound		Inter-Island	
Categories of Goods	**Million dollars in 2017**	**Categories of Goods**	**Million dollars in 2017**	**Categories of Goods**	**Million dollars in 2017**
43-Mixed freight	$ 3,144.9	18-Fuel oils	$ 625.3	17-Gasoline	$ 2,133.8
36-Motorized vehicles	$ 2,696.6	17-Gasoline	$ 225.3	21-Pharmaceuticals	$ 946.8
40-Misc. mfg. prods.	$ 1,317.0	41-Waste/scrap	$ 217.4	18-Fuel oils	$ 498.7
35-Electronics	$ 1,073.0	07-Other foodstuffs	$ 211.3	03-Other ag prods.	$ 346.7
07-Other foodstuffs	$ 760.2	40-Misc. mfg. prods.	$ 175.9	07-Other foodstuffs	$ 296.6
17-Gasoline	$ 713.6	03-Other ag prods.	$ 130.5	36-Motorized vehicles	$ 283.3
30-Textiles/leather	$ 702.8	39-Furniture	$ 124.3	43-Mixed freight	$ 276.3
21-Pharmaceuticals	$ 667.8	35-Electronics	$ 119.0	24-Plastics/rubber	$ 237.9
23-Chemical prods.	$ 596.2	09-Tobacco prods.	$ 107.5	40-Misc. mfg. prods.	$ 234.5
39-Furniture	$ 556.5	05-Meat/seafood	$ 98.4	35-Electronics	$ 150.2
Total	**$ 12,228.6**	**Total**	**$2,035.1**	**Total**	**$5,404.9**

Source: Freight Analysis Framework version 5 (FAF5), U.S Department of Transportation, Bureau of Transportation Statistics. Accessed on 7/2/2021.
Note: The sum may not add up due to rounding errors.

Other Maritime Industries

Inbound		Outbound		Inter-Island	
Categories of Goods	**Million dollars in 2017**	**Categories of Goods**	**Million dollars in 2017**	**Categories of Goods**	**Million dollars in 2017**
16-Crude petroleum	$1,997.0	N/A	N/A	N/A	N/A
Total	**$1,997.0**	**Total**	**N/A**	**Total**	**N/A**

Source: Freight Analysis Framework version 5 (FAF5), U.S Department of Transportation, Bureau of Transportation Statistics. Accessed on 7/2/2021.

2.1.3 Trade Dependencies – Petroleum Products

Meeting the energy needs of residents and businesses is an important economic value of the cargo coming through the commercial harbors system. As an island state, fuel is imported and stored at the harbors or private property near the harbors. Refined petroleum products are also distributed throughout the islands via cargo ships. Finally, some of the refined product is also exported to other states or nations because it could not be fully consumed in Hawai‘i.

The total of all petroleum products listed in Table 4, including fuel oil, gasoline, and crude oil was valued at $6.19 billion and accounted for 29 percent of the value of the total waterborne cargo transported into, out of, and within the islands.[13] If commercial harbor services were curtailed, the state’s dependency on imported-petroleum products would bring the economy to a halt. Air transportation would be grounded due to its reliance on the import of fuel, which in turn would bring the visitor industry to a halt, one of the largest economic generators for Hawai‘i.

2.1.4 Economic Implications

If commercial harbor services were curtailed, the number and type of shipments to and from Hawai‘i would be reduced substantially (as mentioned previously, 95 percent of all imported and exported cargo by weight is waterborne cargo, Table 3). The decline in shipments would represent vastly fewer imports coming into Hawai‘i. Retailers and wholesalers would have insufficient supplies or products for consumers. When the supplies cannot keep up with the local demand, it can possibly lead to inflation in commodity prices. Even if some of the supplies can be shipped in by air, the cost of shipping would be much higher than shipping via water. All these higher costs would be passed on to consumers and reduce their purchasing power assuming their income does not rise at the same pace as the price level. In the long run, this would increase people’s cost of living and hinder economic activities due to lower disposable income, which would damage Hawai‘i’s economy.

The total value of the top 10 categories of commodities handled at Hawai‘i's commercial harbors in 2017 amounted to $19.67 billion. Excluding the $2 billion worth of crude petroleum that comes through Hawai‘i via the offshore moorings, the remaining petroleum products ($4.2 billion) such as gasoline ($3.07 billion) and fuel oils ($1.12 billion) still rank the highest of the top 10 commodities in terms of value. According to the U.S. Energy Information Administration (EIA), four-fifths of Hawai‘i’s energy consumption is petroleum and Hawai‘i consumes about 11 times more energy than it produces.[14] This means that Hawai‘i is highly dependent on imported petroleum products. Petroleum products are the sources of electricity generation and transportation. Curtailment of the commercial harbors system would result in supply shortage of petroleum. This will significantly impact not only businesses, but all industries as well as residents’ day-to-day activities in Hawai‘i.

The value of mixed freight was the second highest cargo besides petroleum products at $3.42 billion. Unfortunately, the products shipped in mixed freight containerized cargo cannot be specified and therefore difficult to evaluate their associated impact to Hawai‘i. Hence, we move forward and examine the next category of commodity with the third highest value.

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[13] This includes both the commercial harbors system and other maritime industries, The total value of waterborne cargo was $21.7 billion, Table 4.

[14] Hawai‘i State Profile and Energy Estimates. U.S. Energy Information Administration.

In 2017, the total amount of motorized vehicles cargo shipped through the commercial harbors system was estimated at $2.98 billion (15% of the top 10 values of goods). Many of these cars were imported to be used by rental car companies for visitors. Therefore, if commercial harbor services were curtailed, then the import of the passenger vehicles would decline significantly which would create a shortage of passenger vehicles that would impact both the tourism industry and retail auto industry.

The value of pharmaceuticals was also quite large; it amounted to $1.61 billion (8% of the top 10 values of goods) handled at Hawai'i's commercial harbors system. Not only do pharmaceuticals improve people's health-related quality of life, but they also contribute to Hawai'i's economy through sales and reducing the costly expenditures in public health and hospitalization. Pharmaceuticals effectively shorten the time needed for people to recover from disease or illness. When people's well-being and health are satisfactory, their work productivity increases. Therefore, the curtailment of commercial harbor services would lead to a decrease in pharmaceuticals import and create a supply shortage. That may significantly reduce people's quality of life and could result in life-threatening situations. Since productivity is linked closely with people's health, the overall work productivity will likely drop due to not having sufficient pharmaceuticals supply when needed.

The electronic commodities, on the other hand, made up $1.34 billion out of the top 10 values of goods (7%). In the era of digitalization, electronic devices such as computers, personal phones, tablets, routers, and modems, etc. have become part of our lives and essentially span across almost all industries. Without the assistance of these electronic devices, our efficiency would decline significantly, and our daily operations will likely be error prone. Hawai'i is an island state with no major industrial electronic manufacturing; most of these electronic commodities are imported from elsewhere. Therefore, if commercial harbor services were curtailed, the decline in import would create a supply shortage of electronic commodities. Industries that rely heavily on electronic commodities such as retail, wholesale, accommodation, transportation, banking, medical, and business would be impacted significantly if their demand of electronic commodities could not be met. The reduced efficiency in these industries would lead to lower productivity and profitability, which would eventually impact the rest of the industries in Hawai'i and cause a slowdown in the economy.

2.1.5 Consideration of Future Technology and Changing Consumer Behavior

The COVID-19 pandemic increased consumer dependency on e-commerce: "consumers spent $861 billion online with U.S. merchants in 2020, up an incredible 44.0 percent year over year. That's the highest annual U.S. ecommerce growth in the last two decades and triple the 15.1 percent jump in 2019."[15] An indication of the impact e-commerce is having on Hawai'i is Amazon announcing the purchase of a property adjacent to Honolulu Harbor. This may signal an increase of waterborne cargo as Amazon ships and stores large quantities of local high demand items or items to be shipped elsewhere.

According to CBRE Research, a considerable amount of warehouse space was brought online by the end of 2020 which suggests shipping and storing of even more cargo.

[15] "US ecommerce grows 44.0% in 2020," Digital Commerce 360, www.digitalcommerce360.com/article/us-ecommerce-sales/

2.2 ECONOMIC ACTIVITY

An economic analysis was conducted to estimate the net impact of all business and activities related to Hawai'i's commercial harbors system on our local economy. The purpose was to estimate the total economic impact of spending and revenues on jobs, earnings, and taxes.

In 2017, the total revenues generated by the commercial harbors system related activities accounted for $2.03 billion and funded 4,648 jobs. That level of revenue generated, in total (direct, indirect and induced), $1.17 billion in household income and earnings, supported 20,519 jobs and resulted in $324 million in state government revenue including harbor-related fees (See Table 5).

2.2.1 Approach

Ports are maritime transportation assets that facilitate economic activity by acting as gateways where transportation activities and other services facilitate the flow of imported and exported commodities. At the local or regional level, the movement of goods at the port creates employment such as when:

- truck drivers deliver or collect cargo to and from the harbor,
- dock workers and longshoreman operate cranes and machinery to load and unload vessels and manage the terminals,
- customs officials and U.S. Coast Guard personnel regulate international cargo and work with state harbor staff to ensure the security of the port,
- harbor pilots and tugboat services guide vessels through the various port waterways and access channels, and
- tour companies help the cruise ship visitors enjoy the destination.

2.2.2 Economic Impact Methodology

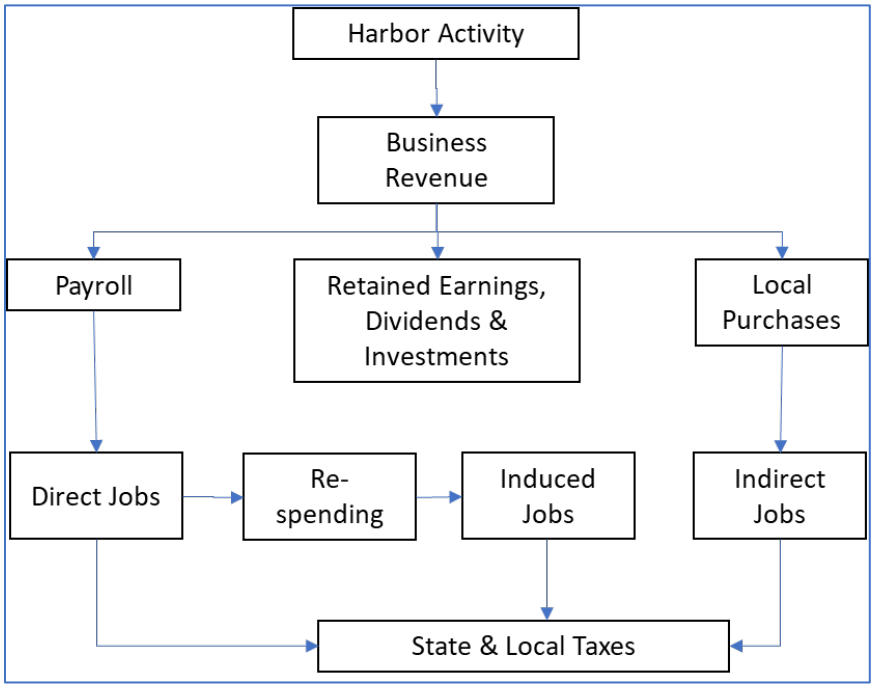
The economic impact of the commercial harbors system spending is measured in terms of its effect on jobs, earnings, and taxes. The analysis included the immediate impact of expenditures (direct) and the ripple effects (indirect and induced) of spending by harbor-related businesses on household income, state tax revenue, and jobs, throughout the local economy.

- Direct Impact: This is an estimate of the jobs and dollar amount spent in Hawai'i by companies that perform the activities of the commercial harbors system.
- Indirect jobs/earnings/taxes are created as businesses directly involved with harbors-related activities purchase goods and services in the local economy.
- Induced jobs/earnings/taxes are created as workers spend their income for goods and services.

The commercial harbors system contributes to the local and state economies by providing employment and income to individuals, tax revenues to local and state governments, and revenue to businesses engaged in handling, shipping, and receiving cargo via the port. Figure 1 illustrates the flows of economic impacts throughout the economy. Activity in the harbor[16] (i.e., the handling of cargo and the servicing of vessels) initially creates business revenue to firms providing those cargo handling and vessel services. This revenue is in turn used for several purposes:

- To hire employees to provide the services,
- To pay stockholders dividends, retire debt, and invest,
- To buy goods from other firms, and
- To pay federal, state, and local taxes.

Figure 1: Flow of a Harbor's Economic Activity through the Economy



The hiring of employees generates personal income. This personal income is spent throughout the state, and local economy to purchase goods and services. This re-spending of income is known as the multiplier effect, which in turn creates induced jobs throughout the economy. The purchases from other firms also create indirect jobs. Finally, state and local taxes are paid by those directly employed due to port activity and those employed as a result of the in-state purchases of goods and services by those individuals directly employed. As mentioned earlier, the flow of economic impacts throughout an economy will be reported as three separate and non-additive types of impacts: jobs, earnings (household income) and taxes.

[16] Economic impact measures the value of the activities (handling cargo, etc.) not the value of the actual product or cargo that is being shipped through the harbors

2.2.3 Calculation of Direct Economic Impact

The sales, value of shipments, or earnings associated with each business line were collected from the 2017 U.S. Economic Census[17] as shown in the sales, value of shipments, or revenue column in Table 5. These figures represent the direct economic activity.

2.2.4 Calculation of Total Economic Impact (Direct + Indirect + Induced)

Direct, indirect, and induced economic impacts in Hawai'i were estimated using multipliers from an economic input-output model. SMS took those model parameters from *The State of Hawai'i Input-Output Study* (DBEDT, 2012).

The associated multipliers from *The State of Hawai'i Input-Output Study* (DBEDT 2012 I-O Model, Type II multiplier) were applied to the direct activity – sales, value of shipments, or revenue. These multipliers produced the amount of direct, indirect, and induced value for earnings (household income), jobs, and state generated tax revenue.

Upon the advice of DBEDT's Research and Economic Analysis Division, the amount of Capital Improvement Project (CIP) spending was included, as this represents the government investment activity. The harbor cargo wharfage and passenger fee tariffs were added to the state-generated tax revenue to get the true revenue generated by the harbor activities.

[17] 2017 U.S. Economic Census: Sales, value of shipments, or revenue refers to all appropriate dollar volume measures including total sales, value of shipments, revenue, receipts, or business done at any time during the census year, whether or not payment was received during the census year, by domestic establishments (excluding foreign subsidiaries) within the scope of the economic census.

Table 5: Economic Impact of Harbors System Related Activities, 2017

Direct Jobs and Spending					Supported Jobs/Earnings/Tax Revenues Calculated from 2012 Hawai'i State Input-Output Model		
	NAICS	Industry	Number of Employees[1]	Sales, value of shipments, or revenue	Direct, Indirect, and Induced Jobs	Direct, Indirect, and Induced Earnings (Household Income)	Direct, Indirect, and Induced State Tax Revenue
Commercial Harbor System	921	DOTH (Administration and operations)	260	$88,452,338	1,126	$63,432,957	$6,955,013
	N/A	DOTH (CIP spending -- Govt. investment)[2]	N/A	$11,034,188[4]	106	$6,708,786	$1,302,034
	N/A	DOTH (Wharfage/Dockage fee)	N/A	N/A	N/A	N/A	$100,123,334
	N/A	DOTH (PAX fee)	N/A	N/A	N/A	N/A	$8,142,973
	114	Fishing, Hunting and Trapping	23	$53,782,284	193	$19,536,717	$3,037,963
	336	Transportation Equipment Manufacturing	922	$296,316,000	2,882	$200,678,476	$38,717,358
	483	Water transportation	1,875	$618,228,000	4,990	$302,101,112	$49,993,411
	488	Support activities for water transportation	1,126	$177,538,000	2,365	$123,929,392	$23,003,728
	445	Specialty Food Stores (fish auction)	302	$38,646,000	307	$18,446,011	$2,678,085
	487	Scenic and sightseeing transportation (water)	140	$280,964,000	3744	$196,125,324	$36,404,710
	N/A	Visitor expenditures, Cruise[3]	N/A	$463,722,173	4,805	$235,124,678	$54,128,276
Subtotal			**4,648**	**$2,028,682,982**	**20,519**	**$1,166,083,453**	**$324,486,884**
Other Maritime and Harbor Related Industries	484	Truck transportation	161	$350,748,000	4,229	$224,616,664	$43,474,575
	493	Warehousing and storage	71	$14,484,000	246	$10,818,652	$1,931,267
	561	Administrative and support services	9	$14,864,138	169	$13,320,193	$2,053,225
Subtotal			**241**	**$380,096,138**	**4,644**	**$248,755,509**	**$47,459,066**
Total			**4,889**	**$2,408,779,120**	**25,163**	**$1,414,838,962**	**$371,945,950**

[1] The employment does not cover all industry with 3-digit NAICS codes, it covers only the harbor/maritime-related industries with specific 6-digit NAICS codes.

[2] CIP Spending was calculated based on the average of four years of actual expenditures from 2015-2018, not budgeted amounts

[3] The ratio of Cruise visitor was calculated as: Cruise visitor (International + Interisland) / (Air passengers + Cruise visitor (International + Interisland)). The data were taken from the DBEDT Annual Visitor Research Report 2017.

[4] Report on Non-General Fund Information for Submittal to the 2019 Legislature. Hawai'i Department of Transportation, Harbors Division

Note: The sum may not add up due to rounding errors.

2.3 ECONOMIC IMPACT

In 2017, the total revenues generated by Hawai'i's commercial harbors system related activities accounted for $2.03 billion and funded 4,648 jobs.

That level of revenue generated, in total (direct, indirect and induced), $1.17 billion in household income and earnings, supported 20,519 jobs and resulted in $324 million in state government revenue, including harbor-related fees.

The "other maritime and harbor related industries," accounted for $380 million in revenue and 241 additional jobs. That revenue supported, in turn, 4,644 jobs, $249 million in household income and earnings, and generated $47.5 million in state tax revenue.

According to the Bureau of Economic Analysis, the state's total earnings in 2017 were $53.5 billion;[18] therefore, the commercial harbors system's contribution to earnings was 2.2 percent. In 2017, the state's total job count (payroll, civilian and self-employed) was 920,376,[19] and activity of the commercial harbors system supported 2.2 percent of the total job count. In addition, the "other maritime and harbor related industries" supported another 4,644 jobs or 0.5 percent of all jobs in the state and contributed another $47.5 million to state government revenue.

Altogether, the economic impact of the overall maritime industry (commercial harbors system and the other related industries) in Hawai'i, contributed $372 million to the state tax base. By comparison, Hawai'i's top industry, tourism, contributed $1.76 billion in state taxes in 2017.[20]

2.3.1 Impact from the Transportation Sectors

The largest contribution from an activity in the commercial harbors system was water transportation, which included: deep sea water transportation and deep-sea freight transportation. This activity accounted for $618 million in sales revenue. Another $178 million in revenue came from support activities for water transportation. All together water transportation accounted for $796 million in revenue, supported 7,356 total jobs, and generated $426 million in household income and $73 million in state tax revenue.

A portion of water-based activity is related to petroleum bulk items including jet fuel, diesel, gasoline, and fuel oil, etc. Also, crude oil, used to make refined petroleum products, is shipped to Hawai'i but handled at private offshore moorings. The refined product passes through pipelines to be distributed at Kalaeloa Barbers Point Harbor and Honolulu Harbor. Only a portion of the refined product is handled in the commercial harbors system; however, those figures could not be separated from the reports of total production.[21] Due to the lack of accurate data, handling of petroleum products was excluded from this economic impact analysis. The actual shipping of petroleum products, such as shipping jet fuel to the neighbor islands, would still be covered in the revenue generated by the water transportation companies already included in the economic impact model.

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[18] 2017 Bureau of Economic Analysis, Hawai'i State Total Earnings

[19] According to Eugene Tian, Hawai'i State Economist, "In our I-O model, we used BEA job numbers so that the job count calculated using the I-O job multipliers include self-employed. Whenever I-O multipliers are used, BEA jobs should be used." 2017 Bureau of Economic Analysis, table SAEMP25N Total Full-Time and Part-Time Employment by NAICS Industry

[20] Economic Activity Generated by Visitor-Related Expenditures, Table 7.31. 2020 DBEDT Databook.

[21] PAR Hawai'i Refining, LLC considers this information confidential.

2.3.2 Impact from the Hawai‘i State Government (DOT)

The Hawai‘i state government played a large role in the activities related to the commercial harbors system. In terms of direct spending, the state contributed $88.5 million through Administration and Operations. The state also contributed $11 million in CIP spending which would be considered a government investment.[22] The total spending by the state government was $99 million. This spending on harbor activities then generated directly, indirectly and induced, $70 million in earnings and supported 1,232 jobs. The spending also generated $8 million in state tax revenue. The state government also contributed to the state tax revenue through the assessment of wharfage, dockage fees and cruise passenger fees. In 2017, the tariffs added another $108 million to the state tax revenue collection. Therefore the $117 million in state tax revenue, from DOTH administration, CIP spending and tariffs/fees collected, was equivalent to 36 percent of the state tax revenue generated by the commercial harbor system.

2.3.3 Impact from the Visitor Industry

In 2017, 255,846 visitors were passengers on interisland and trans-pacific cruise ships that sailed the Hawaiian waters and berthed at state piers. These cruise passengers stayed in Hawai‘i an average of 7.63 days, accounting for 1.95 million visitor days. Those passengers had a direct visitor expenditure of $464 million dollars while in Hawai‘i waters.[23] That spending in Hawai‘i generated $235 million in earnings (household income) and supported 4,805 jobs. The cruise industry contributed $54 million in state tax revenue (direct, indirect and induced).

[22] The CIP spending was calculated as a 4-year average to reduce volatility from any given year. The CIP spending was initially budgeted for $30 million annually, but the actual amounts spent were lower than the cap.

[23] Annual Visitor Research Report 2017, Hawai‘i Tourism Authority, 2017.

3.0 THE BROADER VALUE OF THE HARBORS

In addition to the quantitative economic activity and economic value, SMS undertook a more qualitative approach to describe the value of the commercial harbors system to the residents of Hawai‘i. The purpose of this approach was to better understand how just one of the harbors' activities impacts Hawai‘i residents.

3.1 APPROACH

SMS conducted interviews with managers of food stores (small, one-location stores; chain stores; and big box stores) around the state. Surveys representing 53 stores overall were completed.[24] At least one store per island was included in the survey.

For purposes of this survey, the term "off-island" was used to differentiate between food or products that were grown or manufactured "on-island," versus imported to each island via water or air transport (off-island). Off-island may include products that came from domestic or foreign markets through Honolulu Harbor and includes produce or goods that move between the islands.

Note that in determining how long supplies would last, all stores assumed a normal purchase pattern, not panic-type buying. Interviews were conducted in late January and early February 2020.

3.2 RESULTS

On average, 85 percent of the food sold through these stores is from off-island (domestic or international imports, as well as from other islands). Of these food products, 82 percent arrive on the island via water: waterborne imports from outside the state arrive at Honolulu Harbor where most of the food stays on O‘ahu, and a lesser percent is shipped via barges to other islands. This means that **on average 70 percent (0.85 * 0.82) of all food sold through these markets are brought in through at least one harbor**.

Stores estimate that an average of 18 percent of food brought in from off-island arrives via air cargo shipments. Overall air cargo tends to be smaller, lighter goods, that need to be delivered faster and are more valuable. Air transportation was the option most mentioned in terms of plans in place should the harbors not be available, but the higher cost of transport would no doubt be passed on to the consumer. It should be noted that only half of the respondents knew that their store had plans should they not be able to receive goods through the harbor.

[24] Nine surveys representing 53 stores were completed. The range of responses were very consistent, and the "outliers" were primarily due to different sizes of stores. Significantly more stores were contacted; however, they declined to participate because of not wanting to share confidential information, or not being able to reach a person who could report on deliveries and product availability.

Table 6: Summary of Food Supply Survey Results

Survey of Markets Throughout the State	Average
% of food sold brought in from off-island	85%
% of food brought in from off-island that arrives via the harbor(s).	82%
% of non-food items sold that are brought in from off-island	91%
% of non-food items brought in from off-island that arrives via the harbor(s).	87%
Frequency of shipments through the harbor(s)	3.56 time per week
If deliveries through the harbor were stopped, how many weeks before your food supplies would be severely diminished?	1.7 weeks
If deliveries through the harbor were stopped, how many weeks before your non-food supplies would be severely diminished?	1.8 weeks

On average 91 percent of non-food items sold through these stores arrive from off-island. Of these items, on average 87 percent move through at least one state harbor. This means on average about 79 percent (0.91 * 0.87) of non-food items sold through these markets are brought in through at least one state harbor.

On average these stores receive deliveries via a harbor 3.6 times per week. If deliveries were to stop for whatever reason, these market managers estimate their food supply would be severely diminished in a week and a half, and their non-food items in around two weeks.

There are differences between Oʻahu stores and stores on the other islands. Oʻahu stores receive deliveries more often than the other islands. Smaller islands like Lānaʻi receive only one delivery a week and Molokaʻi receives two deliveries a week – in both cases, deliveries depend on whether barges are able dock safely due to weather conditions.[25]

Are these estimates reasonable? The average availability for food products makes sense because perishables have a given "life," and non-perishables last longer. In addition, few stores in Hawaiʻi have the warehouse space needed to maintain large quantities of goods, and the cost of warehousing would be significant. Like most businesses, food stores have come to rely on "just in time" deliveries and this is supported by the frequency of deliveries.

A higher estimate of food consumption and supply comes from the paper "Hawaiʻi's food consumption and supply sources: benchmark estimates and measurement issues."[26] That study estimates "that only 11.6 percent of available food for consumption in Hawaiʻi was actually sourced from local production in the state. Likewise, an estimated 88.4 percent of available food was sourced from imports out of the state."

[25] Averages by location and type of store shown in Appendix D, page 35.

[26] "Hawaiʻi's food consumption and supply sources: benchmark estimates and measurement issues," Matthew K. Loke and Ping-Sun Leung, Loke and Leung *Agricultural and Food Economics* 2013.

3.3 PRACTICAL VALUE

Hawai‘i residents are very dependent on the state’s commercial harbors system operating reliably and efficiently:

> *Approximately 70 percent of food sold through Hawai‘i food markets is brought in through at least one state harbor(s). If harbor deliveries were stopped, food markets estimate that within one and a half weeks their food supply available for purchase would be severely diminished.*
>
> *About 79 percent of non-food items sold through food markets moves through state harbor(s). If harbor deliveries were stopped, food markets estimate, on average, that in less than two weeks, their non-food items supply available for purchase would be severely diminished.*

For this discussion, only food and other items sold through food markets were included. We recognize as noted earlier in the report that goods brought in for businesses or items not sold in grocery stores, such as cars and most building supplies also come through the commercial harbors system. The 2021 shipping slowdown/backlog at ports on the continent, have resulted in shortages of appliances here in Hawai‘i. These are just examples of the practical value of harbors to Hawai‘i residents.

4.0 CONCLUDING REMARKS

The harbors play an essential role in meeting the needs of Hawai‘i residents and businesses. The State of Hawai‘i imports and exports over 14 million tons of cargo a year. Approximately 95 percent of imports is associated with waterborne cargo. Excluding crude oil,[27] approximately 91 percent of goods is imported and exported through the commercial harbors system; only 9 percent of cargo is shipped by air. Respectively, in dollar value, 69 percent of that cargo can be attributed to marine cargo.

The commercial harbors system is also a crucial contributor to Hawai‘i’s economy. The revenue from businesses in the harbor generate $1.17 billion in household income and earnings, supports 20,519 jobs and generates $324 million in state government revenue including harbor-related fees. Hawai‘i also has a strong dependency on the commercial harbors system. If harbor deliveries were stopped, food markets estimate that within one and a-half weeks their food supply available for purchase would be severely diminished and in less than two weeks, their non-food items supply available for purchase would be severely diminished.

[27] Crude oil enters Hawaii through an offshore mooring and does not pass through the commercial harbors system. Therefore, crude oil was excluded from the total amount of goods used to calculate the relative percentage of goods imported and exported by air or through the harbors system in terms of tonnage and dollar value.

APPENDIX A

A DISCUSSION ON THE "VALUE OF HAWAIʻI'S HARBORS" STATEMENT

A much-quoted statement, said to derive from a 1994 report by Lee and Olive[28] is often used to emphasize the importance of Hawaiʻi's harbors to the state's economy. One of the objectives of this current study is to update that statement; it has been challenging. The statement has been made using slightly different words over the years, but it usually appears in the following format:

> "About 80 percent of all goods consumed in Hawaiʻi are imported, and 98.6 percent of the imported goods arrive by sea.

For ease of presentation, SMS will refer to this as the "harbors statement."

The harbors statement appears in a long list of writings since 1997. The statement appeared in a presentation to the U.S. Congress in 1999, a recent presentation to the Association of Pacific Ports, and articles covering fields as diverse as alien species control, economic sustainability, and the COVID-19 Pandemic. However, over the years the phrase "by sea" and "through the harbors system," or something similar, has been used interchangeably and become conflated. It appears as written above in the 1997 *Oʻahu Commercial Harbors 2020 Master Plan*. In 2011, the harbors statement appears on page 1 of the *Hawaiʻi Island Commercial Harbors 2035 Master Plan Update* but uses "commercial harbors system" instead of "by sea." It now appears in this format in Harbors Division's media materials.[29]

Authors of those publications often present the statement without attribution, and when they provide a citation, the cited document may also have presented it without attribution. There are cases in which an author will support the statement by adding anecdotally that they know there are industries in which Hawaiʻi produces none of a product. They usually mention raw materials (petroleum products, coal), building products (steel, lumber) and manufactured goods (automobiles, aircraft, etc.). In some cases, these industries with all or nearly all imports are presented in place of the harbors statement.

Nearly always, the statement appears as a single sentence or two. It is not analyzed or criticized, examined, or expanded upon.

Where the harbor's statement is properly cited, it is nearly always attributed the Hawaiʻi DOT Harbors Division. Only rarely do we find a citation to other documents and those are limited to Lee and Olive, or Leroy Laney[30] citing Lee and Olive. Picking up this issue in 2014, Harbors Division worked on the problem in-house[31] and asked the *Honolulu Harbors 2050 Master Plan*

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[28] Lee, Donna J., and Cristina A. Olive. 1994. Size and Growth of Hawaiʻi's Maritime Industry, University of Hawaiʻi at Manoa, Department of Agriculture and Resource Economics and Sea Grant College Program, June 1994.

[29] Port Hawaiʻi: Our Commercial Harbor System, DOTH Harbors Division Media Kit, 2018, p. 1.

[30] Leroy O. Laney. 2007. The Impact of Hawaiʻi's Harbors on the Local Economy, prepared for the Hawaiʻi Harbors Users Group, May 2007.

[31] "Breakdown of incoming overseas cargo to Hawaiʻi by sea versus air: An update to the statistic published in Lee and Olive (1994). An unpublished report prepared by State of Hawaiʻi Department of Transportation Harbor Division, Planning Section, 2014.

project team to update the statement as well. As part of the literature search to support this effort, SMS investigated the antecedents of the harbors statement as it appears in Lee and Olive.

The title of Lee and Olive's 1994 study was *Size and Growth of Hawai'i's Maritime Industry.* The purpose of the report was to estimate the size, the growth, and the growth rate of the Hawai'i Maritime Industry as they defined it. They did not set out to estimate the percent of goods imported or the percent imported through harbors.

Lee and Olive did make a statement about imports. They wrote,

> "…Nearly all the food, building materials, manufactured goods, and energy products used in the islands are imported. Of the imported goods, 1.4 percent arrive by air and 98.6 percent are shipped by sea."

It appears on the first page of the report and in the first paragraph of the executive summary. It is presented as a justification for their research, not as one of its conclusions. In 2014, Harbors Division contacted Donna J. Lee, one of the authors of the report, and queried her on the origin of that statement.[32] Ms. Lee said that she could not recall the data on which the percentages were based, nor could she recall the method by which they were calculated.

Harbors Division concluded that Lee and Olive must have had access to some dataset to calculate the percentages in the opening statement to their report.[33] An alternate possibility is that Lee and Olive may have picked up the format of the harbors statement at the University. They were economics graduate students at the University of Hawai'i at Manoa and attached to the Department of Agriculture and Resource Economics. They would likely have taken economics courses from professors in Ag Econ and Economics. As we will see below, this may have connected them to earlier versions of the harbors statement.

Origins

The general idea behind the harbors statement was known in Hawai'i for decades before Lee and Olive published. The earliest published version we found was from Thrum's Annual in 1881,[34] where Thrum wrote, "we import nearly everything that we eat, drink, wear, or use, and San Francisco is our principal source of supply. We are producers and exporters of sugar, rice, and a few other minor articles, but importers of all else." That article was identified for us by Professor James Mak, Professor of Economics at the University of Hawai'i at Manoa. We spoke with Dr. Mak after finding our own first occurrence and the harbors statement in his 1977 publication.[35] On page 1, the authors state, "Approximately 80 percent of all the goods purchased in Hawai'i are imported from outside the state. Hawai'i's people pay for these, as well as a myriad of service imports, largely by selling (exporting) goods and services to persons, governments, and businesses outside the state." They cited Thrum (1881, p.63). The statement was introductory to their report and not a research finding.

Dr. Mak also told us that he believes the source of that statement is research conducted by First Hawaiian Bank (FHB) economist Thomas Hitch. As Dr. Mak put it, "Tom Hitch once laboriously

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32 Ibid., p.4.
33 Ibid., p.5.
34 Thomas Thrum. 1881. Thrum's Hawai'i an Almanac and Annual: A handbook of valuable and statistical information relating to the Hawai'i an Islands, Published by: Thrum and Oat, 1877-78, by Thomas Thrum, 1879-1924, p. 63.
35 In Ebel R., Mak J., Moncour J. (1977) The future of Hawai'i's major exports. in Ghali M. (ed) Tourism and regional growth. Studies in applied regional science, vol 11. Springer, Boston, MA.

put that estimate together (at one time I knew what method was employed), and it has been the figure used forever. (That's) how a number sometimes becomes folklore, sometimes (even) when it is incorrect."[36] Hitch had many publications between 1960 and 1977 that might include reference to the study Jim Mak mentioned. Most are out of print. Based on our research, we believe Dr. Mak may have been referring to a report published in 1973.[37] We have not been able to locate a copy of that document. Hitch refers to this article in his book,[38] *Islands in Transition*, suggesting that it may be the source of the research to which Dr. Mak referred.

Hitch's method may have been described in the 1973 FHB report, but Dr. Mak could not recall the details. Paul Brewbaker, Chief Statistician for Bank of Hawai'i at the time, reported that he remembers such a report but not the method used. He said that both banks did that sort of research periodically, relying on data provided by Matson Navigation Company.[39]

Lee and Olive were at the University of Hawai'i in the years between Ebel, Mak, and Moncour's 1977 article and Hitch's work at FHB. Certainly, they would be familiar with the basic form of the harbors statement. Their use of the statement was introductory, and not a result of their research. No large dataset, mass data collection, or analysis would have been required. Rather, they could have been part of that process by which "a number becomes folklore" as Dr. Mak described it.

Even if we were to locate a copy of Dr. Hitch's method, it may not be possible to reproduce it. The type of data used for imports research at the time are no longer available and reproducing them in the field would be difficult and expensive.

Issues

DOTH's unpublished white paper[40] provides 35 pages of detail on definitions and data issues involved in updating the harbors statement. At the end, it calculated an estimate of the percent of total imports that arrive in Hawai'i via the harbors (98%), which was about the same as the number presented by Lee and Olive. The report did not estimate the percent of total consumption that was imported (i.e., the 80% in the harbors statement). Our own research findings agree with the DOTH report and serve as further testament to the many difficulties presented by data and data definitions.

Our research suggests that the major barrier to updating the harbors statement is the first statistic. There are several reasons for that. First, the statistic is described in different ways. We have seen "80% of everything we use in Hawai'i," "80% of everything we buy in Hawai'i" and other minor deviations in wording. Some authors list specific products or services, like Lee and Olive, Ebel, Mak and Moncour, and Leroy Laney.

Second, and more important, there are no agreed-upon definitions of "everything we use in Hawai'i." Do we mean all the goods we use, all the services we use, or both? With respect to goods, do we mean consumer goods, or producer goods, or both? Do we measure in terms of volume (tons?) or value (dollars)? These issues are not addressed in the literature. Even if we were to

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36 Mak, James personal communication with J. Dannemiller, February 6, 2018.

37 Hitch, Thomas. Hawai'i, the most vulnerable state in the nation. Research Division, First Hawaiian Bank, P.O. Box 3200, Honolulu, Hawai'i 96801. March 1973. 40p.

38 Hitch, Thomas Kemper. 1992. Islands in Transition: The Past, Present, and Future of Hawai'i's Economy, Honolulu: First Hawaiian Bank, 1992.

39 Brewbaker, Paul personal communication with J. Dannemiller.

40 "Breakdown of incoming overseas cargo to Hawai'i by sea versus air: An update to the statistic published in Lee and Olive (1994). An unpublished report prepared by State of Hawai'i Department of Transportation Harbor Division, Planning Section, 2014.

solve those issues, we would then have to find a data source that would provide the detail needed to match our definition.

Choosing a dataset is complicated because the selected dataset must include both the numerator and the denominator for the statistic. For example, if we were to choose "all consumer goods consumed in Hawai'i (by volume[41])," we could use Bureau of Economic Analysis (BEA) consumer expenditure data as reported by the Federal Reserve Economic Data (FRED) to find the total goods used in Hawai'i for succeeding years (the denominator). But the data for the numerator, "the volume of all consumer goods imported to Hawai'i through the harbors system" are not available in that dataset. Nor can we find that data in Hawai'i. Since the introduction of container shipping, we can no longer identify whether a shipment contains consumer or producer goods.

The problem is even more complicated if imported services are considered along with producer and consumer goods in the definition of "everything we use in Hawai'i." Increasing amounts of services are available through the Internet, making their volume and value impossible to measure. In this case, the value of imported services may not be available for use as numerator or denominator.

In the end, our research on the harbors statement shows it has been used many times in many formats for many years. It has been a useful tool for explaining the value of Hawai'i's harbors to our economy. However, uncovering the methodology for deriving that statistic (and statement) proved unsuccessful and thus could not be replicated for this study.

The Path Forward

In order to update the harbors statement, a new approach had to be undertaken. The Freight Analysis Framework 5 (FAF5) dataset, which "integrates data from various sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation" (https://faf.ornl.gov/faf5/) seemed to be the most suitable and readily available data source from which to generate an updated harbor statement. The FAF5 dataset accounts for all commodities transported (i.e., both consumer and producer goods) and enables analysis by commodity type and mode of transportation.

According to the FAF5 data, total waterborne cargo (through the commercial harbors system and through the offshore mooring) that entered Hawai'i represents 95 percent of all inbound cargo, with air cargo representing the other 5 percent (refer to Table 3 in Section 2.1.1 of the report).

However, crude petroleum comprises a significant proportion of waterborne commodities imported to Hawai'i. By tonnage, it represents about 46 percent of waterborne cargo imported to Hawai'i - 6,206 thousand tons of the total 14,191 thousand tons. Therefore, for the purposes of this analysis, crude petroleum, which enters Hawai'i via the offshore moorings (i.e., does not pass through the harbors system), is set aside to focus on the relative proportion of goods imported through the harbors system versus the airports system. Discounting crude petroleum, the total volume of inbound cargo was 7,986 thousand tons (14,191 thousand tons – 6,206 thousand tons). The 7,286 thousand tons of cargo that entered Hawai'i through the commercial harbors system represents 91 percent of inbound cargo, with air cargo representing 9 percent. (If accounting for

[41] Volume can be estimated by using conversion factors developed from FAF5 data.

crude petroleum, inbound cargo that enters Hawai‘i through commercial harbors system would then only be 51 percent of total inbound cargo and air cargo would be 5 percent).

Various sources note that Hawai‘i imports anywhere from 85 to as high as 92 percent of its food—Loke and Leung[42] (2013) estimated 88.4 percent and according to Kent[43] (2014), a 2012 legislative bill citing the USDA stated that Hawai‘i imports 92 percent of its food, Kent also noted that most analysts agree that 85 percent or more of Hawai‘i’s food is imported. Food is one the few things that Hawai‘i can produce locally, in its entirety, from fruits and vegetables, to milk, eggs and meat. However, what food Hawai‘i does produce locally represents but a small percentage of the total food consumed.

Conclusion

The commercial harbors system is important to the local economy even beyond the value of freight it accommodates and the implication that Hawai‘i’s harbors are especially crucial to the state’s economic wellbeing. DOTH is frequently asked to provide support for that assertion and the harbors statement has been useful in explaining the importance of the harbors system.

Given that the methodology and data underlying the original harbor’s statement cannot be found, SMS proposes a conservative approach of relying on numbers that have a statistical foundation and for which there is general agreement. As discussed above, for the percent of *goods we use*, we rely on the previous estimates of food that is imported into the state as a surrogate. For the percent of *what is shipped through the harbor* compared to what comes by air, we rely on the estimate of 91 percent. Earlier iterations of the statement, such as the often-cited Olive and Lee statement, may have included total waterborne imports that “arrive by sea,” but for this statement we focus only on what comes through the harbors system.[44] The statement then reads:

> *About 85 percent of all goods we use in Hawai‘i is imported, and 91 percent of that is shipped through Hawai‘i’s commercial harbors system.*

[42] “Hawai‘i’s food consumption and supply sources: benchmark estimates and measurement issues,” Matthew K. Loke and Ping-Sun Leung, Loke and Leung *Agricultural and Food Economics* 2013.

[43] Kent, George. “Food Security in Hawai‘i.” In Jennifer Chirico and Gregory S. Farley, eds., Thinking Like an Island: Navigating a Sustainable Future in Hawai'i. Honolulu: University of Hawai‘i Press, 2015.

[44] Goods, with the exception of crude oil, which is shipped to Hawaii by sea but does not pass through the commercial harbors system.

APPENDIX B

DEFINITION OF HARBOR ACTIVITIES USED IN THE ECONOMIC IMPACT ANALYSIS

This report used the following NAICS codes related to the harbor activities. The definitions are taken from the U.S. Census Bureau North American Industry Classification System 2017.

114 Fishing
This industry comprises establishments primarily engaged in the commercial catching or taking of finfish, shellfish, or miscellaneous marine products from a natural habitat, such as the catching of bluefish, eels, salmon, tuna, clams, crabs, lobsters, mussels, oysters, shrimp, frogs, sea urchins, and turtles.

> **114111 Finfish Fishing**
> This U.S. industry comprises establishments primarily engaged in the commercial catching or taking of finfish (e.g., bluefish, salmon, trout, tuna) from their natural habitat.

336 Ship and Boat Building
This industry comprises establishments primarily engaged in operating shipyards or boat yards (i.e., ship or boat manufacturing facilities). Shipyards are fixed facilities with drydocks and fabrication equipment capable of building a ship, defined as watercraft typically suitable or intended for other than personal or recreational use. Boats are defined as watercraft typically suitable or intended for personal use. Activities of shipyards include the construction of ships, their repair, conversion and alteration, production of prefabricated ship and barge sections, and specialized services, such as ship scaling.

> **336611 Ship Building and Repairing**
> This U.S. industry comprises establishments primarily engaged in operating shipyards. Shipyards are fixed facilities with drydocks and fabrication equipment capable of building a ship, defined as watercraft typically suitable or intended for other than personal or recreational use. Activities of shipyards include the construction of ships, their repair, conversion and alteration, the production of prefabricated ship and barge sections, and specialized services, such as ship scaling.

483 Water Transportation
Industries in the Water Transportation subsector provide water transportation of passengers and cargo using watercraft, such as ships, barges, and boats.

> **483111 Deep Sea Freight Transportation**
> This U.S. industry comprises establishments primarily engaged in providing deep sea transportation of cargo to or from foreign ports.

> **483113 Coastal and Great Lakes Freight Transportation**
> This U.S. industry comprises establishments primarily engaged in providing water transportation of cargo in coastal waters, on the Great Lakes System, or deep seas between ports of the United States, Puerto Rico, and United States island possessions or protectorates. Marine transportation establishments using the facilities of the St. Lawrence Seaway Authority Commission are considered to be using the Great Lakes Water

Transportation System. Establishments primarily engaged in providing coastal and/or Great Lakes barge transportation services are included in this industry.

4883 Support Activities for Water Transportation
This industry group comprises establishments primarily engaged in one of the following: (1) operating ports, harbors (including docking and pier facilities), or canals; (2) providing stevedoring and other marine cargo handling services (except warehousing); (3) providing navigational services to shipping; or (4) providing other services to water transportation.

488320 Marine Cargo Handling
This industry comprises establishments primarily engaged in providing stevedoring and other marine cargo handling services (except warehousing).

488330 Navigational Services to Shipping
This industry comprises establishments primarily engaged in providing navigational services to shipping. Marine salvage establishments are included in this industry.

488390 Other Support Activities for Water Transportation

This industry comprises establishments primarily engaged in providing services to water transportation (except port and harbor operations; marine cargo handling services; and navigational services to shipping).

4452 Specialty Food Stores
This industry group comprises establishments primarily engaged in retailing specialized lines of food.

445220 Fish and Seafood Markets
This industry comprises establishments primarily engaged in retailing fresh, frozen, or cured fish and seafood products.

4841 General Freight Trucking
This industry group comprises establishments primarily engaged in providing general freight trucking. General freight trucking establishments handle a wide variety of commodities, generally palletized, and transported in a container or van trailer. The establishments of this industry group provide a combination of the following network activities: local pick-up, local sorting and terminal operations, line-haul, destination sorting and terminal operations, and local delivery.

484110 General Freight Trucking, Local
This industry comprises establishments primarily engaged in providing local general freight trucking. General freight trucking establishments handle a wide variety of commodities, generally palletized and transported in a container or van trailer. Local general freight trucking establishments usually provide trucking within a metropolitan area which may cross state lines. Generally, the trips are same-day return.

484121 General Freight Trucking, Long-Distance, Truckload
This U.S. industry comprises establishments primarily engaged in providing long-distance general freight truckload (TL) trucking. These long-distance general freight truckload carrier establishments provide full truck movement of freight from origin to destination. The shipment of freight on a truck is characterized as a full single load not combined with other shipments.

484122 General Freight Trucking, Long-Distance, Less Than Truckload
This U.S. industry comprises establishments primarily engaged in providing long-distance, general freight, less than truckload (LTL) trucking. LTL carriage is characterized as multiple shipments combined onto a single truck for multiple deliveries within a network. These establishments are generally characterized by the following network activities: local pick-up, local sorting and terminal operations, line-haul, destination sorting and terminal operations, and local delivery.

484220 Specialized Freight (except Used Goods) Trucking, Local
This industry comprises establishments primarily engaged in providing local, specialized trucking. Local trucking establishments provide trucking within a metropolitan area that may cross state lines. Generally, the trips are same day return.

484230 Specialized Freight (except Used Goods) Trucking, Long-Distance
This industry comprises establishments primarily engaged in providing long-distance specialized trucking.

488510 Freight Transportation Arrangement
This industry comprises establishments primarily engaged in arranging transportation of freight between shippers and carriers. These establishments are usually known as freight forwarders, marine shipping agents, or customs brokers and offer a combination of services spanning transportation modes.

493 Warehousing and Storage
Industries in the Warehousing and Storage subsector are primarily engaged in operating warehousing and storage facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle. These establishments take responsibility for storing the goods and keeping them secure. They may also provide a range of services, often referred to as logistics services, related to the distribution of goods. Logistics services can include labeling, breaking bulk, inventory control and management, light assembly, order entry and fulfillment, packaging, pick and pack, price marking and ticketing, and transportation arrangement. However, establishments in this industry group always provide warehousing or storage services in addition to any logistic services.

493110 General Warehousing and Storage
This industry comprises establishments primarily engaged in operating merchandise warehousing and storage facilities. These establishments generally handle goods in containers, such as boxes, barrels, and/or drums, using equipment, such as forklifts, pallets, and racks. They are not specialized in handling bulk products of any particular type, size, or quantity of goods or products.

493120 Refrigerated Warehousing and Storage
This industry comprises establishments primarily engaged in operating refrigerated warehousing and storage facilities. Establishments primarily engaged in the storage of furs for the trade are included in this industry. The services provided by these establishments include blast freezing, tempering, and modified atmosphere storage services.

493190 Other Warehousing and Storage
This industry comprises establishments primarily engaged in operating warehousing and storage facilities (except general merchandise, refrigerated, and farm product warehousing and storage).

424 Merchant Wholesalers, Nondurable Goods
Industries in the Merchant Wholesalers, Nondurable Goods subsector sell nondurable goods to other businesses. Nondurable goods are items generally with a normal life expectancy of less than three years. Nondurable goods merchant wholesale trade establishments are engaged in wholesaling products, such as paper and paper products, chemicals and chemical products, drugs, textiles and textile products, apparel, footwear, groceries, farm products, petroleum and petroleum products, alcoholic beverages, books, magazines, newspapers, flowers and nursery stock, and tobacco products. The detailed industries within the subsector are organized in the classification structure based on the products sold. Business-to-business electronic markets, agents, and brokers primarily engaged in wholesaling nondurable goods, generally on a commission or fee basis, are classified in Subsector 425, Wholesale Electronic Markets and Agents and Brokers.

424710 Petroleum Bulk Stations and Terminals
This industry comprises establishments with bulk liquid storage facilities primarily engaged in the merchant wholesale distribution of crude petroleum and petroleum products, including liquefied petroleum gas.

487 Scenic and Sightseeing Transportation
Industries in the Scenic and Sightseeing Transportation subsector utilize transportation equipment to provide recreation and entertainment. These activities have a production process distinct from passenger transportation carried out for the purpose of other types of for-hire transportation. This process does not emphasize efficient transportation; in fact, such activities often use obsolete vehicles, such as steam trains, to provide some extra ambience. The activity is local in nature, usually involving a same-day return to the point of departure. The Scenic and Sightseeing Transportation subsector is separated into three industries based on the mode: land, water, and other.

487210 Scenic and Sightseeing Transportation, Water
This industry comprises establishments primarily engaged in providing scenic and sightseeing transportation on water. The services provided are usually local and involve same-day return to place of origin.

561 Administrative and Support Services
Industries in the Administrative and Support Services subsector group establishments engaged in activities that support the day-to-day operations of other organizations. The processes employed in this sector (e.g., general management, personnel administration, clerical activities, cleaning activities) are often integral parts of the activities of establishments found in all sectors of the economy. The establishments classified in this subsector have specialization in one or more of these activities and can, therefore, provide services to clients in a variety of industries and, in some cases, to households. The individual industries of this subsector are defined on the basis of the particular process that they are engaged in and the particular services they provide. Many of the activities performed in this subsector are ongoing routine support functions that all businesses and organizations must do and that they have traditionally done for themselves. Recent trends, however, are to contract or purchase such services from businesses that specialize in such activities and can, therefore, provide the services more efficiently. The industries in this subsector cannot be viewed as strictly "support." The Travel Arrangement and Reservation

Services industry group includes travel agents, tour operators, and providers of other travel arrangement services, such as hotel and restaurant reservations and arranging the purchase of tickets, serving many types of clients, including individual consumers. This group was placed in this subsector because the services are often of the "support" nature (e.g., travel arrangement), and businesses and other organizations increasingly purchase such services. The administrative and management activities performed by establishments in this sector are typically on a contract or fee basis. These activities may also be performed by establishments that are part of the company or enterprise.

561510 Travel Agencies
This industry comprises establishments primarily engaged in acting as agents in selling travel, tour, and accommodation services to the general public and commercial clients.

561520 Tour Operators
This industry comprises establishments primarily engaged in arranging and assembling tours. The tours are sold through travel agencies or tour operators. Travel or wholesale tour operators are included in this industry.

926 Administration of Economic Programs
This subsector comprises government establishments primarily engaged in the administration of economic programs.

926120 Regulation and Administration of Transportation Programs
This industry comprises government establishments primarily engaged in the administration, regulation, licensing, planning, inspection, and investigation of transportation services and facilities. Included in this industry are government establishments responsible for motor vehicle and operator licensing, the Coast Guard (except the Coast Guard Academy), and parking authorities.

APPENDIX C

DEFINITION OF SECTORS USED IN THE ECONOMIC IMPACT ANALYSIS

Commercial Harbors System

1. Cargo services –
    a. Container ships (e.g., Matson, Pasha)
    b. Cargo barges (Young Bros, AML/Sause Bros at KBPH)
    c. Liquid bulk (through pipelines like HFFC and distribution like Par at KBPH)
    d. Dry bulk (Ameron, Hawai‘ian Cement at KBPH)
2. Passenger services –
    a. Passenger cruise ships (NCL, etc.)
    b. Excursion ships (Star of Honolulu, Atlantis Submarines)[45]
3. Commercial fishing services –
    a. Fishing Village (United Fishing Agency)
    b. Fishing boat owners
4. Marine support services –
    a. Ship repair and maintenance services (PSI and Marisco at KBPH)
    b. Tugboat and tow boats (Foss)
    c. Shipping agents (Norton Lily)
    d. Labor (ILWU, HSI)
    e. Fuel bunkering services
    f. Production facilities (Grace Pacific Asphalt, water bottling plant)
    g. Pilots
    h. Diving and salvage companies (PENCO)
    i. Water taxi (P&R)
    j. Chandlery and suppliers
    k. Oil spill response
    l. Surveyors (inspects the vessels and the cargo)
    m. Etc.
5. Government services
    a. State and Local Government Agencies
    b. DOTH Administration and Operations
    c. DOTH CIP spending (Government Investment)
    d. Federal Government Services[46]

In other studies of economic impact of ports and harbors, additional sectors are typically included in an economic impact analysis. Therefore, these additional sectors were included and classified as the broader maritime industry.

[45] NAICS Code 487 “Scenic and sightseeing transportation, water”

[46] Federal government agencies such as DHS, CBP, Coastguard, Dept of Ag, Army Corp could also be included but comparable data was not readily available.

Broader Maritime Industry

- Surface Transportation Sector: Trucking companies that move between the harbor and the inland orgin or destination
    - General freight trucking
    - Specialized freight
- Harbor Tenants and Dependent Shippers/Consignees Sector
    - Fish Auction
    - Merchant Wholesalers, Nondurable Goods
- Cruise Activity
    - Passenger cruise ships
        - Travel agencies, tour operators (a portion of cruise)
- Petroleum bulk stations, storage, and imports (Par Hawai‘i - Their offshore mooring to import crude oil, and their refinery and storage tanks at Campbell Industrial Park. The fuel component makes up a small proportion of DOTH cargo throughput, which is made up of fuels distributed via pipelines through Kalaeloa Barber Point Harbor and shipped to the Neighbor Islands. Island Energy Services (IES), similar pipelines and terminal facilities)
- Ship repair at Pearl Harbor (BAE, which handles large military ships and submarines)
- Small boat harbors (owned by DLNR), Character boats at Kewalo Basin (owned by DLNR), Private marinas (Ko’olina)

Table 7: Crosswalk Table of Sectors in the Commercial Harbors System to NAICS Codes

Sectors		Activities	Examples	NAICS
Commercial Harbors System	**Cargo services**	Container ships	Matson, Pasha	483111
		Cargo barges	Young Bros, AML/Sause Bros at KBPH	483211
		Liquid bulk	(through pipelines like HFFC and distribution like Par at KBPH)	424710
		Dry bulk	(Ameron, Hawai‘ian Cement at KBPH)	
	Commercial fishing services	Fishing Village	(United Fishing Agency)	445220
		Fishing boat owners		114111
	Marine support services	Ship repair and maintenance services	(PSI and Marisco at KBPH)	336611
		Tugboat and tow boats	(Foss)	488330
		Shipping agents	(Transmarine Navigation and Waldron Norton Lilly)	488610
		Labor	(MHR and HSI)	488320
		Fuel bunkering services		
		Production facilities	(Grace Pacific Asphalt and Toell)	
		Pilots		488330
		Diving and salvage companies	(PENCO)	488330
		Water taxi	(P&R)	483212
		Chandlery and suppliers		424990
		Marine Spill Response (at Pier 15)		
		Surveyors	(inspects the vessels and the cargo)	488390
	Passenger services	Passenger cruise ships	NCL, etc.	483112
		Excursion ships	Star of Honolulu, Atlantis Submarines	487210
	Government services	State and Local Government Agencies	DOT Harbors	
		DOT Harbors Administration and Operations		
		DOT Harbors CIP spending (Government Investment)		
Other Maritime and Harbor Related Industries	**Surface Transportation**	Truck transportation		484
	Harbor Tenants	Warehousing and storage		493120
	Cruise Activity	Travel agencies		561510
		Tour operators		561520
	Petroleum Bulk Stations	Import crude oil through offshore mooring		424710
	Ship Repair	Ship repair at Pearl Harbor	Not included	

APPENDIX D

SURVEY INSTRUMENT FOR MARKET MANAGERS

Economic Value Interview Outline
Date: **Interviewer:**

Purpose is to document how dependent our food supply is on the harbors. The challenge has been to find the right person to speak with.

Hello, I'm… from SMS Research. We are working on behalf of the Hawai'i State Department of Transportation Harbors Division conducting a study on the economic value of Harbors throughout the state. We would like to speak with someone who can answer a couple of questions about how dependent (name of store) is on deliveries going through the harbor. Will you be able to assist me with those questions? If no, can you please refer me to the right person. All responses are confidential and will be combined with other responses in our report. Thank you for your assistance.

Store:
Person being interviewed:
Location:
Answering for one store? Multiple stores?

Number and location of stores that are covered by the following questions? [may need to ask two sets of questions separated by county or at least by O'ahu v. Outer Islands]

1. Approximately what percent of food being sold in your store(s) is brought in from off island?

2. What percent of the food is brought through the harbor?

3. Approximately what percent of non-food items being sold in your store(s) is brought in from off island?

4. What percent of non-food items is brought though the harbors?

5. How often do your stores receive a shipment that goes through the harbors? (Daily, weekly, bi-weekly, etc.)

6. If deliveries were stopped from coming through the harbor, how many weeks before your food supply would be severely diminished?

7. Non-food supplies?

8. Do you have a plan to put into place should this occur?

Additional Comments:

SURVEY – RANGE OF RESPONSES

The following table represents an average of responses broken out by location and type of stores.

Table 8: Food Supply Survey Average Results by Store Location and Size

Survey of Markets Throughout the State	Outer Island Larger Chain Stores	Outer Island Small Stores	Statewide Small Stores	O'ahu Chain Stores	O'ahu Big Box Stores
% of food sold brought in from off-island	80%	97%	80%	90%	75%
% of food brought in from off-island that arrives via the harbor(s).	85%	85%	75%	90%	70%
% of non-food items sold that are brought in from off-island	90%	100%	90%	95%	80%
% of non-food items brought in from off-island that arrives via the harbor(s).	95%	97%	50%	95%	80%
Frequency of shipments through the harbor(s)	4 times a week	1.5 times per week	4 days a week	5 times a week	5 times a week
If deliveries through the harbor were stopped, how many weeks before your food supplies would be severely diminished?	1.5 weeks	1.75 weeks	3 weeks	1.5 weeks	2 weeks
If deliveries through the harbor were stopped, how many weeks before your non-food supplies would be severely diminished?	1.5 weeks	1.75 weeks	3 weeks	1.5 weeks	2 weeks

APPENDIX E

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