Draft Environmental Impact Statement

PROPOSED LAHAINA SMALL BOAT HARBOR FERRY PIER IMPROVEMENTS

Prepared for:

State of Hawai`i, Department of Land and Natural Resources
and the Accepting Authority:
Governor, State of Hawai`i

December 2007

MUNEKIYO HIRAGA, INC.

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This document was prepared under my supervision and the information submitted, to the best of my knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18 of the Hawai`i Administrative Rules, as appropriate.

Mich Hirano, AICP
Project Manager

MUNEKIYO HIRAGA, INC.

DEC 2 0 2007

PROPOSED LAHAINA SMALL BOAT HARBOR
FERRY PIER IMPROVEMENTS
MAUI, HAWAI`I

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PREPARED PURSUANT TO:

National Environmental Policy Act of 1969, §102 (42 U.S.C. §4332); and Federal Transit Law (49 U.S.C. §5301(e), §5323(b) and §5324(b)); *49 U.S.C. §303 (formerly Department of Transportation Act of 1966, §4(f)); National Historic Preservation Act of 1966, §106 (16 U.S.C. §470f); and Executive Order 12898 (Environmental Justice)*

AND

HAWAI`I REVISED STATUTES, CHAPTER 343, STATE ENVIRONMENTAL REVIEW LAW AND STATE OF HAWAI`I, DEPARTMENT OF HEALTH, TITLE 11, CHAPTER 200, ENVIRONMENTAL IMPACT STATEMENT RULES
by the
FEDERAL TRANSIT ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

and the

STATE OF HAWAI`I, DEPARTMENT OF LAND AND NATURAL RESOURCES
AND DEPARTMENT OF TRANSPORTATION

with the cooperation of

United States Environmental Protection Agency, Region IX; United States Department of Army Corps of Engineers, Pacific Ocean Division; National Oceanic and Atmospheric Administration, National Marine Fisheries Service; and United States Fish and Wildlife Service

Leslie Rogers ______________________ 12/14/07 ______________
Name: Leslie Rogers
Regional Administrator, Region IX
Federal Transit Administration

Date of Approval

Ken C. Kawahara ______________________ 11/02/07 ______________
for Laura H. Thielen
Chairperson
State of Hawai`i, Department of Land and Natural Resources

Date of Approval

ABSTRACT

The applicant is proposing to build a new interisland ferry pier approximately 60 feet to the north of the existing pier at the Lahaina Small Boat Harbor. The new pier will be approximately 115 feet long and 35 feet wide, will be on piles, and will be able to accommodate approximately 100 passengers. A low-rise, open-sided structure on the deck of the new pier is proposed to provide shade and shelter for pier users. Ancillary actions include dredging to widen the entrance channel and berthing area to the north of the new pier; construction of two (2) sewage pump out stations; construction of a concrete pedestrian walkway measuring 16 feet by 60 feet to connect the existing pier with the new pier structure; replacement of the existing administration office and ferry ticket booth; improvements to the passenger loading and drop off area; relocation and expansion of onsite parking stalls; sidewalk expansion along the northwestern portion of Hotel Street; and resurfacing of a portion of Wharf Street.

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A 45-day period has been established for comments on this document. Comments may be submitted in writing or may be made orally at the public hearing(s). Written comments should be submitted to Eric Hirano at the address above.
Information on the public hearing can also be obtained from Eric Hirano.

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S. SUMMARY

S. 1 Background

The State of Hawai`i recognizes that the existing commuter ferry operations from the islands of Lana`i and Moloka`i to the island of Maui are vital to the economic and social well-being of the County of Maui and to the State.

Previously, commuter transportation between the islands was to a large extent carried out by regularly scheduled air travel. Interisland flights were numerous, convenient, and affordable. However, since the tragic events of September 11, 2001 (9/11), direct commuter air transportation service between Maui and Lana`i and Maui and Moloka`i by the two (2) main airlines in Hawai`i has been severely cut back and many flights have been discontinued.

In light of the declining level of air service between the islands of Maui, Lana`i, and Moloka`i, coupled with the increased travel times and fares, the demand for the interisland ferry services is anticipated to increase in the future.

S. 2 Purpose and Need for Action

Existing interisland ferry facilities on Maui are located at the Lahaina Small Boat Harbor (LSBH). The LSBH is located in Lahaina Town on the west coast of Maui. The existing pier at the LSBH is the only transportation hub on Maui for the two (2) interisland ferry service providers, Hono Heke Corporation (Expeditions) and Sea Links of Hawai`i, that provide ferry services to the islands of Lana`i and Moloka`i, respectively. The ferry service provides an affordable interisland transportation mode for the predominately minority and low income communities on the islands of Lana`i and Moloka`i to gain access to employment, government, health services, education, shopping, and recreational opportunities on the island of Maui.

The existing pier contains the harbor master's office, a ferry kiosk, a fish hoist, and fuel dispensing, sewage pump out and docking facilities. It is used for loading and unloading passengers onto recreational and commercial vessels, including the interisland ferries, cruise ship tenders, and tour/dive boats. In addition to the ferry traffic, LSBH is home port to 47 commercial vessels and approximately 71 recreational vessels. The existing pier, used by the interisland ferries at the LSBH, is unable to efficiently and safely support the current level and anticipated future level of usage.

S. 3 Alternatives Considered

S. 3.1 Screening and Scoping of Alternatives

The DLNR, Division of Boating and Ocean Recreation assessed 14 non-structural alternatives to mitigate safety concerns at the LSBH. The assessment of the non-structural alternatives was considered to have nominal impact on existing pier use and would require administrative rule changes prior to implementation. Non-structural alternatives, such as open moorage, loading and unloading passengers from assigned berths and restricting off-shore mooring, conflicted with current State administrative rules and regulations. Elimination of harbor facilities, such as sewer pump-out stations and fuel pumps, were considered to have moderate impact on existing pier use and could potentially have adverse environmental or legal consequences. Regulating the number of cruise ships to Lahaina would have moderate impact on existing pier use, but, conflicts with Federal Interstate Commerce Rules and State policy. Enforcement of time limits or designated times on pier use would have minor impact on pier use, but are not enforceable due to existing State rules and regulations. Use of the west side of the existing pier would have moderate impact on pier use, but would be unsafe during unfavorable weather/ocean conditions. In summary, the non-structural alternatives were not considered to be effective in meeting the purpose and needs at the LSBH.

S. 3.2 Alternatives Considered

S. 3.2.1 Alternative 1: Independent Pier and Two-Story Ferry Building

The proposed independent pier and two-story ferry building alternative is located approximately 60 feet to the north of the existing pier. The new pier would consist of a concrete and sheet pile system structure that will be 35 feet in width and 115 feet in length. A concrete walkway (16 ft. width X 35 ft. length) would provide pedestrian access between the shoreline and new ferry pier. The concrete walkway would be connected to a new landside concrete bulkhead on the mauka (shore side) of the existing seawall and to the new ferry pier. The walkway would bridge over the existing seawall and ocean below. A two-story building (32 ft. in height) would be constructed on the new ferry pier. The ground floor will include a little over 4,000 square feet of open area for passenger arrivals and departures, while the second floor would contain a total interior floor area of approximately 2,000 square feet, which includes public restrooms, a janitor's closet, a wrap-around deck, concession space, and administrative and ferry offices.

Landside improvements would consists of the resurfacing of Wharf Street between Hotel and Papalekane Streets; relocating four (4) existing parking stalls and installing four (4) new stalls on the north side of Papalekane Street; widening the sidewalk along the northwestern portion of Hotel Street; demolishing the existing Administrative Office (Harbor Master's Office) and Ferry Ticket Booth.

New dredging of the berthing area and entrance channel to -13 feet msl would be required. The capital cost for Alternative 1 is estimated to be $8.8 million.

S. 3.2.2 Alternative 2: Attached Sheet Pile Ferry Pier and Single-Story Shade Structure

The proposed attached sheet pile pier is located approximately 60 feet to the north of the existing pier. The new pier would consist of a concrete and sheet pile system structure that will be 35 feet in width and 115 feet in length. A concrete walkway (16 ft. width X 60 ft. length) would provide pedestrian access between the existing and new ferry pier. Two (2) low-rise, open sided, roofed structures (16 ft. in height) connected by an open trellis will provide full and/or partial cover over the approximately 4,000 square foot ferry pier for passenger arrivals and departures.

Auxiliary improvements would consists of installing two (2) sewage pump-out stations, hose bibs, security lighting, water/sewer utilities and a small floating platform with a movable gangway (surfer access) on the new ferry pier.

Landside improvements would consist of replacing the existing Administration Office (Harbor Master's Office) and Ferry Ticket booth; resurfacing of Wharf Street between Hotel and Papalekane Streets; relocating four (4) existing parking stalls and installing four (4) new stalls on the north side of Papalekane Street; and widening the sidewalk along the northwestern portion of Hotel Street.

Maintenance and new dredging of the berthing area and entrance channel to -13 feet would also be required. The capital cost for Alternative 2 is estimated to be $7.7 million.

S. 3.2.3 Alternative 3: Attached Pile Supported Ferry Pier and Single-Story Shade Structure

Alternative 3 is similar to Alternative 2, but with a pile supported pier. The new pier would consist of a concrete structure and supported by concrete foundation piles. As well, the walkway would be supported by concrete foundation piles embedded in the ocean bottom. Two (2) low-rise, open sided, roofed structures (16 ft. in height) connected by an open trellis will provide full and/or partial cover over the approximately 4,000 square foot ferry pier for passenger arrivals and departures.

Auxiliary and landside improvements would be similar to Alternative 2.

Maintenance and new dredging of the berthing area and entrance channel to -13 feet would be required. The capital cost for Alternative 3 is estimated to be $8.3 million.

S. 3.2.4 Alternative 4: No Action

The "no action" alternative would retain existing operating conditions and levels of service at the LSBH. This alternative would leave the harbor as is, without any improvements for the interisland ferry.

S. 3.3 Funding Sources

This project will be funded by Section 319 of the U.S. Department of Transportation, Federal Transit Administration, appropriations pursuant to 49 USC 5309 - New Starts. The project cost-sharing breakdown is typically 80 percent Federal and 20 percent State. Funding to date includes $280,000.00 in Federal funds and $56,000.00 in State funds. It is anticipated the planning phase will be completed by June 30, 2008. Design is anticipated to commence in January 2009 and estimated to cost $1.1 million. Construction is anticipated to commence in June 2010 and cost $8.3 million.

S. 4 Affected Environment and Environmental Consequences

S. 4.1 Neighborhoods and Communities

The proposed alternative ferry pier improvements will complement existing, established uses at the LSBH. However, from a land use perspective, each project alternative will have varying degrees of consequences with surrounding land uses in the area.

In Alternative 1, the view of the historic seawall along the harbor bulkhead may be obstructed by the placement of the access ramp. The size of the two-story ferry building will alter the historic character of Lahaina Town and obstruct ocean views from adjacent upland uses.

In Alternative 2, the single-story shade structure will obstruct some ocean views, however, it will be low and open sided to allow views to the ocean over and through the structure. The style of the roof, administration office and ferry ticket booth will be designed to reflect the historic character of Lahaina Town.

Alternative 3 will have similar environmental consequences on community character as Alternative No. 2. In addition, the open area underneath the new pier deck would allow more of the ocean water to be viewed from adjacent land uses.

Alternative 4 would maintain existing conditions at the LSBH. The overcrowding and congestion at the harbor will continue to adversely impact operational efficiencies.

S. 4.2 Land Use Zoning and Economic Development

The proposed ferry pier will involve work in areas occupied by the former berth for the Carthaginian II, the existing harbor pier, the waters of the LSBH, and work in the County rights-of-way on Wharf and Hotel Streets. The proposed action will be in the State land use Urban district and waters of the State of Hawai`i which fall within the State land use Conservation district.

The portions of LSBH development alternatives, which are located within the State Urban district, are deemed permissible within the State Urban district.

The proposed action located within the Conservation district is consistent with the objectives pursuant to Hawai`i Administrative Rules, Title 15-15-20, governing uses within the Conservation district.

Land use guidelines are established by the West Maui Community Plan land use map. The site of the existing ferry pier and administration office are designated for Park (PK) use in the community plan map. This designation applies to lands developed for recreational use. The proposed project alternatives are a component of the LSBH land uses which includes both commercial and recreational uses and, therefore, are in compliance with the West Maui Community Plan land use designation.

The project area is located within the limits of Historic District No. 1. The regulations for Historic District No. 1 cover a multitude of uses ranging from single-family to public/quasi-public to business/commercial uses. The proposed alternatives are permitted uses in Historic District No. 1.

The proposed alternative plans will have beneficial economic impacts to the West Maui region through construction employment. Alternative 1 will have the greatest positive impact during construction due to its greater capital cost, relative to Alternatives 2and 3.

The interisland ferry provides greater economic opportunity to the residents of the islands of Lana`i and Moloka`i, whom rely on the ferry to commute to jobs in West Maui. Moloka`i has one of the highest unemployment rates in Hawai`i and access to jobs in West Maui will have beneficial economic consequences for the residents of Moloka`i.

S. 4.3 Land Acquisition, Displacements, and Relocation of Existing Users

Land acquisition will not be required for any of the plan alternatives. No displacement or relocation of the existing users will be required with the proposed alternatives under consideration.

S. 4.4 Historic, Archaeological, and Cultural Resources

An Archaeological Inventory Survey was carried out at the LSBH site to identify historic, archaeological and cultural resources. Historic and cultural sites within proximity of the project area include the Hauola Stone, Brick Palace, Pioneer Inn, Banyan Tree and Lahaina Courthouse.

Cultural assessment interviews were also conducted to obtain a broader range of cultural resource perspectives in the proposed project area. The people interviewed ranged from cultural practitioners to those born and raised in Lahaina and recognized in the community for their knowledge of Hawaiian culture and history.

Cultural interviewees emphasized the concept of the ahupua'a of Waine'e, when discussing the potential cultural impacts, rather than just looking at the project area and immediate surrounding properties. Interviewees indicated that everything in the Waine'e ahupua'a, extending from the mountain to the sea, is connected. Important features identified in this context in the vicinity of the LSBH were Moku`ula (the summer residence of King Kamehameha III), Hauola Stone, King

Kamehameha III's red brick house, the reef fronting the LSBH and the Keawa`iki and `Uo surf sites outside the harbor entrance.

The LSBH is located within the Lahaina Historic District, a National Historic Landmark. Lahaina is also on the National and State Register of Historic Places, because it maintains the atmosphere of a mid-19th century Hawaiian seaport and port of call for American whalers.

S. 4.5 Visual and Aesthetic Qualities

The LSBH is located along the shoreline and is situated in an area which provides scenic views. Scenic resources in the vicinity include Lahaina Town itself, and the West Maui Mountains, which are to the east of the LSBH, as well as the Pacific Ocean and the offshore island of Lana`i, which are to the west.

The two-story building in Alternative 1 will have greater potential impact on scenic ocean views due to its height. The low-rise, open-sided structure in Alternatives 2 and 3 has been designed to have minimal visual impact on views to and from the harbor. This structure will be consonant with the standards of the Lahaina Historic District, and in accordance with the Architectural Style Book for Lahaina.

S. 4.6 Park Lands and Recreation Areas

In addition to recreational boating facilities at the LSBH, popular surf spots include the Keawa'iki and 'Uo. Waves breaking over the shallow reef to the north and south of the LSBH causes a rise in water level known as setup. This wave set up causes the two (2) popular surfing sites near the LSBH. The Keawa`iki surf site is located just outside the harbor entrance on the north side and `Uo surf site is located on the south side of the harbor. Passive recreational areas in the vicinity of the project include the grassed, open space area around the Brick Palace and the grassed, courtyard area surrounding the Banyan Tree. Recreational facilities in outlying areas include Puamana Park, the Lahaina Aquatic Center, the Lahaina Recreation Center, Malu`uluolele Park, and Kamehameha Iki (Armory) Park.

The proposed project alternatives will benefit recreational boaters and use of the harbor by helping to alleviate congestion in the harbor. Alternative 1 will have a greater beneficial impact in relieving pedestrian congestion at the LSBH due to the relocation of the Harbor Master's office and ferry ticket booth on the second story of the pier building than Alternatives 2 and 3. Alternative 1 will redirect more pedestrian traffic away from the existing facilities than Alternatives 2 and 3. Alternative 1 may impact the open space around the Brick Palace by increasing pedestrian traffic.

The dredging required to widen the entrance channel and berthing area to the north of the pier, which are common to Alternatives 1, 2 and 3 will be confined primarily to the inshore terminus of the entrance channel. As such, existing surf sites located at the reef margins should not be adversely impacted by development of either alternatives.

S. 4.7 Air Quality and Energy

Air quality will be temporarily impact by construction activities. Alternatives 1 and 2 will have more construction-related air quality impacts than Alternative 3 due to the fill placement under the new pier. In the long term, project-related vessel and vehicle traffic will generate exhaust emissions. However, these emissions are not expected to adversely impact local and regional ambient air quality conditions.

Alternative 1 will use more electrical energy due to the size of the Administration office and facilities proposed for the two-story building. Alternatives 2 and 3 will have minimal energy use since the shade structure on the pier will be open sided and naturally vented and illuminated.

S. 4.8 <u>Noise and Vibration</u>

Noise and vibration impacts during construction will be greater with Alternatives 1 and 2 due to placement of sheet pile and fill to support the new pier. In Alternative 3, it is anticipated the piles will be drilled and set in place, thereby, avoiding the noise and vibration caused by pile driving activities. In the long term, vibration impacts caused by vessel operations would be less in Alternatives 1 and 2 due to the solid nature of the sheet pile and fill structure.

From a long-term perspective, implementation of the project alternatives are not anticipated to generate adverse noise impacts.

S. 4.9 <u>Biological Resources</u>

There are no rare, threatened, or endangered species of land based plant life within the LSBH.

The reef flat to the south of the entrance channel was noted as being more productive and diverse than the reef flat to the north, which is the site of the proposed pier. Species commonly encountered in the LSBH area include red algae (*Acanthophora spicifera*), doted periwinkle (*Littoraria pintado*), the thin-shelled rock crab (*Grapsus tenuicrustatus*), and the yellow-striped goatfish (*Mulloidichthys flavolineatus*). Prominent coral species include rice coral (*Montipora capitata*) and spreading coral (*Montipora patula*). Coral growths are more prominent on the sides of the entrance channel than on the reef flats.

The federally threatened green sea turtle and endangered hawksbill sea turtles, Hawaiian Monk Seal, and Humpback Whales are known to exist in Hawaiian waters. These marine species are protected under the Endangered Species Act and the Humpback Whale and Hawaiian Monk Seal are also protected under the Marine Mammal Endangered Species Act.

Potential adverse impact to the protected marine species may be mitigated by following Best Management Practices (BMPs) during construction, such as: use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions; removing construction-related debris that may pose an entanglement hazard to marine protected species from the project site; eliminating the need for stockpiling of project-related materials (fill, revetment rock, pipe, etc.) in the water; and fueling project-related vehicles and equipment away from the water.

In Alternatives 1, 2, and 3, 2,720 s.f. of reef flat will be dredged and replaced by sand habitat. The net loss of reef flat habitat in Alternatives 1 and 2 was estimated to be 166,155 s.f. years and Alternative 3 was estimated to be 116,845 s.f. years.

In Alternatives 1, 2, and 3, 14 existing cement pilings and associated community will be removed, affecting 528 s.f. of this habitat type. This habitat will be lost in Alternatives 1 and 2. The net loss is estimated at 17,080 s.f. years. Alternative 3 will provide 86 new piles, creating 3,770 s.f. of new habitat. Alternative 3 results in a net gain of 60,309 s.f. for the cement piling community.

In Alternatives 1, 2, and 3, 2,720 s.f. of reef flat community will be permanently removed. No proposed project designs will produce in-kind habitat, therefore, compensatory mitigation is recommended.

Alternative 3 minimizes the impact to the nearshore marine environment and will result in compensatory program on the reef flat that will provide a net gain of 15,742 s.f. years to the reef flat marine environment.

S. 4.10 Natural Resources and Water Quality

The LSBH is listed as an impaired body of water by the State due to turbidity. The waters of the LSBH are also classified as essential fish habitat by the National Marine Fisheries Service and Class "A" by the Department of Health. The objective for the Class "A" water is to protect their use for recreation and aesthetic qualities.

Approximately 2,500 cubic yards of material will need to be dredged from the LSBH to provide the required draft for vessels to utilize the new pier. Dredging will involve deepening and widening of the entrance channel and berthing area to the north of the proposed new ferry pier.

Construction-related activities will result in short-term increases in turbidity. The use of Best Management Practices (BMPs) such as silt curtains can mitigate increased turbidity. The proposed dredged material disposal site will be on land at the Kahului Harbor. There are no long-term impacts to water quality anticipated from construction-related activities.

S. 4.11 Hazardous Materials

The dredged spoils will be contained in a tanker barge and transported to the Department of Land and Natural Resources approved disposal site at the Kahului Harbor for dewatering and land disposal.

Alternatives 1, 2, and 3 are similar in the degree and amount of dredging, and their requirement of the demolition of existing mooring dolphins, Harbor Master's office and ferry ticket booth. Alternative 3 will have more area of sand disposal due to the core from drilling and setting the piles than Alternatives 1 and 2 which do not have piles.

S. 4.12 Cumulative and Secondary Impacts

Project Alternatives 1, 2, and 3 are not part of a larger action, nor would they occur within the context of such actions. There are no direct community growth impacts resulting from or occurring with project Alternatives 1, 2, and 3. There are no other public works projects anticipated within the project alternatives contexts.

There are no foreseeable, adverse secondary impacts associated with the project Alternatives 1, 2, or 3. They are not considered a generating component for population, nor will they place additional burden upon infrastructure or the environment.

S. 5 Transportation Systems

S. 5.1 Highway

In general, the proposed improvements on Wharf Street and Papalekane Street, which are common to all pier development alternatives, will improve pedestrian and vehicular traffic flow from existing conditions. In Alternative 1, the access ramp to the pier will directly load and off-load passengers onto the harbor bulkhead near Wharf and Papalekane Streets. The off-loading ferry passengers could potentially disrupt vehicular traffic flow along these streets for a limited time. However, with the Harbor Master's office and ferry ticket booth located on the new pier, pedestrian congestion at the existing pier will be reduced in Alternative 1.

S. 5.2 Parking Demand and Supply

There are approximately 690 marked parking stalls, 40 unmarked parking stalls, 10 bus parking stalls, and 6 limousine parking stalls in and around the LSBH. There are enough parking stalls in proximity to the ferry terminal to accommodate related parking requirements.

Pedestrian traffic in the vicinity of the LSBH is fairly high. Approximately 862 pedestrians in the AM peak period and 1,115 pedestrians during the PM peak periods were observed traveling along Hotel Street on a Boat Day. Modifications to widen the existing pedestrian sidewalk along the northwest side of Hotel Street has been incorporated into the proposed development alternatives to facilitate pedestrian movement.

S. 5.3 Transit

The public transportation system from Kahului to West Maui has been in operation since July 2004. There are two (2) 35 passenger buses servicing the route. Ridership is steadily increasing.

S. 5.4 Freight Movements

Currently, the interisland commuter ferries carry a small amount of freight to and from the islands. Freight is limited to what can be easily carried on. Alternatives 1, 2 and 3 have common landside improvements which provide improvements to traffic circulation, passenger loading and unloading from the existing conditions.

S. 6 Evaluation of Alternatives

S. 6.1 NEPA Evaluation

The State of Hawai`i, Division of Boating and Ocean Recreation (DOBOR) has established the following project purpose and need for the LSBH: a) Provide a safe and reliable docking facility for commuter ferry operations servicing Lana`i, Moloka`i, and West Maui; b) Promote the efficient and safe use of the existing facilities at the LSBH; c) Effectively control and manage the small boat harbors and facilities of the State in order that the general public may enjoy safe, orderly and convenient water recreation; and d) State small boat harbors are constructed, maintained, and operated for the purposes of: (1) Recreational boating activities; (2) Landing of fish; and (3) Commercial vessel activities.

Alternatives 1, 2, and 3 would equally meet the project purpose and need for improved safety at the LSBH and to provide safe and readily available loading and unloading docking facilities for the interisland ferry service. Alternative No. 4 would not address the project purpose and need.

S. 6.2 Alternative Evaluation

The evaluation of Alternatives 1, 2, 3 and 4 pursuant to the NEPA criteria is summarized below.

NEPA Alternative Evaluation Summary

Evaluation Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4
5.1.1 Satisfying Purpose and Need	Yes	Yes	Yes	No
5.1.2 Benefits and Environmental Effects				
5.1.2.1 Neighborhood and Communities	a. 2-story building not in historic character b. Access ramp compromises integrity of historic seawall	a. Lower profile span structure can be designed in Lahaina architectural style b. Does not compromise seawall	a. Lower profile open structure can be designed in Lahaina architectural style b. Does not compromise seawall	a. Existing Harbor Master office does not architecturally conform b. Does not compromise seawall
5.1.2.2 Land Use and Economic Development	a. Meets land use plans and criteria b. Capital cost $8.8 million	a. Meets land use plans and criteria b. Capital cost $7.7 million	a. Meets land use plans and criteria b. Capital cost $8.3 million	a. Meets land use plans and criteria b. No capital cost benefit
5.1.2.3 Land Acquisition and Displacement	No	No	No	No
5.1.2.4 Historic Archaeological and Cultural Resources	a. Historic seawall- Yes b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No
5.1.2.5 Visual and Aesthetic Qualities	a. 2-story building will impact visual quality b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - No
5.1.2.6 Park Lands and Recreation Areas	a. Reduces congestion in harbor b. More open area on existing pier	a. Reduces congestion in harbor b. Less open area on existing pier	a. Reduces congestion in harbor b. Less open area on existing pier	a. Does not reduce congestion b. Does not result in improvements to park land and recreation areas
5.1.2.7 Air Quality and Energy	a. Short-term impact on air quality during filling behind sheet wall b. Energy use higher due to larger building	a. Short-term impact on air quality during filling behind sheet wall b. Some increase in energy use with expansion of Harbor Master office	a. No filling under pier required b. Some increase in energy use with expansion of Harbor Master office	a. No construction b. No change in energy use

Alternative 1 has greater economic benefit than Alternatives 2, 3 and 4 due to the increased capital cost. Although Alternative 4 has the least environmental effects, it does not satisfy the project purpose and needs. The two-story building proposed in Alternative 1 would impact the character of the neighborhood and the visual and aesthetic qualities of the area more than Alternatives 2 and 3. In addition, the Alternative 1 access ramp connecting to the harbor bulkhead will be built over the historic seawall and would compromise the historical integrity of the seawall. Alternatives 2 and 3 share some of the same features with respect to comparative evaluation of land use and economic development and historic, archaeological and cultural resources criteria. However, Alternative 3 has the least quantitative impact with respect to biological resources and impacts on air quality and energy. Alternative 3 is, therefore, deemed to be the "Least Environmentally Damaging Practicable Alternative" (LEDPA) that is capable of implementation taking into consideration cost, existing, technology, environmental mitigation and logistic in light of meeting the overall project purpose.

S. 7 Mitigation Measures

Potential effects include noise-generated impacts occurring from site preparation and construction activities., In addition, temporary air quality impacts associated with dust generated from construction activities, and exhaust discharged by construction equipment. The dredging of the entrance channel and berthing area on the north side of the new pier will remove approximately 2,720 s.f. of reef flat and 17,040 s.f. of sand habitat. However, this loss will be mitigated and offset by the pile supported pier design of Alternative 3, which is anticipated to result in a net gain of 60,309 s.f. years of reef flat habitat. Recently dredged sand habitat is thought to be repopulated on a relatively short time span, in general, within six (6) months to one (1) year. Therefore, no additional compensatory mitigation was recommended to offset loss of sand habitat.

S. 8 49 U.S.C. §303 (Department of Transportation Action of 1966 - Section 4(f)) Evaluation

As the subject action uses Federal transportation funds and involves work in the Lahaina National Historic Landmark District, a Section 4(f) evaluation was carried out.

The Lahaina National Historic Landmark District preserves much of the style and substance of the 19th century Lahaina Town, a whaling and agricultural center at the time.

The Lahaina National Historic Landmark District is a rectangular area covering approximately 33 acres of land and extending approximately one (1) mile over the ocean. Notable historical and cultural sites in the area include Banyan Tree Park, the Hauola Stone, the Brick Palace, and the Lahaina Courthouse. Other public uses include the LSBH and the Lahaina Library.

In order to avoid Section 4(f) property, the interisland ferry pier improvements would have to be located outside of the Lahaina National Historic Landmark District and outside of Lahaina Town itself. Two (2) alternative sites outside the Lahaina National Historic Landmark District were reviewed. These sites included Mala Wharf and Ke Ka`a Point. Based on environmental, legislative and socio-economic criteria, the LSBH was determined to be the most practical alternative. Development of interisland ferry pier improvements at Mala Wharf or Ke Ka`a Point would have significantly greater environmental impacts than at LSBH. Avoidance would not improve the existing conditions and facilities at the LSBH, which are congested and unable to safely accommodate the existing use. Avoidance in the case of the Ke Ka`a site would also require the additional purchase of land by the State of Hawai`i.

S. 9 Executive Order 12898, Environmental Justice

The proposed action does not discriminate against low-income or minority populations directly or inadvertently. A number of public informational meetings were held to obtain public input. These meetings were held in the evening and were well attended by local residents, native Hawaiian organizations and fishers. The proposed improvements will benefit the County residents who rely on the ferry service to commute between the islands for employment opportunities and access to government and health services. Many of the residents of Lana`i and Moloka`i, who use the interisland ferry service, are made up of minority and low-income populations. The island of Moloka`i has high unemployment and relatively few new job opportunities. The low income residents of Lana`i and Moloka`i would benefit from the proposed improvements to the interisland ferry facilities at LSBH.

S. 10 Coordination, Consultation and Comments

S. 10.1 Stakeholder Meetings

Prior to the preparation of the EIS Preparation Notice (EISPN), two (2) stakeholders' meetings were held to present the project's initial conceptual plans and obtain early public input for the preparation of the EISPN.

The first meeting was held on April 12, 2004 at the Lahaina Intermediate School Cafeteria with approximately 25 persons in attendance.

A summary of comments received at the meeting follows:

1. The Hauola Stone is very sacred and the area around it is Kapu;
2. Potential impacts to historic sites need to be examined;
3. The new comfort station should be located in the area around the existing pier;
4. The effects of storm surf and ocean currents need to be evaluated;
5. The proposed pier improvements may increase cruise ship activity which may increase congestion and affect traffic and parking in the area;
6. The two-story ferry building will impact existing views;
7. The area around Mala Wharf should be considered as an alternate site;
8. The proposed pier improvements will add to further ship congestion in the harbor; and
9. Due to existing conditions and deferred maintenance, improvements to the existing harbor should be considered first.

The second public scoping meeting was on December 8, 2004, at the Lahainaluna Intermediate School Cafeteria. A summary of comments received which pertain to the present project follows:

1. The State should consider adding new sewer pump out facilities to the LSBH;
2. There are not enough parking spaces in the harbor vicinity;
3. The project should take high-wave conditions into account;
4. Parking at the loading dock should be reduced to 15 minutes;
5. Commercial boats should go to their slips rather than use the loading dock;
6. There is insufficient room at the LSBH and surrounding area to service a super-ferry and cruise ships;

7. Increasing the number of piers at the harbor could increase harbor use;

8. Use of the pier by surfers is a cause for concern over safety and liability issues;

9. Other sections of the LSBH also need infrastructure improvement;

10. Potential users of ferry service who live on Lana`i and Moloka`i should be included in the public process;

11. Concern that the project might impact the harbor sea-wall;

12. Ferry service needs to accommodate locals, rather than tourists.

13. Native Hawaiian traditional and customary rights need to be considered; and

14. Traffic control measures need to be considered.

S. 10.2 Memorandum of Understanding, National Environmental Policy Act and Clean Water Act Section 404 Integration Process for Surface Transportation Projects in the State of Hawai`i

Pursuant to the Memorandum of Understanding, National Environmental Policy Act and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawai`i pertaining to waters of the U.S. and sensitive species, FTA and DLNR held interagency coordination meetings with the Environmental Protection Agency (EPA), Department of the Interior, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and Department of Army (DA) to participate in the pre-scoping and scoping of the project in preparation of the draft EIS. The objective of the pre-scoping and scoping phase of the project was to develop agency concurrence on the overall project purpose, criteria for alternative selection, project alternatives to be evaluated and to determine the level of agency participation in the preparation of the draft EIS.

S. 11 Unresolved Issues

S. 11.1 Section 106 Memorandum of Agreement

Consultation has been undertaken with the State Historic Preservation Officer, National Parks Service and native Hawaiian and cultural groups pursuant to Section 106 of the National Historic Preservation Act. However, a Memorandum of Agreement (MOA) has not been entered into with the affected parties to resolve potential adverse impacts to cultural and historic properties.

S. 11.2 Compensatory Mitigation Plan

The USFWS Fish and Wildlife Coordination Action report recommended that a step by step description of the structured process be detailed in a written Compensatory Mitigation Plan. The Compensatory Mitigation Plan will need to include the following components: (a) monitoring the compensatory mitigation; (b) establishment of performance standards; and (c) assessment of the effectiveness of the implemented compensatory mitigation with long-term monitoring.

1. PURPOSE AND NEED

1. PURPOSE AND NEED

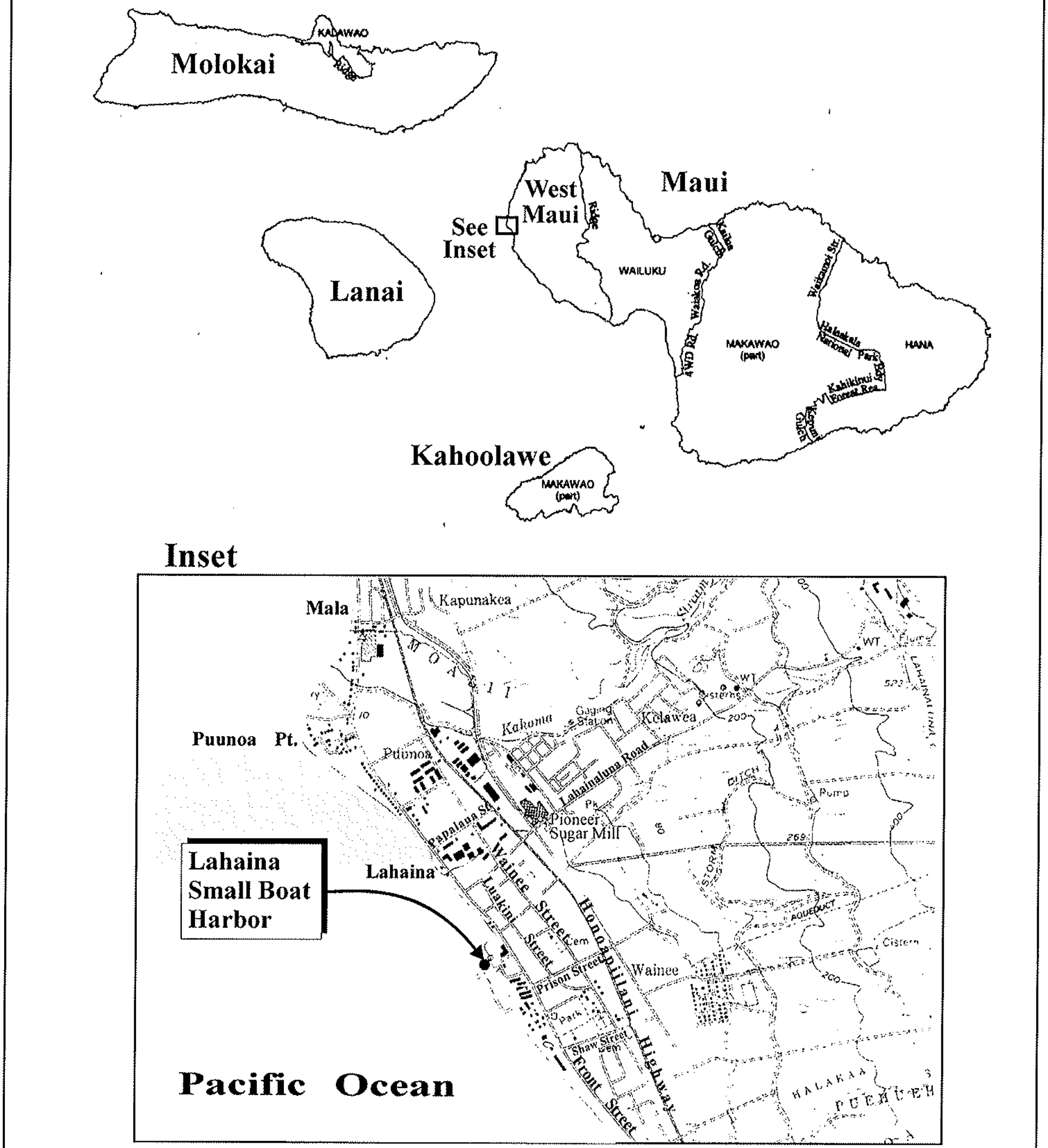
1.1 PLANNING CONTEXT AND RELEVANT PLANNING RESULTS

The State of Hawai`i recognizes that the existing commuter ferry operations from the islands of Lana`i and Moloka`i to the island of Maui are vital to the economic and social well-being of the County of Maui and to the State. See **Figure 1**.

Since the late 1980s, interisland ferry service between Lana`i and Maui, as well as Moloka`i and Maui, has been provided by private operators through permits with the DLNR. Presently, the Lana`i/Maui ferry, operated by Hono Heke Corporation (Expeditions), schedules five (5) daily round trips between the Lahaina (LSBH) and Manele Small Boat Harbors, seven (7) days per week. The Moloka`i/Maui ferry, operated by Sea Link of Hawai`i, schedules two (2) round trips a day between the LSBH and the Kaunakakai Commercial/Small Boat Harbor seven (7) days per week.

Previously, commuter transportation between the islands was to a large extent carried out by regularly scheduled air travel. Interisland flights were numerous, convenient, and affordable. However, since the tragic events of September 11, 2001 (9/11), direct commuter air transportation service between Maui and Lana`i and Maui and Moloka`i by the two (2) main airlines in Hawai`i has been severely cut back and many flights have been discontinued. Currently, a one-way flight between Maui and Lana`i with a stopover on O`ahu, involves a total air and ground time of about 3 hours and 30 minutes and costs approximately $180.00. Expeditions Ferry's scheduled route between the LSBH on the island of Maui and Manele Small Boat Harbor on the island of Lana`i takes approximately 45 minutes and costs as little as $16.67 for adult Hawai`i residents. A one-way flight between Maui and Moloka`i with a stopover on O`ahu, involves a total air and ground time of about 3 hours, and costs approximately $180.00. The Sea Link of Hawai`i's scheduled ferry route between the LSBH and the Kaunakakai Commercial Harbor on the island of Moloka`i takes approximately 1 hour and 30 minutes and can cost as little as $32.68 for adult Hawai`i residents.

In light of the declining level of air service between the islands of Maui, Lana`i, and Moloka`i, coupled with the increased travel times and fares, the demand for the interisland ferry services is anticipated to increase in the future. In 2004, ferry passenger travel between Maui and Lana`i totaled 144,635 one-way trips. Of the total trips, 65 percent were commuter



Source: County of Maui, Data Book, 2003 and
U.S. Geological Service, Lahaina Quad Map

Figure 1 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Regional Location Map

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/regional

trips and 35 percent were tourist trips. In 2004, the most recent figures for the Maui and Moloka`i scheduled route, ferry passenger travel totaled 43,000 one-way trips. Of the total Maui/Moloka`i trips, 44 percent were by commuters and 56 percent were by tourists. The interisland ferry operations provide an affordable transportation alternative. It allows access to a greater range of employment opportunities, and government, health, recreational, and educational services. It also allows family relationships and social/cultural interactions to be maintained.

1.2 NEED FOR TRANSPORTATION IMPROVEMENTS

Existing interisland ferry facilities on Maui are located at the LSBH. The facility is owned by the State of Hawai`i, Department of Land and Natural Resources. The LSBH is located in Lahaina Town on the west coast of Maui. It is the only ferry docking facility in West Maui. See **Figure 2**. The existing pier at the LSBH is the only transportation hub on Maui for the two (2) interisland ferry service providers, Expeditions Ferry and Sea Links of Hawai`i, that provide ferry services to the islands of Lana`i and Moloka`i, respectively. The ferry service provides an affordable interisland transportation mode for the predominately minority and low income communities on the islands of Lana`i and Moloka`i to gain access to employment, government, health services, education, shopping, and recreational opportunities on the island of Maui.

Geographic conditions make LSBH an ideal harbor site. Lahaina is protected from the predominant tradewinds by the West Maui Mountains, and shielded from the tradewind-generated waves by the island mass. The off-shore waters of Lahaina are partially protected from the North Pacific swell and summer southern swell by the islands of Lana`i and Moloka`i. As a result of the protected off-shore waters, Lahaina became a good anchorage and an important port for whaling ships in the early 1820's. A total of 549 whaling ships landed in Lahaina in 1854. A wharf was constructed at the site of the present pier in the early 1800's. A breakwater to protect the harbor basin was constructed in the 1950's. The harbor basin and entrance channel were dredged in the 1970's to create more berthing area within the harbor and deepen the harbor entrance.

The historic character of Lahaina Town was developed during the whaling ship and pioneer era from 1800 to 1850. Identification of predominant landmarks of this era gave rise to the designation of the Lahaina National Historic Landmark District by the Advisory Council on Historic Preservation. This historic district covers an area of approximately 33 acres of land

Source: Department of Land and Natural Resources

Figure 2

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Lahaina Small Boat Harbor

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Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

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in the center of Lahaina Town and extends a mile over the ocean in front of Lahaina Town. The LSBH is located within the Lahaina National Historic Landmark District boundaries.

The existing pier contains the harbor master's office, a ferry kiosk, a fish hoist, and fuel dispensing, sewage pump out and docking facilities. It is used for loading and unloading passengers onto recreational and commercial vessels, including the interisland ferries, cruise ship tenders, and tour/dive boats. The sewer pump out facility is the only one on the Westside of Maui. The existing pier, used by the interisland ferries at the LSBH, is unable to efficiently and safely support the current level and anticipated future level of usage. In addition to the ferry traffic, LSBH is home port to 47 commercial vessels and approximately 71 recreational vessels. It is one of the busiest harbors in the State of Hawai`i. In addition to the use of the pier by the existing interisland ferry operators, the pier is also used by the commercial boat operators to load and unload passengers, to fuel, to pump out sewage, and to hoist fish. During boat days when cruise ships anchor outside the LSBH, the tenders use the pier continuously from 8:00 a.m. to 10:00 p.m. During busy times, although the interisland ferry operators have preferential access to the pier, the ferries nevertheless, are forced to wait in the entrance channel until the existing pier becomes available, thereby exposing the ferry passengers to discomfort due to sea sickness and potential danger during rough ocean conditions. Also, these delays negatively impact the scheduled arrival and/or departure times, which are regulated by the Public Utilities Commission. In addition, the added security requirements for cruise ships have created additional delays and/or inconveniences for the ferry operators and their passengers.

2. ALTERNATIVES CONSIDERED

2. ALTERNATIVES CONSIDERED

2.1 SCREENING AND SCOPING OF ALTERNATIVES

The DLNR, Division of Boating and Ocean Recreation assessed 14 non-structural alternatives to mitigate safety concerns at the LSBH. A non-structural alternative is defined as a course of action that does not involve construction to physically alter the facility. The assessment of these alternatives included programmatic and operational scheduling considerations. The assessment of the non-structural alternatives is summarized in **Table 1**, below.

Table1. Summary of Non-Structural Alternative Assessment

No.	Non-structural Alternative	Impact on existing pier use	Comments
1.	Require 6-passenger charter boats to utilize open slips (unoccupied berths) to load and unload passengers instead of using the existing pier.	Nominal	Not enforceable. Conflicts with HAR §13-231-17 (a) "A vessel, contrivance or material shall not be moored, anchored, or stored at a small boat harbor, offshore mooring or space other than that to which it was properly assigned". Customers could have a difficult time finding the charter boat, as the boat moves location based on available berth (dock) space. There may be conflicts, as berths are assigned to a regular permit holder and is for the exclusive use of the permit holder.
2.	Require all commercial vessels moored in the Lahaina SBH to load and unload passengers from the assigned berth instead of using the existing pier.	Nominal	Not enforceable. HAR §13-231-86 (d) lahaina boat harbor, C. "Commercial vessels holding valid mooring permits within Lahaina boat harbor shall load and unload passengers from the assigned berth, unless other wise authorized by the department to load and unload passengers from the loading dock." The physical constraints of the harbor facilities may preclude the use of the assigned berth to load and unload passengers safely and efficiently. May require substantial improvements to dock and landside facilities.
3.	Get rid of assigned berths within the Lahaina SBH and designate all of the berths as "unassigned berths" as defined by HAR §13-230-9 <u>Definitions.</u> This will allow the vessels with Use Permits for berths at Lahaina SBH to dock anywhere with the harbor based on space availability.	Nominal	Not enforceable. Conflicts with HAR §13-231-17 (a) "A vessel, contrivance or material shall not be moored, anchored, or stored at a small boat harbor, offshore mooring or space other than that to which it was properly assigned". Not feasible because each berth and vessel presents unique ship handling and other peculiar berthing problems in relation to the harbor. Accordingly, the Harbor Agents assign berths based on vessel length, draft, beam, method of propulsion and use in relation to the size of the berth, berth location, water depth, prevailing winds and currents. Also, it would be difficult for the Harbor Agents to regulate and manage the harbor. There will be likely conflicts among harbor users. Customers could have a difficult time finding the charter boat, as the boat moves location based on available berth (dock) space.

Table 1 (Continue). Summary of Non-Structural Alternative Assessment

4.	Non-renewal of use permits to reduce the number vessel berthing spaces in the Lahaina SBH	Nominal	Conflicts with DOBOR goals and DOBOR general statement, "Berths in the state small boat harbors and offshore mooring areas shall be used to accommodate recreational and commercial boats used for water transportation or fishing." Also, conflicts with DOBOR general policy governing the allocation of berths, HAR §13-231-80 (b) "It is the policy of the department to promptly assign an available berth on a first-come, first-served basis to the first qualified applicant, determined in accordance with the provisions of this subchapter…..". There are applicants for assigned berths at the Lahaina SBH that have been on the list for over 25 years. Restricting and/or eliminating available berthing space at the Lahaina SBH will likely result in litigation against the State.
5.	Restricting and/or eliminating off-shore mooring outside of the Lahaina SBH.	Nominal	Conflicts with DOBOR goals and DOBOR general statement, §13-231-1 (a) "Berths in the state small boat harbors and offshore mooring areas shall be used to accommodate recreational and commercial boats used for water transportation or fishing." Also, conflicts with State of Hawai`i and DOBOR "free port" policy of making government facilities available for use by the public.
6.	Restricting vessels from entering the harbor during busy times.	Nominal	May be feasible but not desirable, as vessels are forced to wait outside of the harbor entrance channel until the existing pier becomes available, thereby exposing the passengers to discomfort due to sea sickness and potential danger during rough ocean conditions. May not be effective as the existing pier is already unable to efficiently and safely support the current usage and there are no other pier facilities to direct the vessels to during busy times.
7.	Eliminate sewer pump out facility on the existing pier.	Moderate	Vessels will likely discharge untreated waste water into the ocean. State law requires vessels to discharge waste water three miles offshore. However, since this is not enforceable there are reports of vessels discharging within three mile from shore. The untreated waste water may impact marine organisms and nearshore water quality. Also, the discharge of untreated waste water into the ocean conflicts with State Department of Health, U.S. Coast Guard and U.S. Environmental Protection Agency policies and/or guidelines.
8.	Eliminate fuel dispensing facilities on the existing pier.	Moderate	Currently Valley Automated Fuels dba Pacific West has a contract with the State to provide fuel at the Lahaina Small Boat Harbor. The cancellation of this contract would likely subject the State to claims by the vendor, as the vendor has installed the fuel tank and fuel dispensing system at their own expense. Also, this would seriously impact the operations of the vessels moored in and outside of the Lahiana SBH , off of Ka`anapali Beach and vessels operating out of Mala Boat Ramp that fuel at the Lahaina SBH. The fueling facility at the Lahaina SBH is the only facility on the West side of Maui. Vessels would need to go to Ma`alaea SBH (Maui) or Manele SBH (Lana`i) to purchase fuel from a tanker truck. The smaller boats would need to use portable fuel dispensers to fuel their tanks. This can pose a serious safety hazard and potential for fuel discharge into the ocean.
9.	Regulate the number and frequency of cruise ship visits to the Lahaina SBH.	Moderate	Conflicts with Federal Interstate Commerce Rules and State policy which does not allow public facilities (harbor ports) to be unreasonable withheld from use. Also, conflicts with DOBOR policy to provide access to port facilities if space is available. Cruise ships have scheduled stops at the Lahaina SBH up to 2010. The Lahaina SBH is the only harbor facility in West Maui. The reduction of cruise ship visits to the Lahaina SBH will have a negative economic impact on Lahaina, Maui County and the State of Hawai`i.

Table 1 (Continue). Summary of Non-Structural Alternative Assessment

10.	Regulate the number and frequency of cruise ship tenders the use the existing pier.	Moderate	The number of tender vessels is typically dictated by the number of passengers and crew on the cruise ship. The limitation of the number and/or frequency of cruise ship tenders which are allowed to use the existing pier would force passengers and crew to wait on the ship and/or at the harbor. This could create a safety hazard onshore because there are no covered waiting facilities available to protect the cruise ship passengers from the intense sun. Also, it may force the tenders to wait in the entrance channel until they are allowed to use the existing pier, thereby exposing the passengers to discomfort due to sea sickness and potential danger during rough ocean conditions.
11.	Enforce 30 minute time limit for docking on the existing pier.	Minor	DOBOR does not have enforcement authority, nor do they have the personnel to monitor and enforce the 30 minute time limit. Also, DOCARE, which does have enforcement authority does not have the personnel to enforce the 30 minute time limit. However, during busy times the Harbor Agents try to enforce the 30 minute time limit.
12.	Designate time and pier location for the two ferry operations.	Minor	Not enforceable or feasible, as the existing pier is operating well beyond the safe operating capacity and there are no comparable docking facilities for non-ferry vessels to be moved to. Also, this does not promote efficient us of the limited pier facilities, especially when the ferry vessels may be delayed due to equipment malfunctions or inclement weather or adverse ocean conditions. The Harbor Agents try to provide preferential docking whenever possible in order to maintain the PUC regulated ferry schedules.
13.	Use "face" West or Makai side of the existing pier for vessel docking at the sole discretion of the harbor personnel.	Moderate	Allowable by rules but unsafe during unfavorable weather/ocean conditions. The use of the Makai pier face as a loading dock is regulated by HAR §13-231-46 <u>Vessel Limitation</u>. "Due to the restricted entrance and turning area in Lahaina small boat harbor, No vessel of any size will be allowed to moor on the makai side of the Lahaina loading (fuel) dock from sunset to sunrise. Mooring from sunrise to sunset will be limited to fifteen minutes." The use of this pier face interferes with the only access to the harbor, as the docking vessels blocks nearly half of the entrance channel to the harbor. The entrance channel by current design standards is already too narrow to accommodate the multi-hull vessels that are docked in Lahaina SBH. The typical minimum entrance channel width for small craft is 4 to 5 times the beam width of the widest boat. The Moloka'i Princess and Expeditions IV have beam width of 24 feet. The existing channel is less than 90 feet which is less than the 96 to 120 feet recommended entrance channel width.
14.	Mandatory scheduling for all commercial vessels using the loading dock.	Moderate	Not enforceable. Scheduling would be very complicated and potential conflicts between boaters could occur during busy times. May preclude the use of the existing pier by recreational and transient vessels when pier is "reserved" by the commercial vessels. Will require ongoing monitoring by Harbor Agents and DOCARE officers. The implementation of this alternative does not promote efficient us of the limited pier facilities. Flexible scheduling at the discretion of the Harbor Agents is needed to maximize the use of the existing pier.

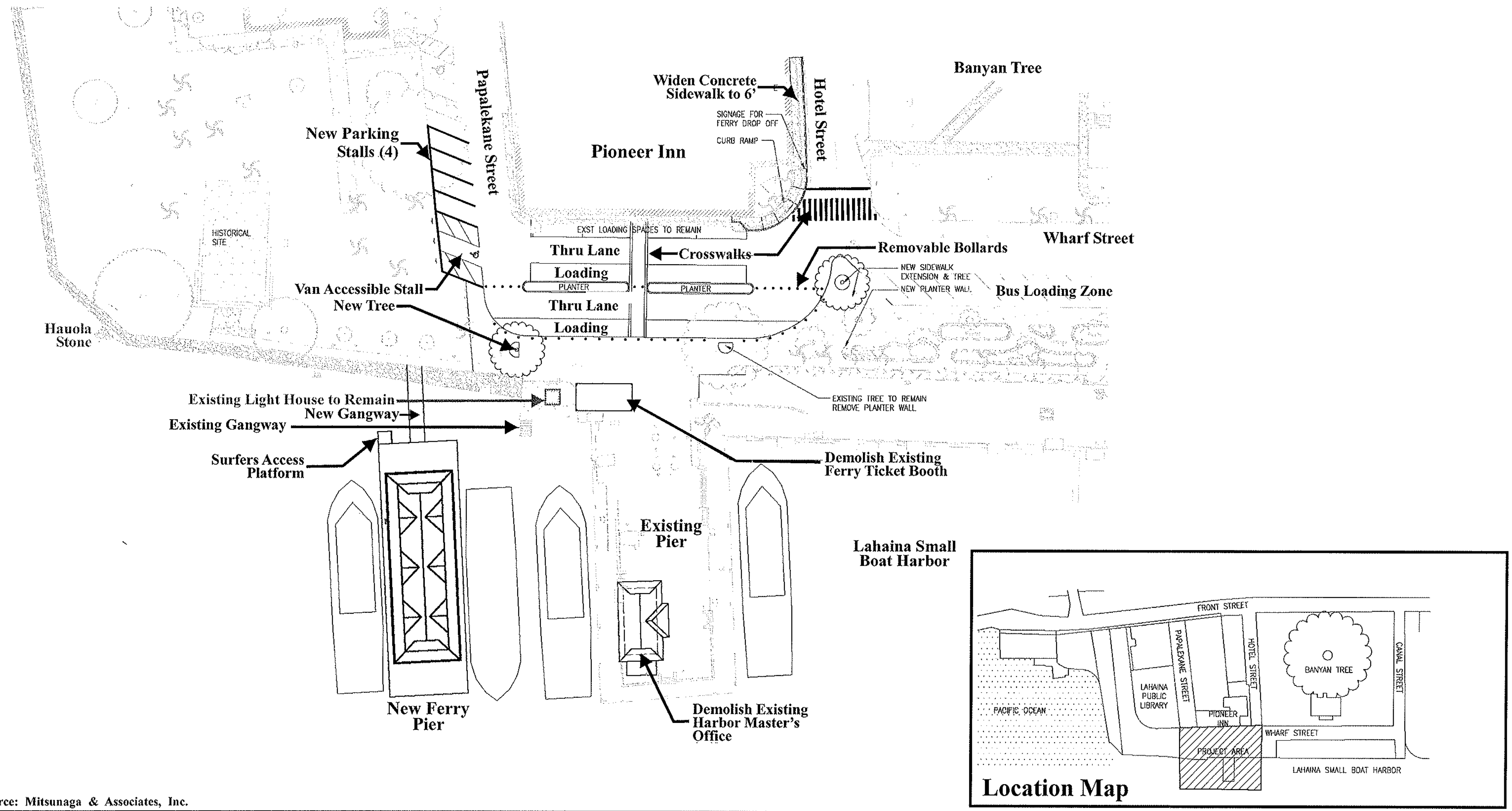
In summary, assessment of the non-structural alternatives was considered to have nominal impact on existing pier use and would require administrative rule changes prior to implementation. Non-structural Alternatives 1 through 6, conflicted with current State administrative rules and regulations. Elimination of harbor facilities, such as sewer pump-out stations and fuel pumps (non-structural Alternatives 7 and 8, respectively) were considered to have moderate impact on existing pier use and could potentially have adverse environmental or legal consequences. Regulating the number of cruise ships to Lahaina (non-structural Alternative 10) would have moderate impact on existing pier use, but, conflicts with Federal Interstate Commerce Rules and State policy. Enforcement of time limits or designated times on pier use (non-structural Alternatives 11, 12 and 14) would have minor impact on pier use, but are not enforceable due to existing State rules and regulations. Use of the west side of the existing pier (non-structural Alternative 13) would have moderate impact on pier use, but would be unsafe during unfavorable weather/ocean conditions. In consideration of the above, the non-structural alternatives were not considered to be effective in meeting the purpose and needs at the LSBH.

2.2 DEFINITION OF ALTERNATIVES

The proposed ferry pier improvements are located within the LSBH and on the adjacent Wharf Street, Hotel Street and Papalekane Street fronting the existing pier. In total, four (4) alternatives, including three (3) structural and one (1) no-build alternative were considered. See **Appendix "A"**. The alternatives are summarized as follows.

2.2.1 ALTERNATIVE 1: INDEPENDENT PIER AND TWO-STORY FERRY BUILDING

The proposed independent pier and two-story ferry building alternative is located approximately 60 feet to the north of the existing pier. See **Figure 3** and **Figure 4**. The new pier would consist of a concrete and sheet pile system structure that will be 35 feet in width and 115 feet in length. The new ferry pier would be of similar construction to the existing pier and at approximately the same elevation of the lower loading area. A concrete walkway (16 ft. width X 35 ft. length) would provide pedestrian access between the shoreline and new ferry pier. The concrete walkway would be connected to a new landside concrete bulkhead on the mauka (shore side) of the existing seawall and to the new ferry pier. The walkway would bridge over the existing seawall and ocean below. No pilings and/or intermediate supports for the walkway will be placed in the water. A two-story building (32 ft. in height) would be constructed on the new ferry pier. The ground floor will include a little over 4,000 square feet of open area for passenger arrivals and departures, while the second floor would contain a total interior floor area of approximately 2,000 square feet, which includes public restrooms, a janitor's closet, a wrap-around deck, concession space, and administration and ferry offices. Stairs and an elevator will provide pedestrian access between both levels. Auxiliary improvements would consist of installing two (2) sewage pump-out stations, hose bibs, security lighting, water/sewer utilities, and a small floating platform with a movable gangway (surfer access) on the new ferry pier.



Source: Mitsunaga & Associates, Inc.

Figure 3

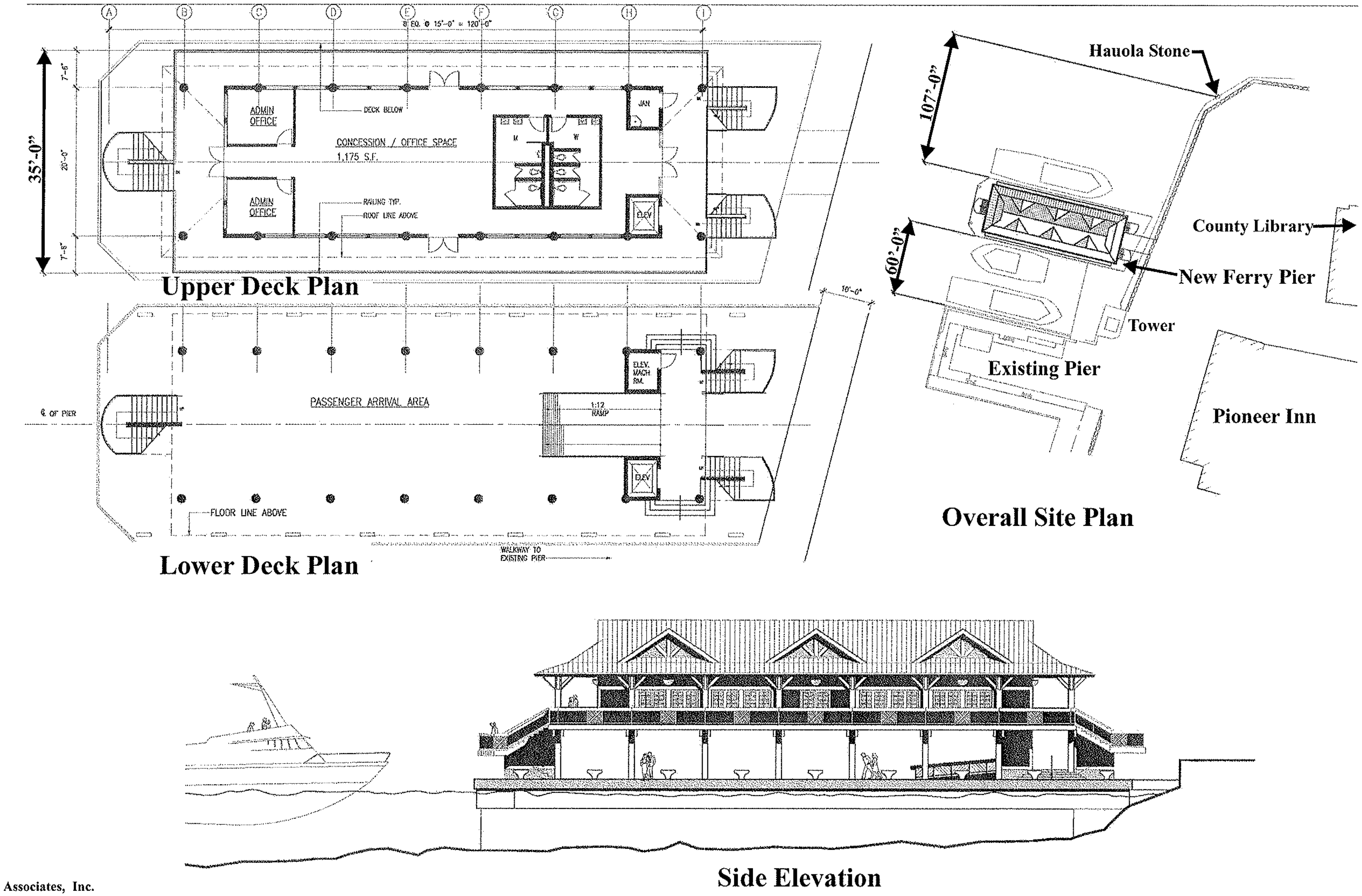
Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Alternative No. 1: Independent Pier and Two Story Ferry Building Site Plan

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/SitePlan



Source: Mitsunaga & Associates, Inc.

Figure 4

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Alternative No. 1: Independent Pier and Two Story Ferry Building Floor Plans and Elevation

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/floorplanelev

Landside improvements would consists of the resurfacing of Wharf Street between Hotel and Papalekane Streets; relocating four (4) existing parking stalls and installing four (4) new stalls on the north side of Papalekane Street; widening the sidewalk along the northwestern portion of Hotel Street; demolishing the existing Administrative Office (Harbor Master's Office) and Ferry Ticket Booth. Refer to **Figure 4**.

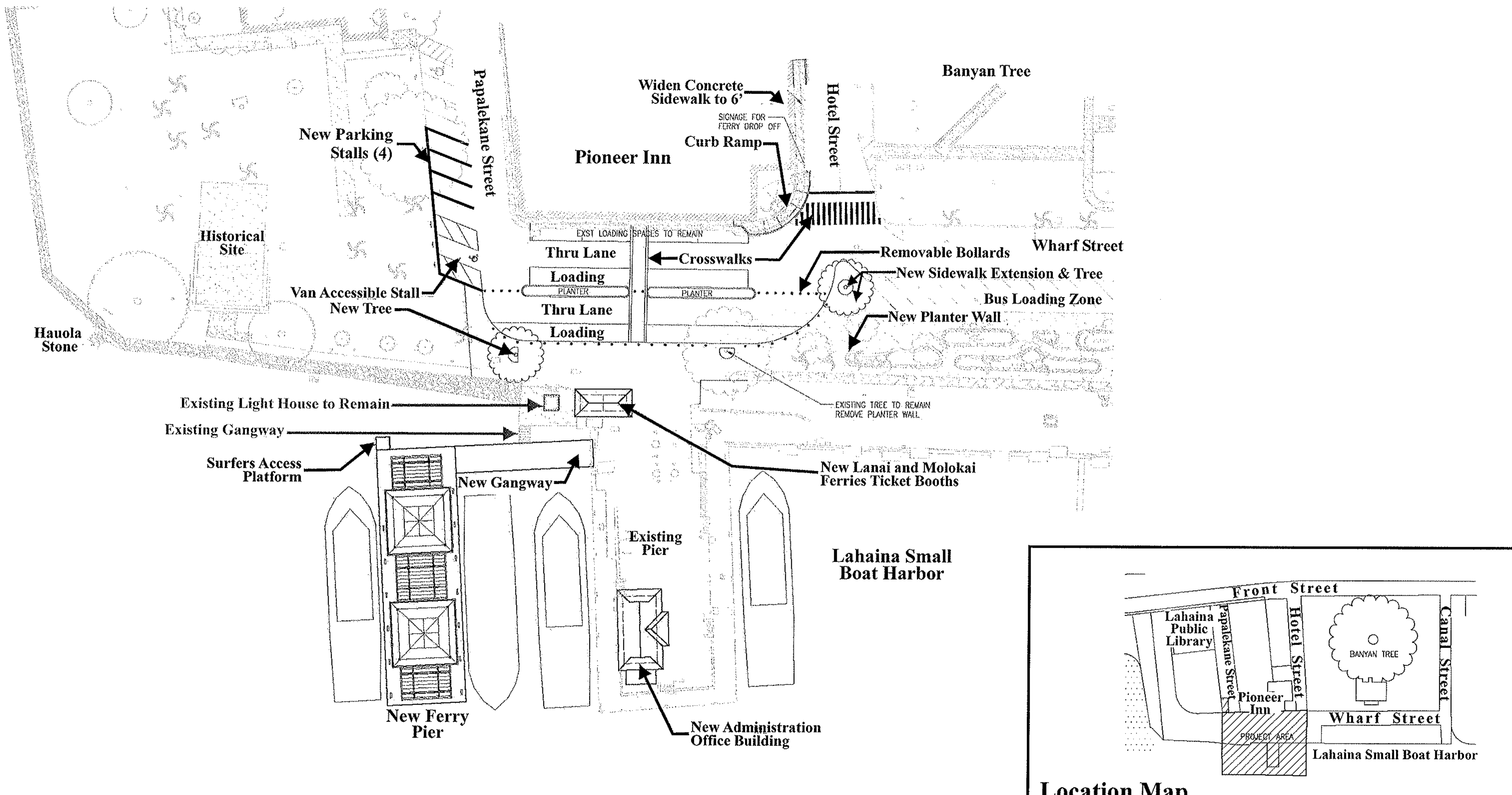
New dredging of the berthing area and entrance channel to -13 feet msl would be required.

Construction cost estimate for Alternative 1 is estimated to be approximately $8.8 million. See **Appendix "A-1"**.

A configuration with a slightly larger ferry pier and two-story ferry building with an attached multi-use pier (15 ft. width X 90 ft. length) was presented to the April 8, 2004 Stakeholders meeting and December 8, 2004 EIS Scoping meeting. The larger pier alternative was rejected by the Stakeholders and public due to impacts to the adjacent coral reef, Lahaina Historic Landmark District, and view planes from the park and Pioneer Inn.

2.2.2 ALTERNATIVE 2: ATTACHED SHEET PILE FERRY PIER AND SINGLE-STORY SHADE STRUCTURE

The proposed attached sheet pile pier is located approximately 60 feet to the north of the existing pier. See **Figure 5** and **Figure 6**. The new pier would consist of a concrete and sheet pile system structure that will be 35 feet in width and 115 feet in length. The new ferry pier would be of similar construction to the existing pier and at approximately the same elevation of the lower loading area. A concrete walkway (16 ft. width X 60 ft. length) would provide pedestrian access between the existing and new ferry pier. The walkway would be supported by concrete foundation piles embedded in the ocean bottom. Two (2) low-rise, open sided, roofed structures (16



Source: Mitsunaga & Associates, Inc.

Figure 5

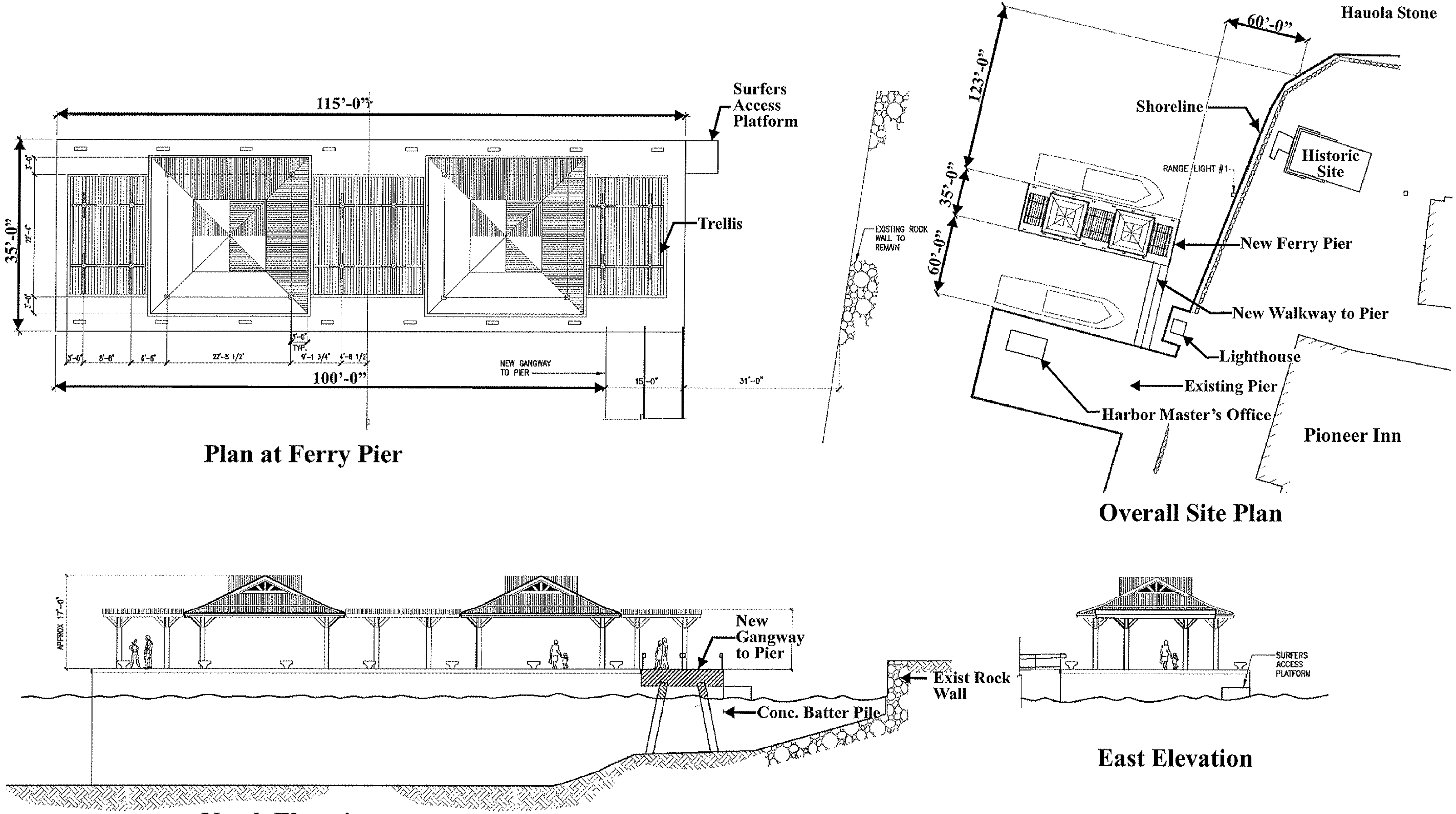
Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Alternative No. 2: Attached Sheet Pile Ferry Pier and Single-Story Shade Structure Site Plan

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/shadestrucplan



Source: Mitsunaga & Associates, Inc.

Figure 6

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Alternative No. 2: Attached Sheet Pile Ferry Pier and Single-Story Shade Structure Plan and Elevation

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/alt2planelev

ft. in height) connected by an open trellis will provide full and/or partial cover over the approximately 4,000 square foot ferry pier for passenger arrivals and departures. Auxiliary improvements would consists of installing two (2) sewage pump-out stations, hose bibs, security lighting, water/sewer utilities and a small floating platform with a movable gangway (surfer access) on the new ferry pier.

Landside improvements would consist of replacing the existing Administration Office (Harbor Master's Office) and Ferry Ticket booth; resurfacing of Wharf Street between Hotel and Papalekane Streets; relocating four (4) existing parking stalls and installing four (4) new stalls on the north side of Papalekane Street; and widening the sidewalk along the northwestern portion of Hotel Street. Refer to **Figure 5**.

Maintenance and new dredging of the berthing area and entrance channel to -13 feet would also be required.

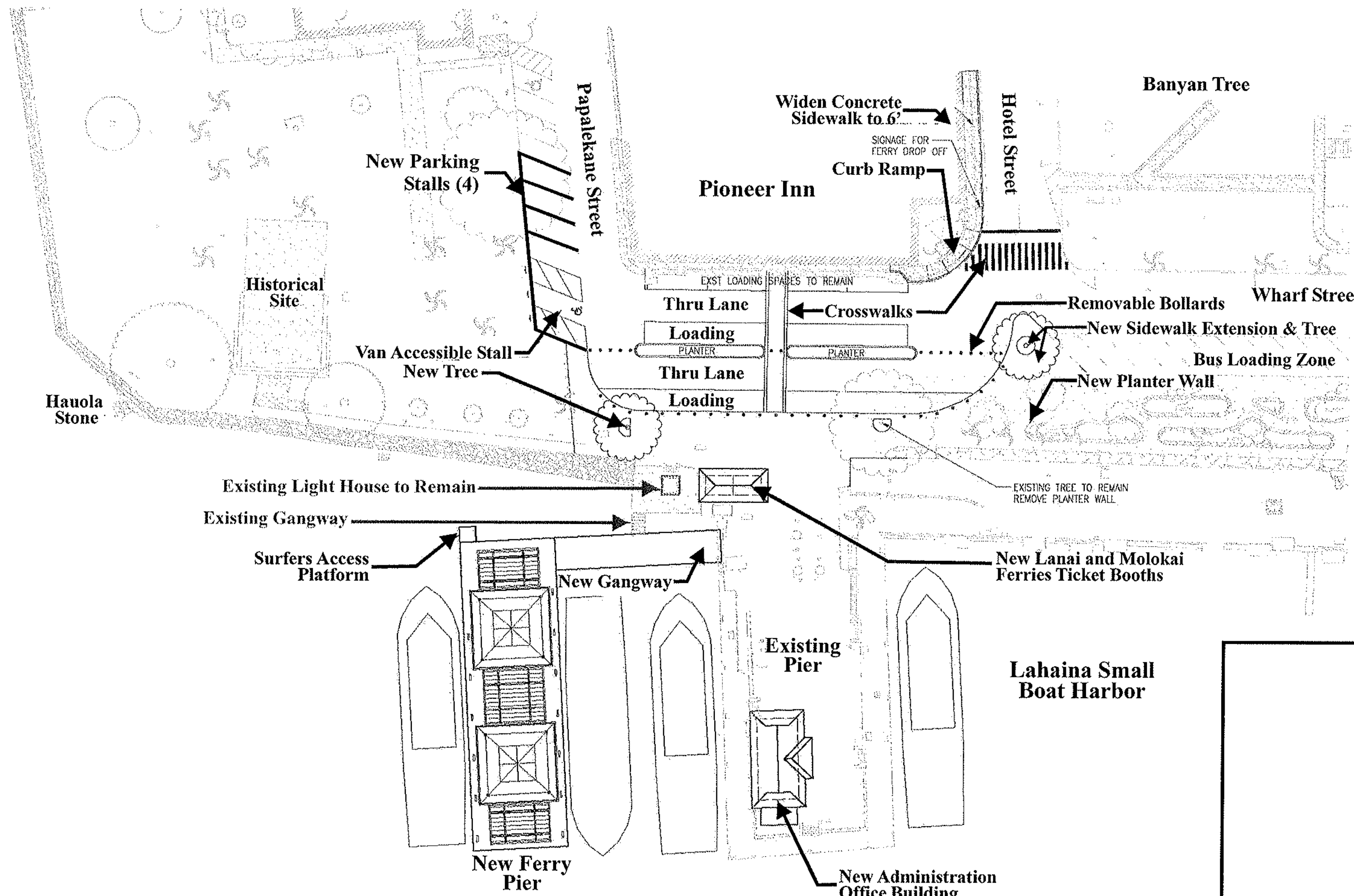
Construction cost for Alternative 2 is estimated to be approximately $7.7 million. Refer to **Appendix "A-1"**.

2.2.3 ALTERNATIVE 3: ATTACHED PILE SUPPORTED FERRY PIER AND SINGLE-STORY SHADE STRUCTURE

The proposed attached pile supported pier is located approximately 60 feet to the north of the existing pier. See **Figure 7** and **Figure 8**. The new pier would consist of a concrete structure and supported by concrete foundation piles (that will be 35 feet in width and 115 feet in length). A concrete walkway (16 ft. width X 60 ft. length) would provide pedestrian access between the existing and new ferry pier. The walkway would be supported by concrete foundation piles embedded in the ocean bottom. Two (2) low-rise, open sided, roofed structures (16 ft. in height) connected by an open trellis will provide full and/or partial cover over the approximately 4,000 square foot ferry pier for passenger arrivals and departures.

Auxiliary improvements would consist of installing two (2) sewage pump-out stations, hose bibs, security lighting, water/sewer utilities and a small floating platform with a movable gangway (surfer access) on the new ferry pier.

Landside improvements would consist of replacing the existing Administration Office (Harbor Master's Office) and Ferry Ticket booth; resurfacing of Wharf Street between Hotel and Papalekane Streets; relocating four (4) existing parking stalls and



Source: Mitsunaga & Associates, Inc.

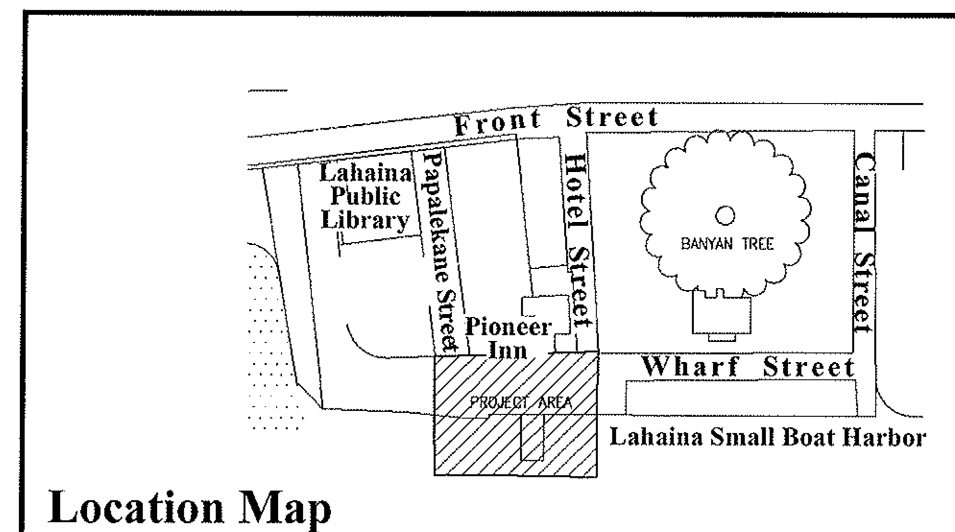


Figure 7

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

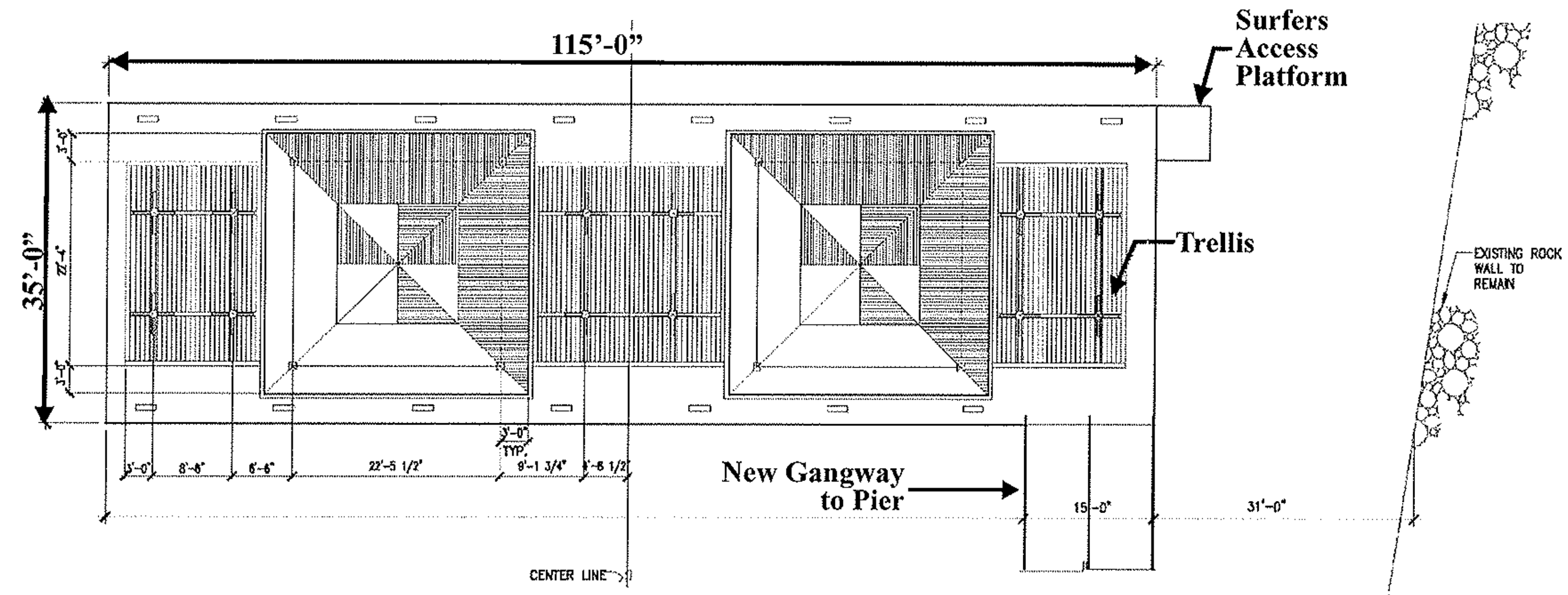
Alternative No. 3: Attached Pile Supported Ferry Pier and Single-Story Shade Structure Site Plan

NOT TO SCALE

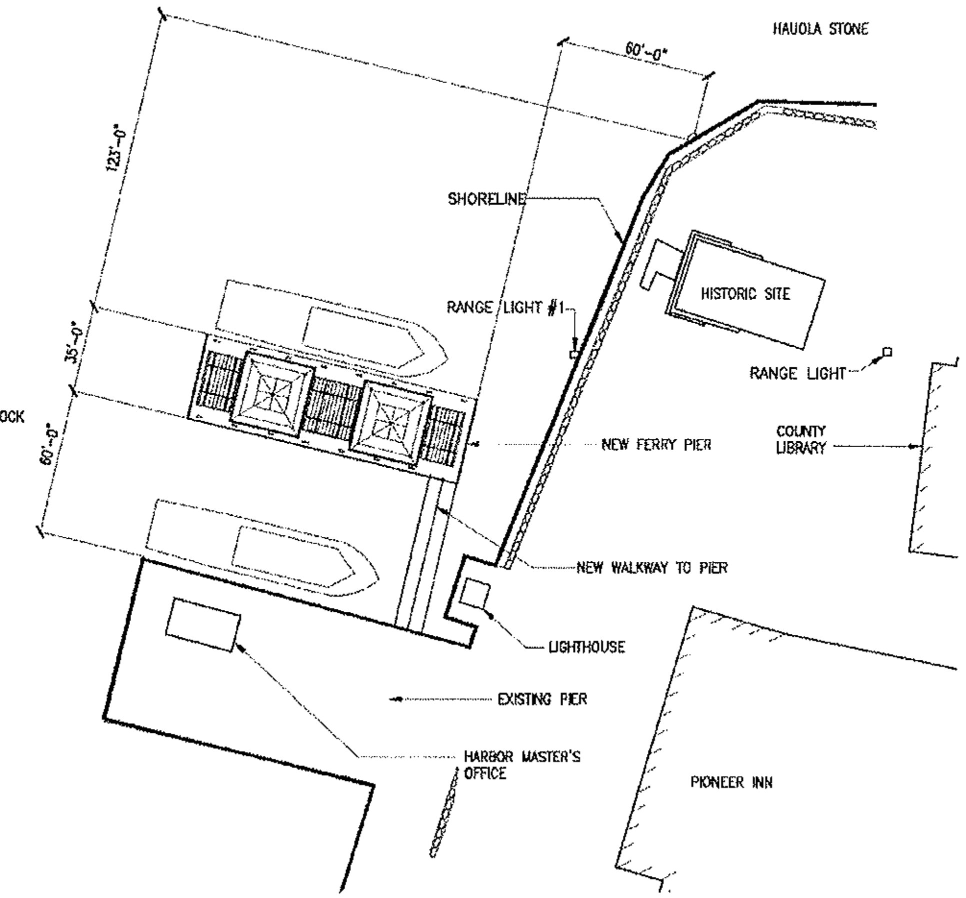
Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

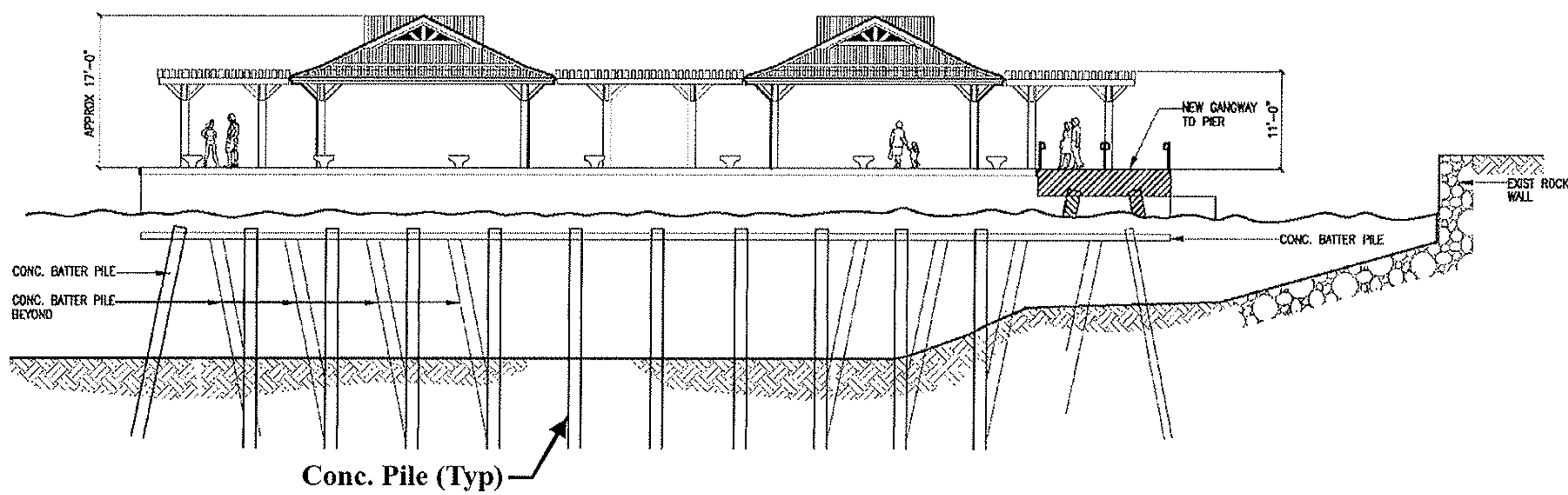
MAI/LhnPier/DEIS/alt3shadesiteplan



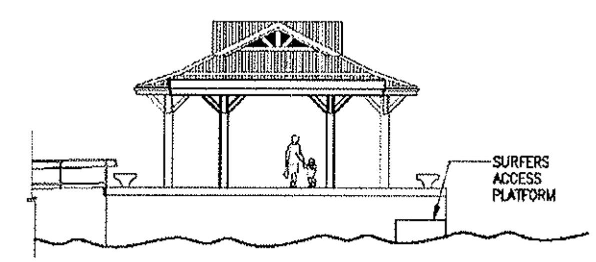
Plan at Ferry Pier



Overall Site Plan



North Elevation



East Elevation

Source: Mitsunaga & Associates, Inc.

Figure 8

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Alternative No. 3: Attached Pile Supported Ferry Pier and Single-Story Shade Structure

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/alt3shadestruc

installing four (4) new stalls on the north side of Papalekane Street; widening the sidewalk along the Northwestern portion of Hotel Street. Refer to **Figure 9**.

Maintenance and new dredging of the berthing area and entrance channel to -13 feet would be required.

Construction cost estimate for Alternative 3 is estimated to be approximately $8.3 million.

2.2.4 ALTERNATIVE NO. 4: NO ACTION

In addition to maintaining present physical conditions, the "no action" alternative would retain existing operating conditions and levels of service at the LSBH. This alternative would leave the harbor as is, without any improvements for the interisland ferry. The "no action" alternative would meet none of the identified State project purposes or address the safety and operational issues identified at the LSBH.

2.3 FUNDING SOURCES

This project will be funded by Section 319 of the U.S. Department of Transportation appropriations pursuant to 49 USC 5309-Capital Grants and Loans and the State of Hawai`i Legislature. The project cost-sharing breakdown is typically 80 percent Federal to 20 percent State. Planning costs for the LSBH interisland ferry pier improvements have been approved with $280,000.00 in Federal funds and the required match of $56,000.00 in State funds. It is anticipated that the planning phase of the proposed improvements will be completed by June 30, 2008. The project design phase is anticipated to commence in January 2009 and completed in December 2009. Project design is anticipated to cost $1.1 million. Construction is anticipated to commence in June 2010 and completed by July 2011. Construction of the proposed project is estimated to cost $8.3 million.

The State share of the project has been approved by the State Legislature (SLH 2007, Item H 15.299D). The State share of design and construction funding do not lapse. The State design funding will be available July 1, 2007. The Federal design and construction funding is anticipated to be available, pending FTA grant approval in September 2008 for design and June 2010 for construction.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 NEIGHBORHOODS AND COMMUNITIES

3.1.1 Affected Environment

The project area is situated along the western extent of Lahaina's business district. Numerous retail stores and services are located along Front Street, the major venue for commercial activity in Lahaina Town. To the south of the project area lies 505 Front Street, a two-story, 75,000 square foot shopping center, while to the north lies a myriad of visitor-oriented shops and restaurants, as well as shopping facilities such as the Banyan Inn Market Place, The Wharf Cinema Center, Dickenson Square, Lahaina Market Place, Mariner's Alley, Lahaina Shopping Center, Lahaina Square, Anchor Square, Lahaina Center, and Lahaina Cannery Mall.

The proposed project area is located in an area of existing park, business/commercial, and public/quasi-public land uses. The LSBH lies south of the proposed project area, while the Lahaina Public Library and the Pioneer Inn are located to the east. Various retail shops lie along Pioneer Inn's frontage with Hotel, Wharf, and Front Streets. The Lahaina Courthouse lies along the east side of Wharf Street, while the King Kamehameha III Elementary School is south of and adjacent to Canal Street. A grassed, open space area on the west side of the Lahaina Public Library and the Courthouse Park, which encompasses the Banyan Tree and existing comfort station parcels, characterize park uses in the area. In addition to the Pioneer Inn and the Banyan Tree, historic sites such as the Hauola Stone and the Brick Palace occupy lands in the project area. East of Front Street, land uses in the project area include the Banyan Inn Market Place, The Wharf Cinema Center and a host of retail stores, as well as scores of single-family residences.

3.1.2 Environmental Consequences

The proposed alternative ferry pier improvements will complement existing, established uses at the LSBH. However, from a land use perspective, each project alternative will have varying degrees of consequences with surrounding land uses in the area.

Alternative 1: The walkway accessing the pier will be connected to the harbor bulkhead. The view of the historic seawall along the harbor bulkhead may be obstructed by the placement of the access ramp. The size of the two-story ferry building will alter the historic character of Lahaina Town and obstruct ocean views from adjacent upland uses.

Alternative 2: Access to the new pier will be provided by a walkway from the existing pier. Therefore, the historic seawall will not be affected. The single-story shade structure will obstruct some ocean views, however, it will be low and open sided to allow views to the ocean over and through the structure. The style of the roof, administration office and ferry ticket booth will be designed to reflect the historic character of Lahaina Town.

Alternative 3: Alternative 3 will have similar environmental consequences on community character as Alternative 2. In addition, the open area underneath the new pier deck would allow more of the ocean water to be viewed from adjacent land uses.

Alternative 4: Alternative 4 would maintain existing conditions at the LSBH. The overcrowding and congestion at the harbor will continue to adversely impact operational efficiencies.

3.2 LAND USE ZONING AND ECONOMIC DEVELOPMENT

3.2.1 Affected Environment

3.2.1.1 State Land Use Districts

Pursuant to Chapter 205A, Hawai`i Revised Statutes, all lands in the State have been divided and placed into one (1) of four (4) land use districts by the State Land Use Commission. These land use districts have been designated "Urban", "Rural", "Agricultural", and "Conservation". See **Figure 9**. The proposed ferry pier will involve work in areas occupied by the former berth for the Carthaginian II (TMK 4-6-01:14), the existing harbor pier (TMK 4-6-01:17), the waters of the LSBH (TMK 4-6-01:02), and work in the County rights-of-way on Wharf and Hotel Streets and State owned Papalekane Street. TMK Parcels 02 and 17 are partly in the Urban district and waters of the State of Hawai`i which fall within the Conservation district. The County and State rights-of-way are in the Urban district.

3.2.2 Environmental Consequences

3.2.2.1 State Land Use Districts

The portions of LSBH development alternatives, which are located within the State Urban district, are deemed permissible within the State Urban district. Each alternative is assessed in relation to the urban district uses as follows.

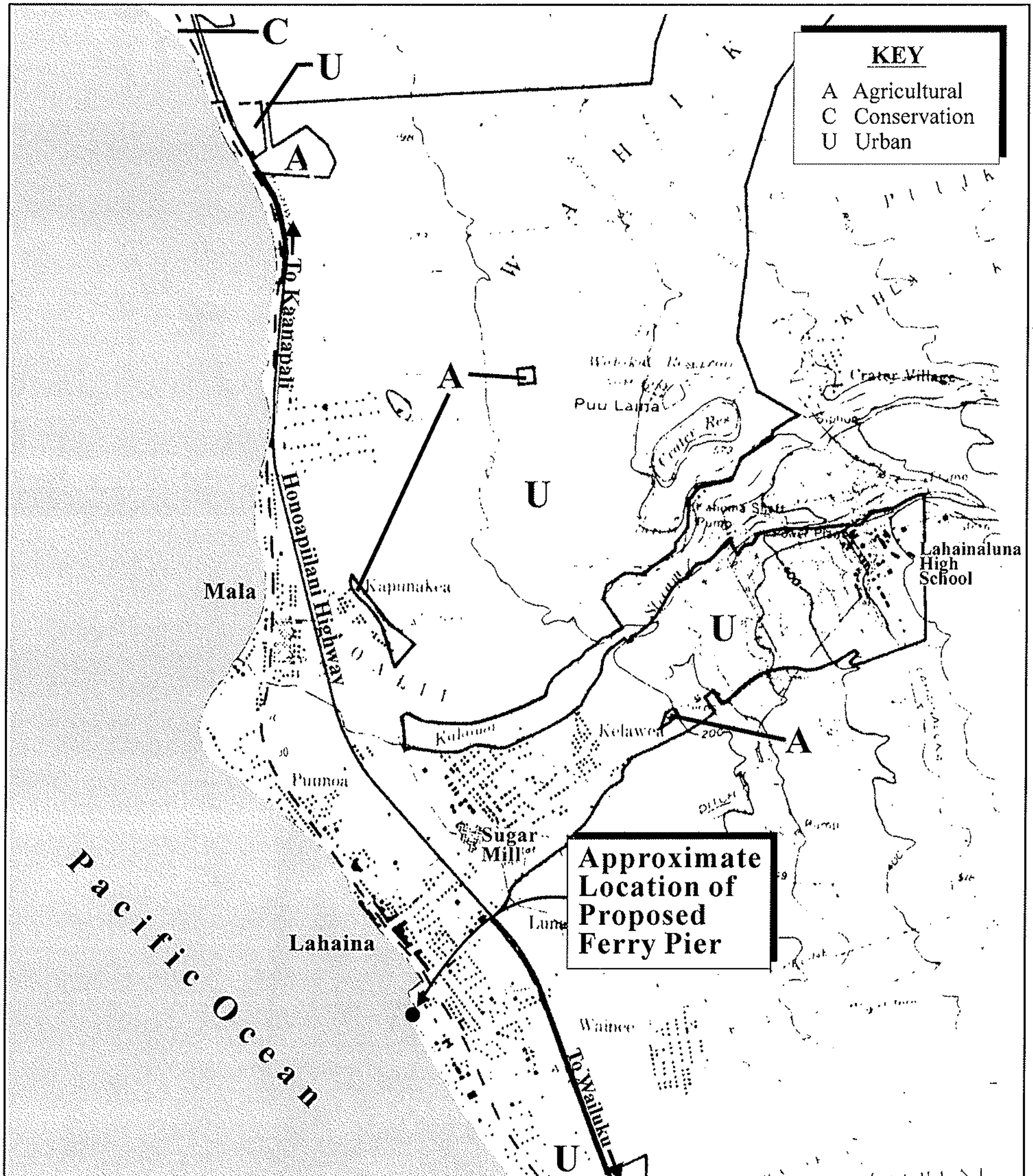
(i) **Alternative 1:** The upland improvements and proposed independent pier are permitted uses within the State Urban district and do not conflict with Chapter 205A, HRS.

(ii) **Alternative 2:** The upland improvements and proposed attached sheet pile pier are permitted uses within the State Urban district and do not conflict with Chapter 205A, HRS.

(iii) **Alternative 3:** The upland improvements and proposed attached pile supported pier are permitted uses within the State Urban district and do not conflict with Chapter 205A, HRS.

(iv) **Alternative 4:** The existing pier, Harbor Master building and parking stalls, which are located in the State Urban district, are permitted uses and do not conflict with Chapter 205A, HRS.

Conservation district use requirements are addressed below.



Source: State Land Use District Boundary Map, Lahaina Quad

Figure 9 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
State Land Use District Classifications

0 500 1000 2000 Feet

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhepier/deis/SLUD

3.2.2.2 State Conservation District

Pursuant to Hawai`i Administrative Rules (HAR) 15-15-20, lands within the State Conservation district are regulated by the State Department of Land and Natural Resources (DLNR) and are categorized into five (5) subzones: protective, limited, resource, general, and special. As indicated by the DLNR's Office of Conservation and Coastal Land, coastal waters makai of the certified shoreline fall within the Resource subzone. HAR 13-5-13 states that the objective of the resource subzone is, *"to develop, with proper management, areas to ensure sustained use of the natural resources of those areas"*. The Resource subzone encompasses lands and State marine waters seaward of the upper reaches of the wash of the waves to the extent of the State's jurisdiction (3 miles from shore), lands necessary for future parkland and lands presently used for park purposes, lands suitable for the growing and harvesting of commercial timber or other forestry products, lands suitable for outdoor recreational uses, and the offshore islands of the State of Hawai`i. As reflected by HAR 13-5-24, one of the identified land uses in the resource subzone is for marine construction. This use encompasses marine construction, dredging, filling, or any combination thereof involving submerged lands. As defined by HAR 13-5-2, submerged lands encompass lands that extend seaward from the upper reaches of the waves on shore to the limit of the State's jurisdiction.

3.2.2.3 State Conservation District Use Criteria

An application for a Conservation District Use Application (CDUA) Permit will be prepared and submitted to the Board of Land and Natural Resources for review and approval for project-related construction activities within the Conservation district resource subzone. The proposed pier improvement alternatives have been evaluated in this regard by the following criteria:

3.2.2.3.1 The proposed land use is consistent with the purpose of the conservation district.

Response: The purpose of the Conservation district is to regulate land use for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. The proposed improvements to the harbor facilities are deemed consistent with this purpose. Alternatives 1, 2, and 3 will alleviate safety concerns at the LSBH due to insufficient existing docking facilities. Alternative 4 does not promote long-term sustainability in the context of possible health, safety and welfare.

3.2.2.3.2 **The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur.**

Response: As noted above, Alternatives 1, 2, 3, and 4 are permitted within the Resource subzone.

3.2.2.3.3 **The proposed land use complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management", where applicable.**

Response: An assessment of the Coastal Zone Management objectives and policies has been completed and is included in Chapter 8.

3.2.2.3.4 **The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.**

Response: Identification and evaluation of alternatives, impacts, and mitigation measures are further discussed in this chapter. The project alternative selected would be the Least Environmentally Damaging Practicable Alternative (LEDPA). All impacts to the extent possible will be mitigated.

3.2.2.3.5 **The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.**

Response: Alternatives 2 and 3 are more compatible with local and surrounding areas. The new ferry pier and landside improvements, as proposed in Alternatives 2 and 3, will be visually integrated with the rest of the LSBH and adjacent buildings. The new buildings will be designed to unify architectural style and character, and will be consistent with Lahaina Historic District Guidelines. The scale and height of the ferry building proposed in Alternative 1 is not in character with the surrounding land uses. The West Maui Community Plan designates the landside areas of LSBH for Park (PK) uses. The project alternatives are analyzed for consistency with the objectives and policies of the Community Plan in Section 3.2.2.4. below. Alternative 4 existing building and structures on the pier do not conform to character of the Historic District and Lahaina Historic Guidelines.

3.2.2.3.6 The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.

Response: Alternative No. 1 would compromise the integrity and setting of the historic seawall with the placement of the access ramp over the seawall and attached to the harbor bulkhead. The two-story building on the Alternative No. 1 pier would also impact views and open space from adjacent land uses. Alternatives 2 and 3 will not adversely impact the historic seawall. The low rise, open shade structure will minimize adverse impacts to open space characteristics. Alternative 3 with the pile supported pier would also provide additional ocean views under the deck and between the piles. Alternative 4, no action alternative, would maintain existing views at the LSBH.

3.2.2.3.7 Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district.

Response: The development alternatives do not involve the subdivision of Conservation lands.

3.2.2.3.8 <u>The proposed land use will not be materially detrimental to the public health, safety and welfare.</u>

<u>Response</u>: Alternatives 1, 2, and 3 and landside improvement are designed to ease congestion within the LSBH and improve ferry service, which will improve public safety and welfare. In the context of public health and safety, only Alternative No. 4 would potentially impact public health and safety by maintaining current congestion and overcrowded conditions at the harbor.

3.2.2.4 <u>West Maui Community Plan: Affected Environment</u>

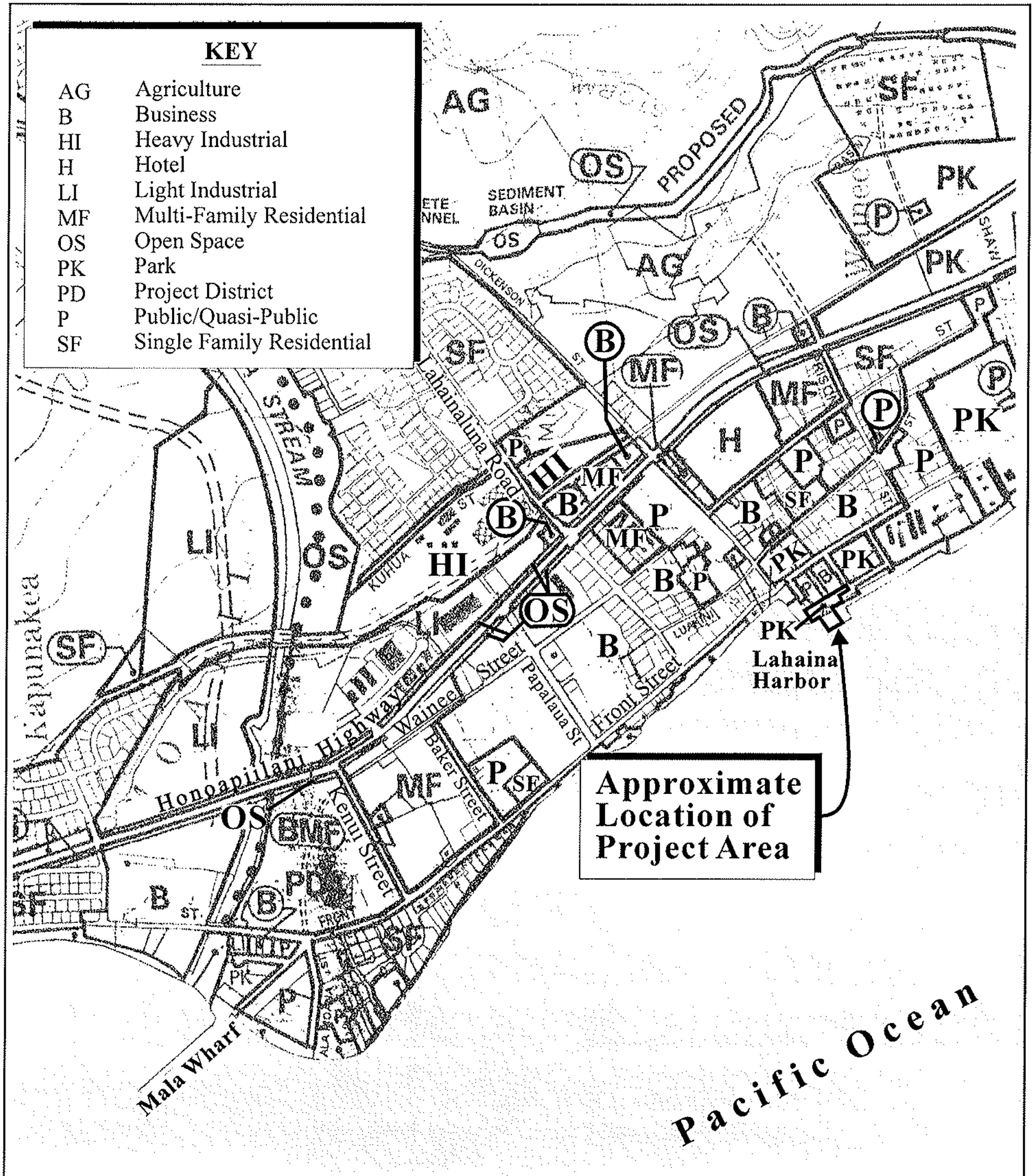
The LSBH is located in the West Maui Community Plan region, one (1) of the nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. The West Maui Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of development in the region.

Land use guidelines are established by the West Maui Community Plan land use map. The site of the existing ferry pier and administration office are designated for Park (PK) use in the community plan map. This designation applies to lands developed for recreational use. See **Figure 10**. The proposed project alternatives are a component of the LSBH land uses which includes both commercial and recreational uses and, therefore, are in compliance with the West Maui Community Plan land use designation.

The West Maui Community Plan sets forth goals which are statements identifying preferred conditions. Goals, objectives, and policies associated with the development of the proposed project include the following:

<u>Goals:</u>

- An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the needs of residents and visitors in a manner that provides for the stable social and economic well-being of residents and the preservation and



Source: West Maui Community Plan

Figure 10 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

West Maui Community Plan Land Use Designations

0 250 500 1000 Feet

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

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enhancement of the region's open space areas and natural environmental resources.

- An attractive and functionally integrated urban environment that enhances neighborhood character, promotes quality design at the resort destinations of Ka`anapali and Kapalua, defines a unified landscape planting and beautification theme along major public roads and highways, watercourses, and at major public facilities, and recognizes the historic importance and traditions of the region.

- Timely and environmentally sound planning, development, and maintenance of infrastructure systems which serve to protect and preserve the safety and health of the region's residents, commuters, and visitors through the provision of clean water, effective waste disposal, and efficient transportation systems which meet the needs of the community.

Objectives and Policies:

- Ensure that new projects or developments address potential impacts on archaeological, historical, and cultural resources and identify all cultural resources within the project area as part of initial project studies. Further require that all proposed activity adequately mitigate potential adverse impacts on cultural resources.

- Maintain the scale, building massing, and architectural character of historic Lahaina Town.

- Establish, expand and maintain parks, public and private open spaces, public facilities, cemeteries, and public shoreline areas within Lahaina Town.

- Building Character:

    a. New building and renovation of existing buildings in Lahaina Town should respect the scale, texture, materials, and facades of existing structures in the Lahaina Historic District.

    b. Building heights should reflect the context of existing building heights and massing in the Lahaina Historic District. The maximum building heights shall be two stories or 35 feet with a mixture of one- to two-story building heights encouraged.

c. Building design should complement the pedestrian character of Lahaina Town. Restraint and harmonious relationships with natural and man-made surroundings should characterize building form; harsh forms or shapes should be avoided; sloped roofs should be encouraged. Design elements which relate to human scale should be emphasized. Design features should reflect prevalent town themes through traditional or contemporary means.

3.2.2.4.1 West Maui Community Plan: Environmental Consequences

The proposed project alternatives are intended to improve operating conditions at the LSBH by improving the administration office, alleviating vessel traffic and congestion, and improving vehicle and pedestrian traffic flow. The proposed ferry pier alternatives will be able to accommodate the interisland ferry, as well as recreational and commercial vessels and cruise ship tenders. In addition, the proposed project alternatives will facilitate surfer access to nearby surf spots.

The proposed improvements to the administration office and replacing the ferry ticketing booth will complement the architectural character of the Historic District. These landside improvements are common elements of Alternatives 2 and 3. The larger two-story structure on the pier as proposed in Alternative would not be as compatible with the architectural character of the Historic District.

3.2.2.5 County Zoning: Affected Environment

There are three (3) historic districts on the island of Maui - two (2) in Lahaina (Historic District Nos. 1 and 2) and one (1) in Wailuku (Historic District No. 3). Regulations on building and uses within these districts are governed by the provisions of Chapter 19.52 of the Maui County Code. The project area is located within the limits of Historic District No. 1. The regulations for Historic District Nos. 1 and 2, which are both located in Lahaina Town, covers a multitude of uses ranging from single-family to public/quasi-public to business/commercial uses.

3.2.2.5.1 County Zoning: Environmental Consequences

The historic district review and approval process provides a means of ensuring orderly, efficient growth and development within the County's historic districts. Toward this end, an application for Historic District Approval will be prepared and submitted to the Maui County Cultural Resources Commission for review and approval. All plan alternatives have incorporated design features which are in compliance with the Architectural Style Book for Lahaina (1969). Alternative 1 will have greater impact on the historic character due to the size of the building, impact on historic seawall and its impact on the visual character of the area. The open shade structure proposed in Alternatives 2 and 3 will have a lower profile than Alternative 1. Collectively, the new Administrative office, ferry ticket booths, and open shade structure will help consolidate a historic architectural style in character with the Lahaina Historic District at the LSBH. Alternative 4 will maintain the existing Harbor Master's office, utility buildings and ferry ticket booth which are not in compliance with the architectural style of the Historic District.

3.2.2.6 Economic Development: Affected Environment

3.2.2.6.1 Economy

The economy of Maui is heavily dependent upon the visitor industry. The dependency on the visitor industry is especially evident in West Maui, which is one of the State's major resort destination areas. Major hotels in this region include the Hyatt Regency Maui (806 rooms), the Westin Maui (759 rooms), the Royal Lahaina Resort (592 rooms), the Ritz-Carlton Kapalua (548 rooms), the Sheraton Maui Resort (510 rooms), and the Ka`anapali Beach Hotel (430 rooms). The historic Pioneer Inn is located adjacent to the LSBH.

West Maui's visitor orientation is reflected in the character of Lahaina Town, which serves as a center for visitor-related retail outlets and activities.

Pineapple cultivation, another vital component of the West Maui economy, is handled by Maui Land & Pineapple Company, Inc. Since the termination of sugar cane cultivation in 1999, small-scale coffee and seed corn operations have supplanted sugar cane on a portion of the lands formerly cultivated by Pioneer Mill Company, Ltd.

3.2.2.6.2 Labor Force

As of February 2007, the seasonally adjusted unemployment rate for the State of Hawai`i and Maui County stood at 2.3 percent and 2.0 percent, respectively (State Department of Labor and Industrial Relations, April 2007). For the same period, the unemployment rate for the island of Lana`i was 1.7 percent and the island of Moloka`i was 5.2 percent.

In terms of the profile of employed persons, West Maui generally follows the County-wide trends for the labor force characteristics shown in **Table 2**.

Table 2. Labor Force Characteristics 2005

LABOR FORCE CHARACTERISTICS		
Occupational Category	**Maui County**	**West Maui**
Agriculture	2.8 percent	1.6 percent
Manufacturing	1.9 percent	0.4 percent
Construction	3.9 percent	2.5 percent
Transportation, Communication and Utilities	3.6 percent	1.8 percent
Trade	11.7 percent	22.4 percent
Banking, Finance	3.6 percent	4.3 percent
Hotel	13.2 percent	26.5 percent
Other Services	26.3 percent	13.7 percent
Government	10.2 percent	4.1 percent
Self-Employed	22.8 percent	22.7 percent
Source: Maui County Planning Department 2006		

In terms of the profile of employed persons, more West Maui workers were employed in the hotel service industry (26.5 percent) when compared to the County-wide profile (13.2 percent) and trade industry (22.4 percent and 11.7 percent, respectively). Because of West Maui's emphasis on hotel service jobs, all other job sectors exhibited slightly lower participation rates.

3.2.2.6.3 Economic Development: Environmental Consequences

The proposed alternative plans will have beneficial economic impacts to the West Maui region through construction employment. Alternative 1 will have the greatest positive impact during construction due to its greater capital cost relative to Alternatives 2 and 3.

The interisland ferry provides greater economic opportunity to the residents of the islands of Lana`i and Moloka`i, whom rely on the ferry to commute to jobs in West Maui. Moloka`i has one of the highest unemployment rates in Hawai`i and access to jobs in West Maui will have beneficial economic consequences. The seasonally adjusted unemployment rate in February 2007 was 5.2 percent in Moloka`i compared to 2.3 percent in the State of Hawai`i. The interisland ferry also provides an economical means of transportation for skilled construction workers, health care providers, professionals and others, who routinely travel to Lana`i and Moloka`i to work and/or provide services that would otherwise not be available.

3.3 LAND ACQUISITION, DISPLACEMENTS, AND RELOCATION OF EXISTING USERS

3.3.1 Affected Environment

The proposed ferry pier alternatives are located at the LSBH. The proposed expansion area for all development alternatives are sited in an area to the north of the existing pier that is not occupied by other uses. The landside improvements on Wharf Street, Hotel Street and Papalekane Street common to Alternatives 1, 2 and 3 will be carried out within existing public rights-of-way.

3.3.2 Environmental Consequences

Land acquisition will not be required for any of the plan alternatives. Proposed improvements of the alternative plans will occur on land owned the State of Hawai`i or within the County road right of way. No displacement or relocation of the existing users will be required with the proposed plan alternatives under consideration.

3.4 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

3.4.1 Affected Environment

The ancient Hawaiian name for Lahaina was *Lele*, which means "to leap" or "to disembark" as from a canoe. In pre-contact times, Lahaina's harbor was referred to as *Keawa`iki* (the small harbor). Along with Maui, the islands of Lana`i and Moloka`i encircle the `Au`au Channel providing relatively calm and safe waters for anchorage. The Lahaina District was considered to be a favorable place by high chiefs because of its natural resources and its proximity to Lana`i and Moloka`i (Rosendahl, 1994). The majority of lands from sea-level to approximately the 700-foot elevation comprised a nearly-continuous band of agricultural and related habitation features. Initial development of the field systems likely occurred between 1200 AD to 1400 AD. Seasonal dryland agricultural practices eventually evolved to year-round cultivation as water diversion and distribution improvements were implemented.

Historical accounts document Lahaina as an important population center. Such accounts note the continued presence of agriculture through the early nineteenth century. Crops included *kalo* (taro), potatoes, yams, and sugarcane.

Lahaina was the home of Kamehameha I, who united the islands, for some time. After his death in 1819, Lahaina began to receive frequent visits from explorer ships and soon saw the arrival of the first Christian missionaries. From the 1820s to about 1860, Lahaina accommodated whaling ships and served as a focal point for trading. The smooth waters of the Lahaina roadstead allowed vessels to arrive and depart with the prevailing winds. While in port, visiting ships would stock up on fresh water and food supplies, while their crews would go ashore for rest and relaxation. The 1890s saw the advent of commercial shipping in Lahaina as West Maui was a good source of sandalwood. The sandalwood trade established ties with nations such as Russia and China. The port town also served as a recruiting ground for Hawaiian seamen, many of whom signed on as whalers.

With the decline in the whaling industry, the sugar industry began to evolve. Beginning in mid-century, sugar production developed rapidly and further developed with the consolidation of the smaller mills into what became known as Pioneer Mill Company, Ltd. As with sugar plantations, the late 1800's and early part of the next century saw the rapid expansion of the Pioneer Mill Company. By the early part of the twentieth century, Pioneer Mill controlled approximately 12,500 acres of land (Xamanek Researches, 2000). Sugar cultivation areas extended from Ukumehame in the south to Honokowai in the north.

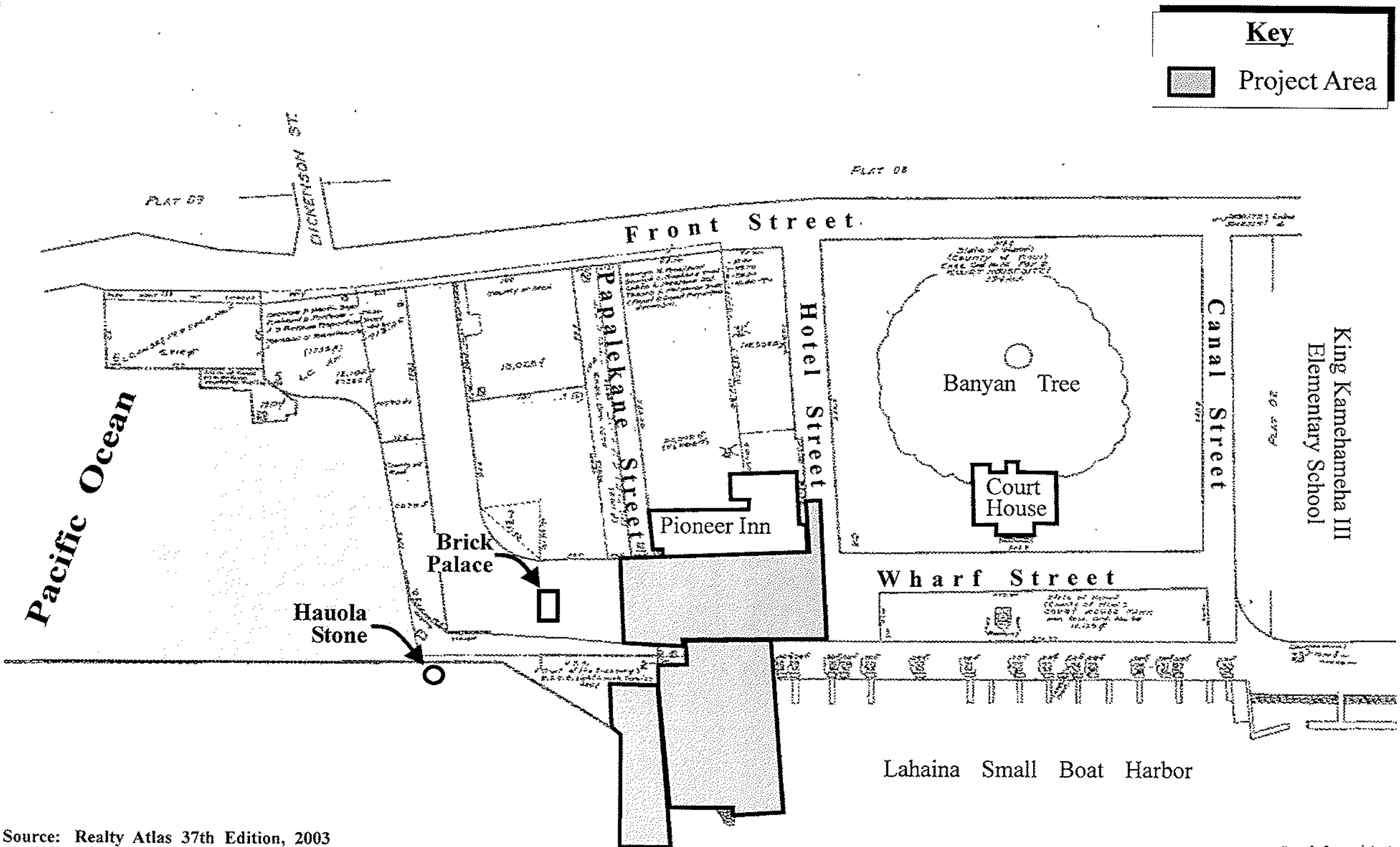
In addition to sugar, pineapple became a viable commercial crop in West Maui. Baldwin Packers opened a cannery in Lahaina in 1919 to provide the produce processing component of the pineapple industry. Lands of pineapple cultivation generally started from Honokowai and continued north to Honokohau.

The historic significance of Lahaina Town itself is well documented. Lahaina was the home of Kahekili until his death in 1794. It became the home of Kamehameha the Great after his conquest of the island and was designated as the capital of the Hawaiian Kingdom in 1843. Evidence of Lahaina's historic qualities is apparent today.

In 1962, Lahaina was designated a registered National Historic Landmark under the provisions of the Historic Sites Act of August 21, 1935. In 1966, Lahaina was listed in the National Register of Historic Places. The project area is located within the limits of the Lahaina National Historic Landmark District.

An archaeological inventory survey and a cultural assessment were carried out at the LSBH site to identify historic, archaeological, and cultural resources. See **Appendix "B"**. Historic and cultural sites within proximity of the project area include the following. See **Figure 11**.

Hauola Stone (Pohaku O Hauola): As far back as the 14^{th} and 15^{th} centuries, the ancient Hawaiians made use of this special stone, which loosely translated means "extending life and health". In those times, it was used as a birthing stone for royalty. When a chiefess was ready to give birth, attendants would help her into the stone chair, assist in delivering the child, and witness the birth. In more recent times, it was believed that this stone was useful for healing purposes since it is located in an area where both fresh and salt water mix, such waters being known for healing powers. Ailing persons would sit in the seat, with the waves washing over them, while offering ceremonial prayers to regain health.



Source: Realty Atlas 37th Edition, 2003

Figure 11

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Historic and Cultural Sites Map

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/historicsite

The Brick Palace: This building, which was the first western style structure in the islands, was built in 1798 by ex-convicts from the British penal colony at Botany Bay, Australia. Constructed of locally manufactured brick, the two-story building (20 ft. x 40 ft.) contained four (4) rooms with wooden walls and glazed windows. The building was constructed at the command of Kamehameha I for his favorite wife, Queen Ka`ahumanu, who ironically preferred to live in a more airy grass house built nearby. The building was used intermittently as a storehouse and residence until the 1850s. Today, only the foundation of the building remains.

Pioneer Inn: This building dates back to 1901. Extensions and renovations have retained the style of the original hotel. As a point of interest, the old turn-of-the century rules for guests are still posted in each room.

Banyan Tree: This tree was planted in April 1873 to mark the 50th anniversary of the beginning of Protestant missionary work in Lahaina. The tree is more than 60 feet in height and casts a shade which covers two-thirds of an acre.

Lahaina Courthouse: Stones from the demolished Hale Piula (iron-roof house), a palace which was built for Kamehameha III but never completed, were used to construct this building. The courthouse also served as a customs house and the center for anti-smuggling activity during the whaling era. It was at the courthouse where the formal annexation of the islands by the United States was marked in August 1898 by the lowering of the Hawaiian flag and the raising of the American flag.

Cultural assessment interviews were conducted to obtain a broader range of cultural resource perspectives in the proposed project area. The people interviewed ranged from cultural practitioners to those born and raised in Lahaina and recognized in the community for their knowledge of Hawaiian culture and history. Refer to **Appendix "B"**.

Cultural interviewees emphasized the concept of the ahupua'a of Waine'e, when discussing the potential cultural impacts, rather than just looking at the project area and immediate surrounding properties. Interviewees indicated that everything in the Waine'e ahupua'a, extending from the mountain to the sea, is connected. Important features identified in this context in the vicinity of the LSBH were:

a. Moku'ula, the summer residence of King Kamehameha III and Lokoomokuhinia, the royal fish pond surrounding Moku'ula;

b. Hauola Stone (Site 50-50-03-1202) still used by native Hawaiians in cultural practices for its healing properties;

c. King Kamehameha III's red brick house located close to the stone;

d. The reef named Kapapalimuapi'ilani, fronting Lahaina Town from Puumana in the south to Puunoa in the north, which was favored by the noted Maui chief Pi'ilani as a place for gathering limu; and

e. The famous Keawa`iki surf and 'Uno surf sites, outside the harbor entrance to the north and south, respectively where the royalty used to surf and which still are very popular surfing spots.

3.4.2 <u>Environmental Consequences</u>

As the proposed project will involve the use of Federal Transit Administration funds, the assessments were conducted as an "undertaking" in compliance with Section 106 of the National Historic Preservation Act [16 U.S.C. 470f] which requires Federal agencies to take into account the effect of their undertakings on historic properties.

The Lahaina Historic District is listed as a National Historic Landmark and on the National and State Register of Historic Places because it maintains the atmosphere of a mid-19th century Hawaiian seaport and port of call for American whalers. The eight (8) principal historic sites and structures listed on the register include, The Baldwin House (located on Front Street and Dickenson Street), Old Spring House, Court House, Old Prison (located on Prison Road and Wainee Street), Wainee Church and Cemetery (located on Wainee Street between Chapel and Shaw Streets), Hale Aloha (located on Wainee Street between Chapel Street and Prison Road), United States Marine Hospital (located on Front Street between Kenui and Baker Streets), and Roman Catholic Church (located on Wainee Street and Dickenson Street). Of the eight (8) sites, only the Court House is in close proximity to the proposed improvements. The contributing sites listed on the register listed approximately 60 sites. However, there are only a few individual records and descriptions for the sites. Of the contributing sites listed in the archaeological assessment, only Kamehameha I's Brick Palace (Site 2951) and Heiau that existed on the Lahaina Wharf are located in the vicinity of the proposed ferry pier improvement alternatives. The stones of the Heiau, however, were removed after 1832 and used to surround the tomb of Keipuolani, a wife of Kamehameha I.

Alternative 1 may potentially impact Site 2951 more than Alternatives 2 and 3 since the main access to the pier would be closer to the site and generate more pedestrian activity.

The Alternative 1 access ramp from the harbor to the pier could also potentially impact the historic seawall along the harbor bulkhead. Access to the new pier provided by Alternatives 2 and 3 would be provided by the existing pier and, therefore, pedestrian activity would be similar to existing conditions. Alternatives 2 and 3 would also not adversely impact the historic seawall.

Cultural interviewees placed extreme importance on the Hauola Stone, King Kamehameha I's Palace Site, the Keawa`iki surf and 'Uno surf sites, and the Kapapalimuapi'ilani reef due to their historical and cultural significance and proximity to the proposed improvements. In developing the overall design of the project alternatives, the siting of the new pier in relation to these cultural sites was given careful consideration. In Alternatives 1, 2, and 3, the new pier will be located approximately 120 feet to the south of the Hauola Stone and adverse impacts to the Hauola Stone are not anticipated from the proposed alternatives. The new pier in Alternatives 2 and 3 is designed to connect to the existing pier rather than be independently accessed from the historic seawall as in Alternative 1 in order to avoid potential impacts to the seawall and to the King Kamehameha I's Palace Site. Oceanographic design criteria and coastal engineering assessment provided by EKNA Services, Inc., indicate the project related construction and dredging will not adversely impact the Keawa`iki surf and 'Uno surf sites. See **Appendix "C"**.

3.5 VISUAL AND AESTHETIC QUALITIES

3.5.1 Affected Environment

The LSBH is located along the shoreline and is situated in an area which provides scenic views. Scenic resources in the vicinity include Lahaina Town itself, and the West Maui Mountains, which are to the east of the LSBH, as well as the Pacific Ocean and the offshore island of Lana`i, which are to the west. Open space resources in the region are characterized by the West Maui Mountains, as well as the vast expanse of present and former agricultural lands that lie between the mountains and existing urbanized areas near the coastline.

Aesthetic qualities in the affected environment include the historic character of Lahaina Town. The architectural styles of Lahaina fall into three (3) overlapping periods which are generally characterized by the building materials available at the time. The architectural styles are grouped as follows:

- Native Hawaiian - before 1820, with pole logs and thatched material for walls and roofs;
- 19th century missionary, with materials of stone, coral, and clay for walls and thatched and single roofs; and
- Victorian - 1850 through 1900, with materials of west coast sewn lumber, shingles, millwork, and hardware in a style of post, beam, studs, joists, and wood finishes.

3.5.2 Environmental Consequences

The two-story building in Alternative 1 will have greater potential impact on scenic views due to its height. The low-rise, open-sided structure in Alternatives 2 and 3 have been designed to have minimal visual impact on views to and from the harbor. This structure will be consonant with the standards of the Lahaina Historic District, and in accordance with the Architectural Style Book for Lahaina. The design of the shade structure has been modified by a design which incorporates pitched roofs and trellises to provide view corridors and to reduce the mass of the structure. Alternative 3 will provide more ocean views underneath the pile supported pier than Alternative 2, which has sheet pile and fill under the pier. Similarly, the new administration building and ticket booths will be designed to unify architectural character of the Historic District and comply with the style book.

3.6 PARK LANDS AND RECREATION AREAS

3.6.1 Affected Environment

West Maui is served by numerous recreational facilities offering diverse opportunities for the region's residents. There are nearly 20 County parks in West

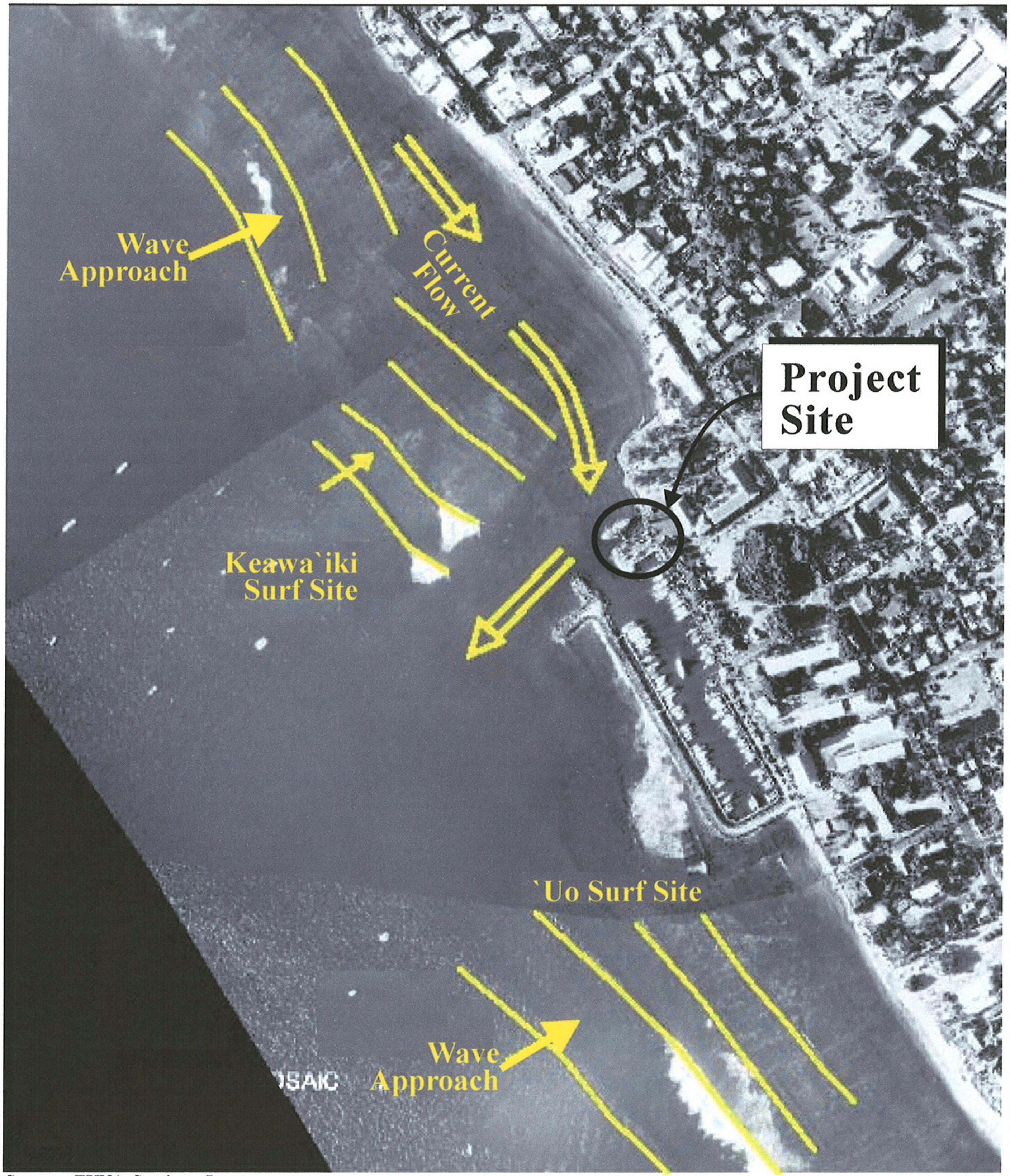
Maui. Approximately one-third of the County parks are situated along the shoreline and provide for excellent swimming, diving, and snorkeling, as well as fishing, surfing, picnicking, sun bathing, and other shoreline-related activities.

In addition, the Ka`anapali and Kapalua Resorts operate world-class golf courses which are available for public use.

In addition to recreational boating facilities at the LSBH, popular surf spots include the Keawa'iki and 'Uo. Waves breaking over the shallow reef to the north and south of the LSBH causes a rise in water level known as setup. This wave set up causes the two (2) popular surfing sites near the LSBH. The Keawa`iki surf site is located just outside the harbor entrance on the north side and `Uo surf site is located on the south side of the harbor. See **Figure 12**. The circulation of water in the vicinity of the LSBH is characterized by the movement of water following the wave energy across the reef towards the shoreline then flowing into the channel and out to sea through the deeper channel waters. Passive recreational areas in the vicinity of the project include the grassed, open space area around the Brick Palace and the grassed, courtyard area surrounding the Banyan Tree. Recreational facilities in outlying areas include Puamana Park, the Lahaina Aquatic Center, the Lahaina Recreation Center, Malu`uluolele Park, and Kamehameha Iki (Armory) Park.

3.6.2 <u>Environmental Consequences</u>

The proposed project alternatives will benefit recreational boaters and use of the harbor by helping to alleviate congestion in the harbor. Alternative 1 will have a greater beneficial impact in relieving pedestrian congestion at the LSBH due to the relocation of the Harbor Master's office and ferry ticket booth on the second story of the pier building than Alternatives 2 and 3. Alternative 1 will redirect more pedestrian traffic away from the existing facilities than Alternatives 2 and 3. Alternative 1 may impact the open space around the Brick Palace.



Source: EKNA Services, Inc.

Figure 12 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Wave and Current Patterns at Lahaina Boat Harbor

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnnier/deis/wavepattern

The new pier Alternatives 1, 2 and 3 are inshore of the entrance to the boat basin and therefore, they will not alter the current flow and existing circulation patterns on the reef. The dredging required to widen the entrance channel and berthing area to the north of the pier, which are common to Alternatives 1, 2 and 3 will be confined primarily to the inshore terminus of the entrance channel. As such, existing surf sites located at the reef margins should not be adversely impacted by development of either alternatives.

3.7 AIR QUALITY AND ENERGY

3.7.1 Affected Environment

The State of Hawai`i ambient air monitoring network meets the minimum monitoring requirements for all criteria pollutants pursuant to the National Environmental Protection Act of 1966 [40 CFR Part 38, Subpart B]. The Lahaina region in general does not experience adverse air quality conditions. There are no point sources of airborne emissions in the immediate vicinity and the air quality at the LSBH is considered good. Airborne pollutants that do exist can largely be attributed to ship exhaust from harbor traffic and to vehicle exhaust from surrounding roadways. These sources are intermittent, however, and the prevailing tradewinds soon disperse particulates generated by these temporary sources.

3.7.2 Environmental Consequences

Air quality impacts attributable to construction activities include dust generated by short-term, construction-related activities. Site work involving pile placement and fill activities and grading of parking expansion area will generate airborne particulates. Dust control measures, such as dust screen fencing and regular watering and sprinkling for the landside improvements, will be implemented to minimize nuisance impacts to adjacent areas.

Alternatives 1 and 2 will have more construction-related air quality impacts than Alternative 3 due to the fill placement under the new pier. In the long term, project-related vessel and vehicle traffic will generate exhaust emissions. However, these emissions are not expected to adversely impact local and regional ambient air quality conditions.

Alternative 1 will use more electrical energy due to the size of the Administration office and facilities proposed for the two-story building. Alternatives 2 and 3 will have minimal energy use since the shade structure on the pier will be open sided and naturally vented and illuminated.

3.8 NOISE AND VIBRATION

3.8.1 Affected Environment

Existing background noise in the project area is principally attributed to ship traffic in the LSBH and vehicle traffic on surrounding roadways. In addition, the flight paths of arriving and departing aircraft at the Kapalua West Maui Airport, located about 6.0 miles to the north of the project area, place the site beyond the limits of aircraft noise exposure. Vibration at the LSBH is primarily attributed to the ocean surf and wakes from marine vessels as they maneuver to dock at the pier.

3.8.2 Environmental Consequences

Long-term energy use related to the interisland ferry terminal operations includes diesel fuel consumed by the two (2) ferry operators and electrical power used at the Harbor Master's office and ferry kiosk.

As with air quality, ambient noise conditions will be temporarily impacted by construction activities. Construction tools, equipment, machinery, and pile placement activity would be the dominant source of noise during the construction period. Proper equipment and maintenance are anticipated to minimize noise levels. In addition, equipment mufflers or other sound attenuating devices may be utilized as required. All construction activities will be in compliance with State Department of Health Community Noise Standards.

Noise and vibration impacts during construction will be greater with Alternatives 1 and 2 due to placement of sheet pile and fill to support the new pier. In Alternative 3, it is anticipated the piles will be drilled and set in place, thereby, avoiding the noise and vibration caused by pile driving activities. In the long term, vibration impacts caused by vessel operations would be less in Alternatives 1 and 2 due to the solid nature of the sheet pile and fill structure.

From a long-term perspective, implementation of the project alternatives are not anticipated to generate adverse noise impacts.

3.9 BIOLOGICAL RESOURCES

3.9.1 Affected Environment

Assessment of the biological resources was carried out by AECOS, Inc. See **Appendix "D"**. There are no rare, threatened, or endangered species of land based plant life within the LSBH.

Land based animal life which may be found in this area is typical of the urbanized regions of West Maui and include rats and mice. Domestic mammals found in the area include dogs and cats. Avifauna commonly found in this area include the common mynah, Japanese white-eye, spotted dove, barred dove, and house finch. There are no known rare, threatened, or endangered species found in the vicinity of the project area. In addition, there are no streams or wetlands located within or in close proximity to the project area.

The harbor area was surveyed for marine biota by AECOS, Inc. in 2004 and 2005. Refer to **Appendix "D "**. The reef flat to the south of the entrance channel was noted as being more productive and diverse than the reef flat to the north, which is the site of the proposed pier. Species commonly encountered in the LSBH area include red algae (*Acanthophora spicifera*), doted periwinkle (*Littoraria pintado*), the thin-shelled rock crab (*Grapsus tenuicrustatus*), and the yellow-striped goatfish (*Mulloidichthys flavolineatus*). Prominent coral species include rice coral (*Montipora capitata*) and spreading coral (*Montipora patula*). Coral growths are more prominent on the sides of the entrance channel than on the reef flats.

In December 2005, the U.S. Fish and Wildlife Service (USFWS) conducted a marine biological survey of the LSBH area at the request of the FTA and in accordance with the U.S. Fish and Wildlife Coordination Act (USFWCA) of 1934 [16 U.S.C. 661 et seq: 48 stat. 401]. See **Appendix "E"**. The findings of the marine survey is summarized as follows. A total of 38 species of marine plants, 50 species of benthic macro-invertebrates, 11 species of corals of which *Montipora* was the most common, and 52 species of reef fishes were observed and recorded. The federally threatened green sea turtle and endangered hawksbill sea turtles, Hawaiian Monk Seal, and

Humpback Whales are known to exist in Hawaiian waters. These marine species are protected under the Endangered Species Act of 1973 (ESA) [50 CFR Part 18] and the Humpback Whale and Hawaiian Monk Seal are also protected under the Marine Mammal Protections Act [50 CFR 216].

3.9.2 Environmental Consequences

As the proposed project will involve the use of FTA funds, the assessments were conducted in accordance with the USFWCA of 1934 and Section 7(a)(2) of the ESA.

There were three (3) green sea turtles observed during the marine biology field survey carried out by USFWS. The green sea turtles are known to forage on the reef flats surrounding the LSBH. The hawksbill turtles, Hawaiian Monk Seals and Humpback Whales are also known to inhabit the waters off Lahaina and LSBH. Noise and vibration during construction could potentially impact nesting of green sea turtles. Alternative 3 will have less noise and vibration during construction activities than Alternatives 1 and 2. Due to the larger building on top of the pier, Alternative 1 would have more noise impacts during construction than Alternatives 2 and 3.

Potential adverse impacts to the protected marine species may be mitigated by following Best Management Practices (BMPs) during construction.

A. Turbidity and siltation from project-related work will be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

B. Any construction-related debris that may pose an entanglement hazard to marine protected species will be removed from the project site if not actively being used and/or at the conclusion of the construction work.

C. All project-related materials and equipment placed in the water will be free of pollutants.

D. No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water.

E. No contamination (trash or debris disposal, alien species introductions, etc.) of marine (reef flats and open ocean) environments adjacent to the project site will result from project-related activities.

F. Fueling of project-related vehicles and equipment will take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site will be developed. Absorbent pads, containment booms, and skimmers will be stored on-site to facilitate the cleanup of petroleum spills.

G. Underlayer fills will be protected from erosion with core-loc units (or stones) as soon after placement as practicable.

H. Attempts will be made to prevent discharge of dredged material into the marine environment during the transporting and off-loading of dredged material.

I. Return flow of or run-off from dredged material stored at inland dewatering or storage sites will be prevented.

J. Drift to waterways and non-target sites will be avoided.

K. Desirable non-target vegetation will be protected from overspray. Tarps may be needed in some situations.

A detailed analysis of the alternatives was independently carried out by the USFWS pursuant to the following Federal regulations:

i. Endangered Species Act, [50 CFR Section 7(a)(2)], requiring Federal agencies to insure that any action by a Federal agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitats; and

ii. Clean Water Act, [40 CFR Part 230 Section 404(2)(b)], to ensure, whenever avoidance of waters of the U.S. is not practicable, minimization of impacts will be achieved, and unavoidable impacts will be mitigated to the extent reasonable and practicable.

Refer to **Appendix "E"**. A summary of the marine environmental impacts on the alternatives is provided as follows.

3.9.3 Evaluation Methodology

3.9.3.1 Marine Biological Assessment: Affected Environment

USFWS led a site reconnaissance team to conduct a marine biological assessment of the shallow reef environment at LSBH to evaluate potential impacts to fish and wildlife resources based on the proposed project design criteria. Observations of the distribution and relative abundance of reef fishes, corals, other macro-invertebrates, and algae were compiled.

3.9.3.2 Quantitative Determination of Compensatory Mitigation

HEA (Habitat Equivalency Analysis), a mathematical model which scales compensatory mitigation to offset project-related impacts, was used to evaluate the design alternatives. Input to the HEA model included biological data from the survey. The output of the model is provided in time and spatial dimensions, measured in square-foot years. A square-foot year refers to all the resource services provided by one (1) square foot of habitat for one (1) year.

3.9.4 Environmental Consequences: Alternatives 1 and 2

3.9.4.1 Impacts to Reef Flat

For Alternatives 1 and 2, 2,720 s.f. (square feet) of reef flat is anticipated to be permanently removed and changed to sand. Secondary impacts caused by sedimentation from dredging are estimated to impact 950 s.f. of reef flat. The coral reef resources in this area are expected to be reduced to 80 percent of the baseline services. The recovery within the band to 100 percent is anticipated to take 15 years. Net Loss of Reef Flat is estimated to be 89,281 s.f. years.

3.9.4.2 Impacts to Sand

The sheet pile and fill will cover and cause permanent loss of 5,020 s.f. of sand habitat. The dredging will remove sand covering 17,040 s.f. every 10 years. The dredged reef flat will change to sand, therefore adding 2,720 s.f. of new sand habitat. The sand community is expected to return to 100 percent of lost resources within 6 months after dredging. Net loss to sand is estimated to be 166,155 s.f. years.

3.9.4.3 Impacts to Cement Piling Community

Fourteen (14) pilings and their associated reef communities will be removed and replaced by sheet pile. It is not expected that organisms will grow on the metal sheet pile. Net loss to Cement Piling Community is estimated to be 17,080 s.f. years.

3.9.5 Environmental Consequences: Alternative 3

3.9.5.1 Impacts to Reef Flat

Under Alternative 3, the amount of dredging required for the pile supported design alternative is the same as the sheet pile and fill alternative. Therefore, Net Loss to Reef Flat is estimated to be 89,281 s.f. years.

3.9.5.2 Impacts to Sand

Dredging will remove 21,100 s.f. of sand covering. Sand habitat lost due to a net placement of 84 new piles is estimated to be 270 s.f. The total affected sand habitat will be 20,830 s.f. Dredging is anticipated to occur every 10 years. The dredged reef flat will change to sand, therefore adding 2,720 s.f. of new sand habitat. The sand community is expected to return to 100 percent of lost resource within 6 months after dredging. Net Loss to Sand is estimated to be 116,155 s.f. years.

3.9.5.3 Impacts to Concrete Piling Community

A biological community was found growing within a six-foot vertical section of the pilings. It is estimated that 528 s.f. of piling community will be removed. For Alternative 3, 100 new concrete pilings will create 3,770 s.f. of new habitat. This habitat is anticipated to achieve 100 percent of lost services in 30 years. Net Gain to Cement Piling Community is estimated to be 60,309 s.f. years.

3.9.6 Compensatory Mitigation

Three (3) HEA models (sand, piling, and reef flat) were run for the three (3) alternatives.

3.9.6.1 Sand

In Alternatives 1, 2, and 3, 2,720 s.f. of reef flat will be dredged and replaced by sand habitat. The net loss of Alternatives 1 and 2 was estimated to be 166,155 s.f. years and Alternative 3 was estimated to be 116,845 s.f. years. Alternative 3 reduces the impacts to the sand resource by 49,310 s.f. years. It is anticipated that the newly created sand habitat will be repopulated within 6 months to a year. Due to the apparent quick recovery time for sand habitats, no additional compensatory mitigation will be required for either design alternative.

3.9.6.2 Pilings

In Alternatives 1, 2, and 3, 14 existing cement pilings and associated community will be removed, affecting 528 s.f. of this habitat type. This habitat will be lost in Alternatives 1 and 2. The net loss is estimated at 17,080 s.f. years. Alternative 3 will provide 100 new piles, creating 3,770 s.f. of new habitat. Alternative 3 results in a net gain of 60,309 s.f. for the cement piling community.

3.9.6.3 Reef Flat

In Alternatives 1, 2, and 3, 2,720 s.f. of reef flat community will be permanently removed. No proposed project designs will produce in-kind habitat, therefore, compensatory mitigation is recommended. One mitigation scenario identified by USFWS and assessed in the HEA model involved the removal of a vessel that ran aground approximately 200 yards north of the LSBH and restoration of the approximately 4,100 s.f. nearshore marine habitat that was damaged. The HEA model estimated this mitigation would provide a net gain of 15,742 s.f. years of reef flat habitat.

3.9.7 Summary of Development Alternatives Assessment, Impacts, and Mitigation

A summary of the marine environmental parameters assessed by the HEA models on the proposed alternatives is presented in **Table 3**, below.

Table 3. Comparison of Development Alternatives Impact on the Marine Environment

	Alternatives 1 and 2	Alternative 3	Alternative 4
Sand	Loss of 166,155 s.f. years	Loss of 116,845 s.f. years	No net loss
Piling	Loss of 17,080 s.f. years	Gain of 60,309 s.f. years	No net loss
Reef Flat	Gain of 15,742 s.f. years	Gain of 15,742 s.f. years	No net loss/gain
Source: USFWS 2006			

Based on the HEA models, Alternative 3 minimizes the impact to the nearshore marine environment and will result in compensatory program on the reef flat that will provide a net gain of 15,742 s.f. years to the reef flat marine environment.

3.10 NATURAL RESOURCES AND WATER QUALITY

3.10.1 Affected Environment

A shallow marine plateau, which extends across the `Au`au Channel to Lana`i, underlies the waters off Lahaina, which reaches depths of 600 feet in the Pailolo Channel, between the islands of Lana`i and Kahoolawe. The waters offshore from Lahaina were referred to as the "Lahaina Roads" by mariners from the time of the whaling era. Bounded by the islands of Maui, Moloka`i, Lana`i, and Kahoolawe, these waters are relatively calm and are well-protected from ocean swells from most directions except from the south and southwest. Winds over this area tend to be light resulting in generally mild seas, which can become rough and choppy due to gusty local wind conditions. Shallow water reefs along the coastline are few in number and typically narrow in width where they do occur. The nearshore bottom consists primarily of hard consolidated coralline pavement interspersed with sand pockets, coral growth, and terrestrial sediment. Prevailing coastal currents in the Lahaina area are largely induced by the tides. The currents generally parallel the shore, setting northerly with the ebbing tide and southerly with the flooding tide.

The LSBH is sheltered by shallow reef systems, approximately 1,000 feet in width, running from the north to the south side of the harbor. The entrance channel is formed from the natural break between two (2) of the reef systems, which runs from Kaua'ula Stream in the south and ends near Mala Wharf in the north (Sea Engineering and AECOS, 1994).

The existing, dredged harbor entrance channel is approximately 14 feet below the mean lower low water height (MLLW), although a portion of the channel runs deeper, to approximately 18 feet MLLW. The bottom of the entrance channel and of the harbor basin largely consists of sand. The adjacent reef has a more complex bottom composition, consisting of a mixture of limestone boulders and outcrops and sand. Refer to **Appendix "C"**.

Wave action in the project area is affected by the reef flats; water over the reefs tends to drain into the entrance channel, flowing out to sea through the channel. Sand also follows this pattern and moves from the nearshore reefs into the deeper off-shore areas. These processes are typical of windward shorelines with these bathymetric conditions.

The first 165 feet (50 meters) along the north side of the harbor channel is primarily rubble (43 percent) and hard rock (40 percent), often with a layer of sand covering a thin, algae layer. The next most abundant bottom type is sand (16 percent cover), followed by live coral (1 percent cover). The shoreline in the location of the proposed ferry pier is 100 percent sand cover.

A water quality survey of the LSBH was prepared by AECOS, Inc. in May, 2005. Refer to **Appendix "D"**. Water samples were collected from two (2) stations located within the harbor at different tidal stages. Station One was located immediately off-shore, just south of the Hauola Stone. Station Two was located along the harbor entrance channel at the end of the breakwater. Some water quality parameters were measured in the field while other samples were collected, cooled on ice, and taken to a laboratory for measurement. The report notes that the survey was performed during a relatively wet month for West Maui.

The survey consisted of analyses for various indicators of water quality, including the quantity of dissolved oxygen, pH, chlorophyll, turbidity, and total suspended solids (TSS). The results of the survey were largely consonant with the data collected by the State of Hawai`i, Department of Health, from 1989 to 1998. The amounts of total nitrogen and total phosphorous measured were greater than the geometric mean of the State's data, but not beyond the range of their measurements. The samples appear to have been minimally influenced by stormwater runoff and the resuspension of sediments from the bottom of the harbor.

It is noted that the LSBH is listed as an impaired body of water by the State due to turbidity. The waters of the LSBH are also classified as essential fish habitat by the National Marine Fisheries Service and Class "A" by the Department of Health. The objective for the Class "A" water is to protect their use for recreation and aesthetic qualities.

3.10.2 Environmental Consequences

Approximately 2,500 cubic yards of material will need to be dredged from the LSBH to provide the required draft for vessels to utilize the new pier. Dredging will involve deepening and widening of the entrance channel and berthing area to the north of the proposed new ferry pier. See **Figure 13**. It is estimated the dredging period will be approximately two (2) to three (3) months.

The pier will be located inshore of the entrance to the boat basin and will not alter current littoral processes or circulation patterns on the reef. As dredging would be largely confined to the inshore terminus of the entrance channel, surfing sites located at the reef are also anticipated to be unaffected by the proposed project alternative.

Construction-related activities will result in short-term increases in turbidity. The use of Best Management Practices (BMPs) such as silt curtains can mitigate increased turbidity. The proposed dredged material disposal site will be on land at the Kahului Harbor. There are no long-term impacts to water quality anticipated from construction-related activities.

If harbor activity were to increase, this may increase impacts to the nearshore marine environment due to increased levels of pollutants emitted by water craft. However,

Source: EKNA Services, Inc.

Figure 13 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Lahaina Small Boat Harbor

Limits of Dredging

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/sitealternative

the proposed project is not intended to expand harbor operations, but to more adequately meet existing levels of activity.

The pile supported pier as proposed in Alternative 3 would be open underneath the pier and would be less likely than Alternatives 1 and 2 to affect existing wave and circulation patterns within the entrance of the channel. Moreover, Alternative 3 would allow the sediments to be carried from the reef flat into the channel and accumulate more evenly over the entire dredged area on the north side of the existing pier.

Early coordination with Federal and State agencies has been carried out pursuant to the Memorandum of Understanding, National Environmental Policy Act and the Clean Water Act, Section 404, Integration Process for Surface Transportation Projects in the State of Hawai`i pertaining to waters of the U.S. and sensitive species. The coordination objective is to seek concurrence from the agencies on the site and project alternatives and evaluation and selection of the least environmentally damaging practical alternative during the preparation of the EIS document.

3.11 HAZARDOUS MATERIALS

3.11.1 Affected Environment

Potential hazardous materials at the LSBH related to the proposed improvement alternatives to the interisland ferry facilities include potential hazardous material in the dredged material, the removal of piles from the existing dolphins which supports the walkway to the former Carthaginian II vessel, and potential hazardous material in the existing Harbor Master's office and ferry ticket booth. The existing building may contain asbestos, lead based paint and/or PCB building materials.

3.11.2 Environmental Consequences

Dredged Materials

There should be no contaminants in the sand or dredged limestone reef, because there are no land sources of pollutants in the immediate area. The area to be dredged is outside the harbor basin and exposed to significant wave activity and currents that flush the channel and promote good water quality. The dredged material will be transported to the DLNR's approved land disposal site at Kahului Harbor. This site has been used for stockpiling/disposal of dredged materials from prior construction of the boat launch ramp facility at the site.

Removal of Piles

The existing piles to be removed for the construction of the new ferry pier may contain wood preservatives (semi-volatile organic compounds such as creosote). Such wood products may be disposed to a landfill as demolition debris provided that the results of Toxicity Characteristic Leaching Procedure (TCLP) testing establishes that the debris does not leach these compounds in excess of regulatory limits. Such testing will be conducted during the design phase. If the TCLP results exceed regulatory limits, then the piles must be appropriately packaged and shipped to an approved hazardous waste disposal facility.

Building Demolition

The buildings that are to be demolished (existing Harbor Master's office and ferry ticket booth) may contain asbestos, lead paint, and PCB-containing fluorescent light ballasts. A survey of potential hazardous building materials will be conducted during the design phase. Asbestos-containing building materials will be removed and disposed of, by licensed and trained asbestos abatement contractors, in accordance with plans and specifications based on all applicable laws and regulations pursuant to Asbestos Hazard Emergency Response Act (AHERA), CFR 40 part 763 and National Emission Standard for Hazardous Air Pollutants (NESHAP), CFR 40 Part 61. Lead-containing paint is likely to be present on the building structures. The demolition debris may be disposed to a landfill provided that the results of TCLP testing establishes that the debris does not leach lead in excess of regulatory limits. Such testing will be conducted during the design phase. TCLP results of composited demolition debris from building structures normally do not exceed regulatory limits. Fluorescent light ballasts that do not have a label "contains No PCBs" are assumed to contain PCB. Such ballasts will be disposed of in accordance with plans and specifications based on all applicable laws and regulations.

Alternatives 1, 2, and 3 are similar in the degree and amount of dredging, and their requirement of the demolition of existing mooring dolphins, Harbor Master's office and ferry ticket booth. Alternative 3 will have more area of sand disposal due to the core from drilling and setting the piles than Alternatives 1 and 2 which do not have piles. The existing building materials will be surveyed and tested for hazardous materials. If found, proper disposal requirements, in accordance with applicable State and Federal regulations, will be included in the contract plans and specifications.

3.12 CUMULATIVE AND SECONDARY IMPACTS

3.12.1 Cumulative Impacts

Project Alternatives 1, 2, and 3 are intended to address existing operational limitations at the LSBH.

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency or person undertakes such other actions.

Project Alternatives 1, 2, and 3 are not part of a larger action, nor would they occur within the context of such actions. There are no direct community growth impacts resulting from or occurring with project Alternatives 1, 2, and 3. There are no other public works projects anticipated within the project alternatives contexts.

3.12.2 Secondary Impacts

Secondary impacts are those which have the potential to occur later in time or farther in distance, but are still reasonable forseeable. They can be viewed as actions of others that are taken because of the presence of the project. Secondary impacts from highway projects, for example, can occur because they can induce development by removing one of the impediments to growth-transportation access.

There are no foreseeable, adverse secondary impacts associated with the project Alternatives 1, 2, or 3. They are not considered a generating component for population, nor will they place additional burden upon infrastructure or the environment. The moorage capacity of the LSBH will not be increased by the proposed improvements. The new ferry pier will relieve congestion at the existing harbor. The new ferry pier is designed to better accommodate existing demand at the LSBH rather than to allow increased usage. There are no plans to expand the ferry service running to and from the LSBH or to expand the harbor to accommodate additional vessels.

4. TRANSPORTATION SYSTEMS

4. TRANSPORTATION SYSTEMS

4.1 HIGHWAY

4.1.1 Traffic Conditions and Impacts

Due to its scenic location in an area of historic sites, retail shops, restaurants, and ocean recreational activities, the harbor area attracts a great number of visitors. Typically, local streets and on-street parking stalls in the area are well-used by visitors, as well as by residents and employees who visit and work in the area. Traffic volumes and parking space use in the area increases during peak visitor seasons and on Boat Days (days when cruise ships are anchored offshore).

As previously mentioned, the proposed ferry pier improvements are intended to accommodate existing use by recreational and commercial vessels, including cruise ship tenders and interisland ferries and is not anticipated to generate additional trips to or from the harbor. A Traffic Impact Analysis Report (TIAR) for the LSBH was carried out by Wilson Okamoto Corporation in May 2006 in order to identify opportunities to improve vehicular traffic and pedestrian flow in and around the LSBH. See **Appendix "F"**. The objective of this report was to identify current Levels of Service and traffic volumes and project future traffic conditions and Levels of Service in the year 2010, which was selected as the traffic horizon year for comparative purposes. Levels of Service (LOS) is a quantitative and qualitative assessment of traffic operations defined from LOS "A" through to "F", representing ideal or free flow traffic operating conditions to unacceptable or potentially congested traffic operation conditions, respectively. Field investigations consisted of observations of traffic conditions and manual turning movement count surveys in the project vicinity during Boat Days and Non Boat Days. Currently, most vehicles accessing the harbor area enter via Hotel Street, turn left onto Wharf Street, turn left onto Canal Street, and exit via Front Street. During Boat Day, this is the only access and egress route, since the north end of Wharf Street is blocked off to create a security zone for the pier. The proposed improvements to the passenger loading/unloading area would allow vehicular traffic to make a right-turn from Hotel Street onto Wharf Street, to access the passenger loading/unloading area and exit the harbor via Papalekane Street. This improvement is anticipated to reassign approximately 20 percent of the exiting traffic through to Papalekane Street and onto Front Street.

The existing and projected levels of service on a Boat Day is presented in **Table 4**.

Table 4. Existing and Projected Levels of Service on "Boat Day"

Intersection	Critical Movement		AM Existing	AM Year 2010 w/Project	PM Existing	PM Year 2010 w/Project
Front St./ Hotel St.	Northbound	LT-TH	A	A	A	A
Front St./ Canal St.	Eastbound	LT	B	B	C	C
		RT	A	A	B	B
Front St./ Prison St.	Westbound	LT-RT	C	C	C	C
	Southbound	LT-TH	A	A	A	A
Prison St./ Wainee St.	Eastbound	LT-TH-RT	A	A	A	A
	Westbound	LT-TH-RT	A	A	A	A
	Northbound	LT-TH-RT	C	C	B	B
	Southbound	LT-TH-RT	B	B	C	C
Prison St./ Honoapi`ilani Hwy.	Eastbound	TH-RT	B	B	C	C
	Westbound	LT-TH-RT	B	B	B	B
	Northbound	LT	A	A	B	B
Front St./ Dickenson St.	Westbound	LT-RT	B	B	D	D
	Southbound	LT-TH	A	A	B	B
Dickenson St./ Wainee St.	Eastbound	LT-TH-RT	A	A	B	B
	Westbound	LT-TH-RT	B	B	C	C
	Northbound	LT-TH-RT	B	B	C	C
	Southbound	LT-TH-RT	B	B	C	C
Dickenson St./ Honoapi`ilani Hwy.	Eastbound	LT-TH-RT	D	D	D	E
	Westbound	LT-TH-RT	D	D	D	D
	Northbound	LT	D	D	D	E
		TH-RT	D	D	D	E
	Soutbound	LT	D	D	D	E
		TH-RT	C	B	C	B
Source: Wilson Okamoto Corporation, 2006						

As indicated by the assessment, LOS at the following intersections: Front Street/Hotel Street, Front Street/Canal Street, Front Street/Prison Street, Prison Street/Wainee Street, Prison Street/Honoapi`ilani Highway, Front Street/Dickenson Street and Dickenson Street/Wainee Street, are anticipated to operate in a range of LOS A to D, which are acceptable traffic conditions. The only intersection in the study area which will not meet acceptable LOS is the Dickenson Street/Honoapi`ilani Highway intersection. The TIAR notes traffic operations in the vicinity of the LSBH are expected to remain similar to "existing conditions" and to "future conditions without the project", and therefore, no traffic mitigation is recommended.

In general, the proposed improvements on Wharf Street and Papalekane Street, which are common to all pier development alternatives, will improve pedestrian and vehicular traffic flow from existing conditions. In Alternative 1, the access ramp to the pier will directly load and off-load passengers onto the harbor bulkhead near Wharf and Papalekane Streets. The off-loading ferry passengers could potentially disrupt vehicular traffic flow along these streets for a limited time. However, with the Harbor Master's office and ferry ticket booth located on the new pier, pedestrian congestion at the existing pier will be reduced in Alternative 1.

4.1.2 Parking Demand and Supply

Within the LSBH area, there are a number of available parking stalls provided by both off-street parking lots and on-street parking. Based on a survey carried out by the DLNR, there are approximately 690 marked parking stalls, 40 unmarked parking stalls, 10 bus parking stalls, and 6 limousine parking stalls in and around the LSBH. Results of the survey indicate there are enough parking stalls in proximity to the ferry terminal to accommodate related parking requirements. The Expeditions Ferry service to Lana`i has an arrangement with a nearby parking lot for overnight parking. In addition, proposed improvements to the ferry loading and unloading area should help facilitate traffic flow and circulation and passenger convenience.

Pedestrian traffic in the vicinity of the LSBH is fairly high. Approximately 862 pedestrians in the AM peak period and 1,115 pedestrians during the PM peak periods were observed traveling along Hotel Street on a Boat Day. The pedestrian traffic often conflicts with turning vehicular traffic at the intersection along Hotel Street and Wharf Street. As such, modifications to widen the existing pedestrian sidewalk along the northwest side of Hotel Street has been incorporated into the proposed development alternatives to facilitate pedestrian movement.

Appropriate traffic management controls will be utilized during the construction period to minimize impacts to vehicle and pedestrian traffic flow in the area. A traffic management and mitigation plan will be submitted for review and approval during the building permit application process. The plan will identify traffic control measures to direct vehicular and pedestrian traffic flows and identify parking for construction-related vehicles and personnel to prevent increased congestion in the harbor area.

4.2 TRANSIT

4.2.1 Services and Operations

Currently, there is a public transit system providing passenger service from Kahului to Lahaina and to Napili to the north. The service runs every hour from 6:00 a.m. to 7:00 p.m. The bus stops at the Lahiana Wharf Cinema Complex located on Front Street across from the LSBH.

The County of Maui is also planning to initiate a public transportation service for the core commercial area of Lahaina. This service is intended to divert traffic and parking from the Lahaina commercial/retail center to a commuter parking facility located to the east of Honoapi`ilani Highway and Lahainaluna Road. A large public parking facility would provide a convenient parking area for visitors outside the downtown core and a fleet of busses would shuttle people from the parking lot to the commercial retail center of Lahaina and the LSBH. This public transit service would help relieve parking and traffic congestion in the center of Lahaina Town.

4.2.2 Ridership

The public transportation system from Kahului to West Maui has been in operation since July 2004. There are two (2) 35-passenger buses servicing the route. Ridership is steadily increasing.

4.3 FREIGHT MOVEMENTS

Currently, the interisland commuter ferries carry a small amount of freight to and from the islands. This freight is either hand carried by passengers or loaded onto the ferry by the shipper and picked up at either Lana`i or Moloka`i. Ferry crew help load freight by hand. There is no facility to load or unload freight. Therefore, freight is limited to what can be easily handled by one person. Alternative 1 would have direct access from the landside drop off along Wharf Street and offer more convenience to passengers. Alternatives 2 and 3 both have an access ramp from the existing pier and loading hand held freight may not be as convenient as Alternative 1. Alternative 4 would maintain existing conditions which limit traffic circulation around the LSBH facilities and does not provide convenient loading and unloading areas. Alternatives 1, 2 and 3 have common landside improvements which provide improvements to traffic circulation, passenger loading and unloading from the existing conditions.

5. EVALUATION OF ALTERNATIVES

5. EVALUATION OF ALTERNATIVES

5.1 NEPA EVALUATION

5.1.1 Performance in Satisfying Purpose and Need

The State of Hawai`i, Division of Boating and Ocean Recreation (DOBOR) has established the following project purpose and need for the LSBH:

a. Provide a safe and reliable docking facility for commuter ferry operations servicing Lana`i, Moloka`i, and West Maui;

b. Promote the efficient and safe use of the existing facilities at the LSBH;

c. Comply with Hawai`i Administrative Rules (HAR) §13-230-1, Purpose and scope: "effectively control and manage the small boat harbors and facilities of the State in order that the general public may enjoy safe, orderly and convenient water recreation"; and

d. Comply with Hawai`i Revised Statutes (HRS) §200-9 Purpose and use of State small boat harbors which states: "State small boat harbors are constructed, maintained, and operated for the purposes of: (1) Recreational boating activities; (2) Landing of fish; and (3) Commercial vessel activities".

Alternatives 1, 2, and 3 would equally meet the project purpose and need for improved safety at the LSBH and to provide safe and readily available loading and unloading docking facilities for the interisland ferry service. Alternatives 1, 2, and 3 would also equally comply with the program purpose governing the use of State small harbors for recreational boating, landing of fish and commercial vessel activities. Alternative No. 4 would not address the project purpose and need.

5.1.2 Comparative Benefits and Environmental Effects

5.1.2.1 Neighborhoods and Communities

Alternatives 1, 2 and 3 would provide equal benefits to the LSBH neighborhood by improving vehicular and pedestrian traffic circulation in and around the harbor, notably along Hotel Street, Wharf Street, Canal Street and Papalekane Street. Alternatives 1, 2 and 3 would also provide benefits to the Lana`i and Moloka`i communities, whose residents use the interisland commuter ferry, by improving harbor safety conditions and providing more convenient loading and unloading areas. Alternative 4 does not benefit the neighborhoods and communities and maintains existing conditions at LSBH.

With respect to environmental effects, Alternative 1 would compromise the integrity and setting of the historic seawall by building the access ramp over the top of the seawall. The two-story Harbor Master office and ferry terminal facilities would also alter the historic character of Lahaina Town and obstruct ocean views from the adjacent upland area. The open shade structures proposed in Alternatives 2 and 3 are single story and would have a lower profile roof line than Alternative 1 and, therefore, less of an obstruction to ocean views. Furthermore, the roof of the open shade structure has been reduced by incorporating two (2) smaller roofs separated by a trellis which provides a view corridor between the roof structures.

In connection with the preparation of this document, coordination has been undertaken with the USFWS, Environmental Protection Agency, NMFS, U.S. Department of the Army, the State Department of Health, and the State Office of Planning for permitting requirements relating to work within waters of the United States, as well as Clean Water Act, Section 404, Section 401 Water Quality Certification and Coastal Zone Management Consistency Approval requirements. These regulations and permitting requirements will be required for all project alternatives.

5.1.2.2 Land Use and Economic Development

Alternative 4 is in compliance with existing State Land Use and County community plan designations and County zoning. The land side improvements associated with Alternatives 1, 2 and 3 are located in the State Land Use "Urban" district and in compliance with the urban designation. Implementation of Alternatives 1, 2, and 3 would require a Conservation District Use Permit (CDUP) to cover the dredging activities associated with widening and deepening the entrance channel and berthing area and pier construction which are located in the State Land Use "Conservation" district. Based on the analysis of the alternatives with respect to the permitted uses in the resource subzone of the Conservation district, each of the alternatives (1, 2 and 3) meet the criteria for a CDUP.

The West Maui Community Plan land use designation for the LSBH is Park (PK). The proposed land side development for Alternatives 1, 2 and 3 are in compliance with the community plan land use designation.

The LSBH is County zoned Lahaina Historic District 1. Alternatives 2 and 3 are more in the architectural character with the Lahaina Historic District. The massing of the two-story structure in Alternative 1 would be more difficult to integrate into the historic character of historic district buildings. In addition, development of the ferry ticket booths and Administration office, and the open shade structure on the new ferry pier proposed in Alternatives 2 and 3 would establish a historic design theme at the LSBH and integrate the improvements with the architectural style of the historic district.

In the context of economic development, Alternative 1 would provide the greatest economic impact due to its higher capital cost of $8.8 million. Alternative 3 would have the second greatest economic benefit with a capital cost estimate of $8.3 million. Alternative 2 would be next with an estimated capital cost of $7.7 million. Alternative 4 would have the least economic benefit since no capital costs will be required.

5.1.2.3 <u>Land Acquisition, Displacement, and Relocation of Existing Users</u>

Land acquisition will not be required for the implementation of any of the alternatives, nor will there be any displacement or relocation of existing users. The additional land to expand the new interisland ferry pier and berthing area to the north of the existing pier is owned by the State of Hawai`i.

5.1.2.4 <u>Historic, Archaeological, and Cultural Resources</u>

Alternative 1 may potentially impact cultural site 2951(Hauola Stone) more than Alternatives 2 and 3, since the access ramp to the pier is closer to the site. Alternative 1 would also compromise the integrity of the historic seawall since the access ramp will be built over the top of the seawall. Alternatives 2 and 3 would not impact the historic seawall since the access to the new pier would be provided from the existing pier.

Based on the marine processes and circulation around the harbor entrance, the wave build up which causes the two (2) surf sites located outside will not be adversely impacted by the development of the ferry pier alternatives. However, because the pile supported pier would allow the water within the harbor to pass underneath and will not alter the circulation pattern, Alternative 3 would have the least potential risk to affecting marine processes and circulation within the harbor.

5.1.2.5 <u>Visual and Aesthetic Qualities</u>

Alternative 1 with the two-story building would have greater impact on the visual and aesthetic qualities than Alternatives 2 and 3. The low-rise open sided structure of Alternatives 2 and 3 would provide for view corridors over and between the roof structures. Alternative 3, with the pile supported pier, would allow views of the water and marine life underneath the pier and attached to the piles. Alternatives 1 and 2, with the sheet pile design, would not would have less of a visual quality to view the ocean and marine life.

5.1.2.6 Park Lands and Recreation Areas

Alternatives 1, 2 and 3 would benefit park land and recreation areas by providing a new pier which can be used by boaters for loading and unloading when not in use by the interisland ferries and at the same time relieve overcrowding within the existing harbor. Alternative 1 would provide more benefit to the park land and recreational areas around the LSBH than Alternatives 2 and 3, due to building the existing Harbor Master's office and the ferry ticket booths on the new pier, thereby creating additional useable docking and loading space at the existing pier.

5.1.2.7 Air Quality and Energy

Alternatives 1 and 2 will have more construction-related impacts on air quality due to the fill placement under the new pier. Alternative 1 will use more energy than Alternatives 2 and 3 due to the size of the enclosed area for the Administration office and ferry ticket offices on the second story of the pier building.

5.1.2.8 Noise and Vibration

Alternatives 1 and 2 will have more noise and vibration impacts due to the setting of the sheet pile walls. Due to adverse impacts caused by the driving of piles in Alternative 3, it is proposed the piles will be set in place by drilling and filling in around the piles.

5.1.2.9 Biological Resources

Alternatives 1 and 2 will result in a net loss of 166,155 s.f. years of sand resource. Alternative 3 will result in a loss of 116,845 s.f. years of sand resource. Alternative 4 will have no net loss of the sand resource.

Alternatives 1 and 2 will result in a loss of 17,080 s.f. years of piling resource. Alternative 3 will result in a net gain of 60,309 s.f. years of piling resource. Alternative 4 will result in no net loss of the pile resource.

Alternatives 1, 2 and 3 will result in a loss of 89,281 s.f. years of reef flat resource. However, with compensatory action in the nearby reef flat, this loss can be mitigated and result in a net gain of 15,742 s.f. years of reef flat habitat. Alternative 4 will result in no net loss or gain of the reef flat resource.

5.1.2.10 Natural Resources and Water Quality

The LSBH is listed as an impaired body of water by the State Department of Health due to turbidity. The coastal waters fronting the LSBH are also classified as essential for habitat (Class "A") by the National Marine Fisheries Service. Alternatives 1, 2, and 3 will remove approximately 2,500 cubic yards of material largely composed of sand and some reef material to deepen the harbor entrance channel and berthing area north of the new pier. Alternative 3 would have less effect on wave and circulation patterns within the harbor since it would allow water to circulate under the new pier. As such, Alternative 3 would allow sediments to be carried from the reef flat and into the channel to maintain the flushing action created by the flow of water in the vicinity of the new pier. Alternatives 1 and 2, with the sheet pile wall, would restrict the flow of water under the pier and allow sediments to accumulate at the sheet pile wall. Thus, the operations and maintenance of sand removal from the berthing area may be higher with Alternatives 1 and 2.

The dredging of the channel and berthing area required for Alternatives 1, 2 and 3 would increase turbidity during construction. Exceedences in water quality standards for turbidity may be expected during construction. The drilling of the piles in Alternative 3 would also increase turbidity during construction.

5.1.2.11 Hazardous Materials

Alternative 3 will have more sand disposal due to the removal of sand to set the piles supporting the pier. The removed sand will be loaded on a tanker barge and shipped to an approved disposal site. Alternatives 1, 2 and 3 may have hazardous building material disposal requirements related to the demolition of the Harbor Master office and ferry ticket booth. The demolition material will be disposed at an approved demolition waste site.

5.1.3 Irreversible and Irretrievable Commitment of Resources

The development of a new interisland ferry pier and related upland improvements are anticipated to result in the irreversible and irretrievable commitment of marine and fiscal resources. Alternatives 1 and 2 would result in a net loss of 166,155 s.f. years of sand habitat and 17,080 s.f. years of piling habitat. Alternative 3 would result in a loss of 116,845 s.f. years of sand habitat and a net gain of 60,309 s.f. years of piling habitat. Alternatives 1, 2 and 3 would result in the removal of 2,720 reef flat community which is equivalent of 89,281 s.f. years of reef flat habitat. The loss of the reef flat habitat can be mitigated by a compensation plan in a nearby area of the reef flat habitat which will result in a net gain of 15,742 s.f. years of reef flat habitat. Alternative 1 and 2 may alter the existing water circulation patterns in the channel. Alternative 1 would result in the commitment of $8.8 million in capital construction costs. Alternative 2 would result in the commitment of $7.7 million in capital construction costs. Alternative 3 would result in the commitment of $8.3 million in capital construction costs. Alternative 4 would result in no capital construction cost.

5.2 ALTERNATIVE EVALUATION SUMMARY

The evaluation of Alternatives 1, 2, 3, and 4 pursuant to the NEPA criteria is summarized in **Table 5**, below.

Table 5. NEPA Alternative Evaluation Summary

Evaluation Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4
5.1.1 Satisfying Purpose and Need	Yes	Yes	Yes	No
5.1.2 Benefits and Environmental Effects				
5.1.2.1 Neighborhood and Communities	a. 2-story building not in historic character b. Access ramp compromises integrity of historic seawall	a. Lower profile span structure can be designed in Lahaina architectural style b. Does not compromise seawall	a. Lower profile open structure can be designed in Lahaina architectural style b. Does not compromise seawall	a. Existing Harbor Master office does not architecturally conform b. Does not compromise seawall
5.1.2.2 Land Use and Economic Development	a. Meets land use plans and criteria b. Capital cost \$8.8 million	a. Meets land use plans and criteria b. Capital cost \$7.7 million	a. Meets land use plans and criteria b. Capital cost \$8.3 million	a. Meets land use plans and criteria b. No capital cost benefit
5.1.2.3 Land Acquisition and Displacement	No	No	No	No
5.1.2.4 Historic Archaeological and Cultural Resources	a. Historic seawall- Yes b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No	a. Historic seawall- No b. Archaeological Resources- No c. Historic sites- No
5.1.2.5 Visual and Aesthetic Qualities	a. 2-story building will impact visual quality b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - Yes	a. Visual qualities - No b. Aesthetic qualities - No
5.1.2.6 Park Lands and Recreation Areas	a. Reduces congestion in harbor b. More open area on existing pier	a. Reduces congestion in harbor b. Less open area on existing pier	a. Reduces congestion in harbor b. Less open area on existing pier	a. Does not reduce congestion b. Does not result in improvements to park land and recreation areas
5.1.2.7 Air Quality and Energy	a. Short-term impact on air quality during filling behind sheet wall b. Energy use higher due to larger building	a. Short-term impact on air quality during filling behind sheet wall b. Some increase in energy use with expansion of Harbor Master office	a. No filling under pier required b. Some increase in energy use with expansion of Harbor Master office	a. No construction b. No change in energy use

Evaluation Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4
5.1.2.8 Noise and Vibration	a. Yes - short term during construction b. Yes - vibration due to driving sheet wall	a. Yes - short term during construction b. Yes - vibration due to driving sheet wall	a. Yes - short term during construction b. No - piles will be drilled	a. No construction noise b. No vibration
5.1.2.9 Biological Resources and Water Quality	a. Loss of 166,155 s.f. years of sand b. Loss of 17,080 s.f. years of piling resource c. Loss of 89,281 s.f. years of reef flat resource d. Short term increase in turbidity during dredging	a. Loss of 166,155 s.f. years of sand b. Loss of 17,080 s.f. years of piling resource c. Loss of 89,281 s.f. years of reef flat resource d. Short-term increase in turbidity during dredging	a. Loss of 116,845 s.f. years of sand b. Gain of 60,309 s.f. years of piling resource c. Loss of 89,281 s.f. years of reef flat resource d. Short term increase in turbidity during dredging	a. No loss of sand b. No loss of piling resource c. No loss of reef flat resource d. No dredging
5.1.2.10 Natural Resources and Water Quality	a. Dredging of 2,500 c.y. of material b. Short term increase in turbidity during dredging	a. Dredging of 2,500 c.y. of material b. Short-term increase in turbidity during dredging	a. Dredging of 2,500 c.y. of material b. Short term increase in turbidity during dredging	a. No dredging
5.1.2.11 Hazardous Material	a. Removal of dredged soils b. Removal of Harbor Master's office	a. Removal of dredged soils b. Removal of Harbor Master's office	a. Removal of dredged soils b. Removal of Harbor Master's Office	a. No removal of dredged soils b. No removal of Harbor Master's Office

Based on the comparative benefits and environmental effects, Alternative 1 has greater economic benefit than Alternatives 2, 3 and 4 due to the increased capital cost. Although Alternative 4 has the least environmental effects, it does not satisfy the project purpose and needs. The two-story building proposed in Alternative 1 would impact the character of the neighborhood and the visual and aesthetic qualities of the area more than Alternatives 2 and 3. In addition, the Alternative 1 access ramp connecting to the harbor bulkhead will be built over the historic seawall and would compromise the historical integrity of the seawall. Alternatives 2 and 3 share some of the same features with respect to comparative evaluation of land use and economic development and historic, archaeological and cultural resources criteria. However, Alternative 3 has the least quantitative impact with respect to biological resources and impacts on air quality and energy. Alternative 3 is, therefore, deemed to be the "Least Environmentally Damaging Practicable Alternative" (LEDPA) that is capable of implementation taking into consideration cost, existing, technology, environmental mitigation and logistic in light of meeting the overall project purpose.

The commitment of the resources associated with the preferred alternative, however, is considered appropriate when evaluating the benefits to be derived from the proposed project versus the consequences of taking no action. Irretrievable commitments of sand and reef flat habitat resources lost due to dredging will be mitigated by equivalent marine habitat restoration.

6. 49 U.S.C. §303 (SECTION 4(F)) EVALUATION

6. 49 U.S.C. §303 (SECTION 4(F)) EVALUATION

Regulatory provisions of 49 U.S.C. §303 (formerly Section 4(f) of the Department of Transportation Act of 1966) was enacted in an effort to preserve the natural resources of public park and recreation lands and historic sites in relation to federal transportation plans and programs. As the subject action uses Federal transportation funds and involves work in the Lahaina National Historic Landmark District, the following Section 4(f) evaluation is provided.

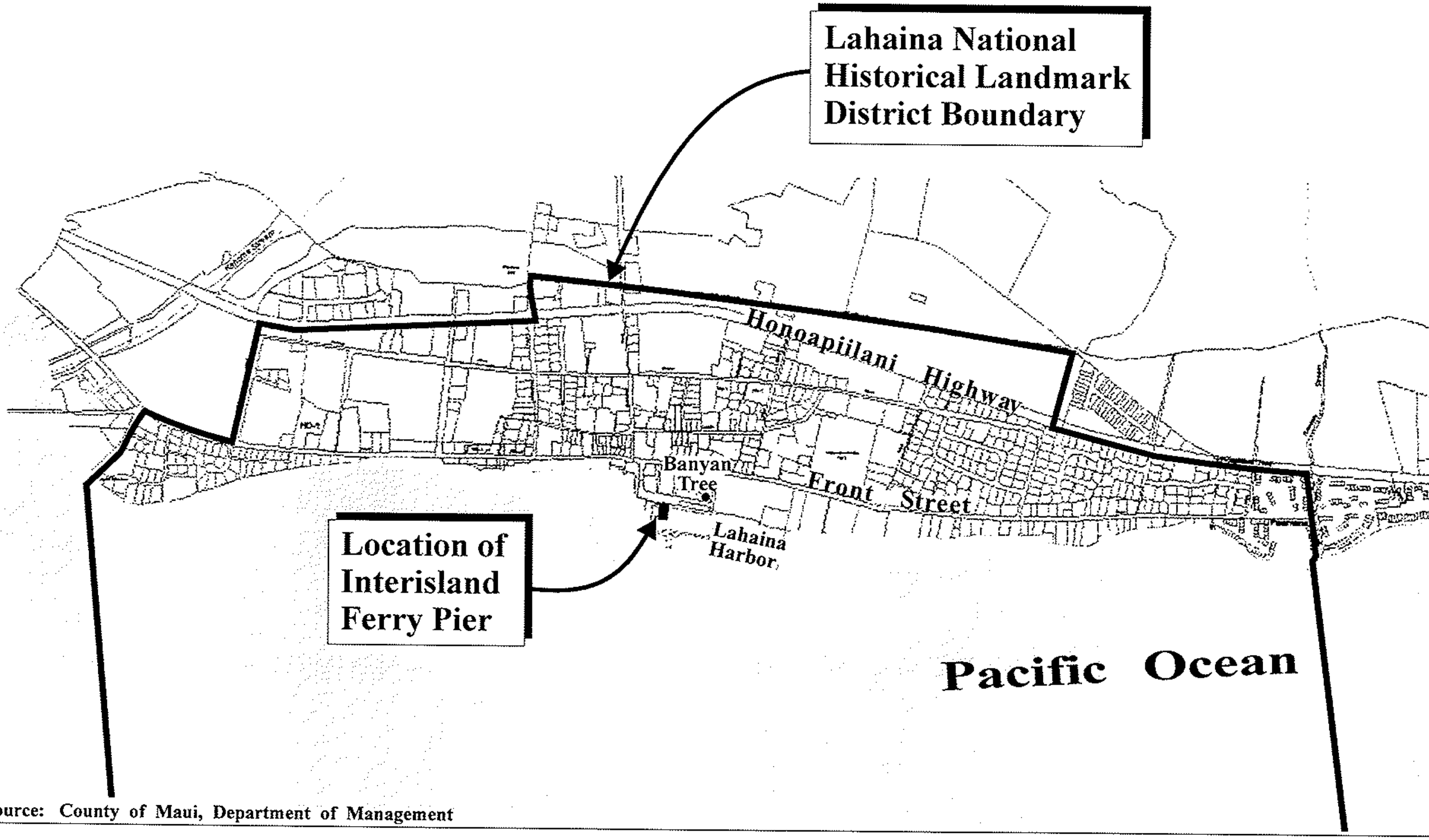
6.1 SECTION 4(F) PROPERTY

The proposed action will occur in the Lahaina National Historic Landmark District. This District preserves much of the style and substance of the 19th century Lahaina Town, a whaling and agricultural center at the time. Today, Lahaina is a major tourist destination on Maui. The proposed interisland ferry pier improvements are located within the LSBH, an active maritime facility which is also an area of heavy pedestrian traffic.

The Lahaina National Historic Landmark District is a rectangular area covering approximately 33 acres of land and extending approximately one (1) mile over the ocean. See **Figure 14**. This district forms the core of Lahaina Town and contains mixed commercial, public/quasi-public, and park uses. Notable historical and cultural sites in the area include Banyan Tree Park, the Hauola Stone, the Brick Palace, and the Lahaina Courthouse. Other public uses include the LSBH and the Lahaina Library.

The major roadways in the project area are Honoapi`ilani Highway (State Highway 30) and Front Street. Honoapi`ilani Highway is the principal link between West Maui and the rest of the island. Front Street is a two-lane, County roadway that runs in a north-south direction and is the major thoroughfare through Lahaina Town.

The LSBH is located westward of Wharf and Hotel Streets, both one-lane County roadways. Front Street traffic proceeds in a westerly direction along Hotel Street to its intersection with Wharf Street. From this point, vehicles proceed either north along Wharf Street to return to Front Street via Canal Street. At the west end of Canal Street, a paved one-lane service road parallels the harbor front to provide access to berthing areas.



Source: County of Maui, Department of Management

Figure 14

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Lahaina National Historic Landmark District Boundaries

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/histland

Lahaina is a major visitor destination. There were 1,251,834 visitors to Lahaina in the year 2000 (SMS, 2002).

6.2 ANALYSIS OF SITE LOCATION ALTERNATIVES

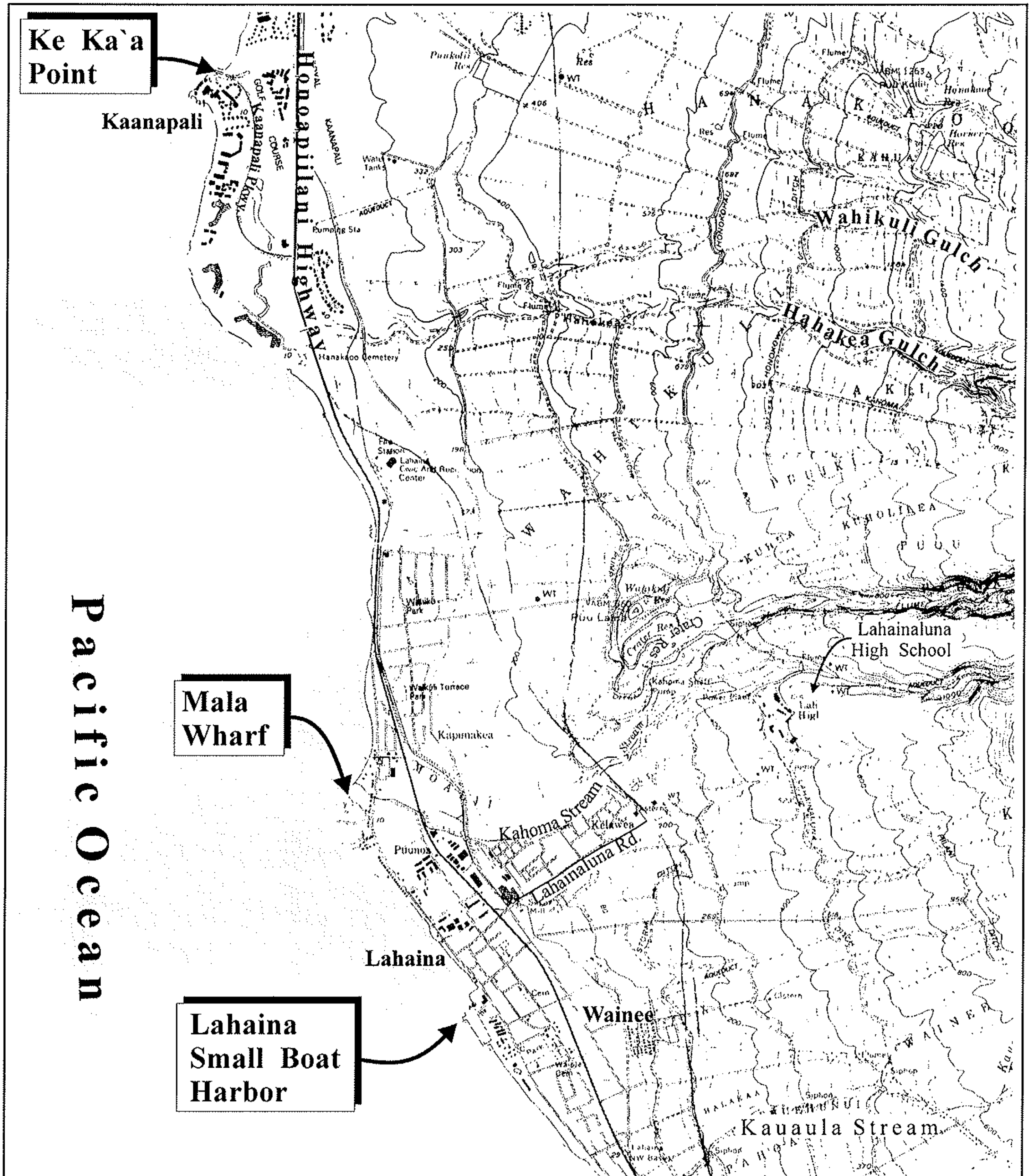
The analysis of site location alternatives includes the evaluation of sites that meet the following site selection criteria:

- Close proximity to the town of Lahaina;
- Ready access to deep water (-12' MLLW) with minimal or no dredging;
- Sheltered from tradewinds by the West Maui Mountains;
- Existing and/or historic use as a harbor, port or docking facility for vessel mooring, loading and unloading operations; and
- Paved access to existing public roadways.

Based on the above selection criteria, three (3) site location alternatives are included in the 4 (f) evaluation. The alternative sites evaluated are Lahaina Small Boat Harbor, Mala Wharf and Ke Ka`a Point. See **Figure 15**. The evaluation of the site location alternatives are described below.

6.2.1 Lahaina Small Boat Harbor (LSBH) Location Alternative

The interisland ferry services from Lana`i and Moloka`i presently load and unload at the LSBH. Proposed improvements at the LSBH include a new ferry pier with shade structure, reconfiguration of the passenger queuing area, and dredging to widen the entrance channel and berthing area. A suitable site to the north of the existing pier is available for the new ferry pier. See **Figure 16**. Access to the new ferry pier will be provided by a concrete walkway connecting to the existing pier. The walkway will be 16 feet wide and 60 feet long with safety railings and will extend parallel to the shoreline. The total volume of dredging is estimated to be 2,500 cubic yards. Refer to **Appendix "C"**. Dredging will involve deepening of the entrance channel and widening of the berthing area to the north of the new ferry pier. Refer to **Figure 13**. The first 165 feet (50 meters) along the north side of the harbor channel is primarily rubble (43 percent) and hard rock (40 percent), often with a layer of sand covering a thin algae layer. The next most abundant bottom type is sand (16



Source: U. S. Geological Service, Lahaina Quad Map

Figure 15 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Alternative Sites Location Map

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/altsites

Source: Department of Land and Natural Resources

Figure 16

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Lahaina Small Boat Harbor

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/lsbhaerial

percent sand cover), followed by live coral (1 percent coral cover). See **Figure 17**. The coral cover is made of the following species, *Monitpora capitata*, *Monipora patula*, *Pocilopora meandrina*, and *Porites Lobata*. The shoreline in location of the proposed new ferry pier is 100 percent sand cover. Refer to **Appendix "D"**. The marine survey also identified three (3) green sea turtles within the vicinity of the LSBH.

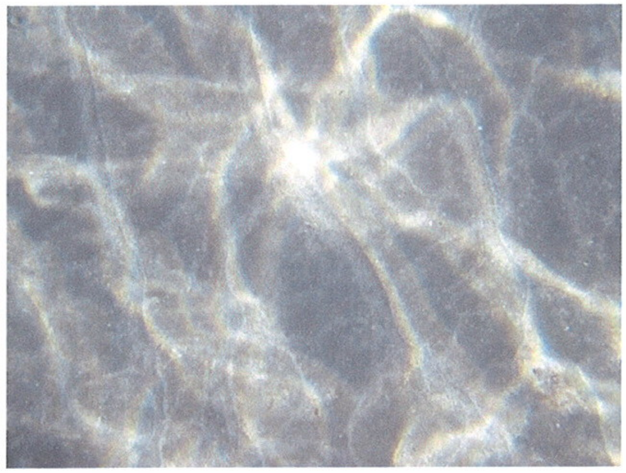
6.2.1.1 Site Evaluation

Environmental Criteria: The proposed new pier will be located inshore of the entrance to the boat basin (at the location where the Carthaginian II was berthed), and therefore, will not seriously alter the current flow and existing circulation patterns on the reef. No direct access from the shoreline to the new ferry pier will be provided in order to avoid impacting the historic seawall along the shoreline in front of the new ferry pier site. The sides of the entrance channel are more populated by corals than the reef flat itself. While dredging of the north side of the channel will remove existing corals, the re-contoured sides will offer the same opportunities for coral growth, since it would allow coral to attach to a hard substrate and be less affected by wave scour. Any additional deepening within the limits of the channel would be conducted in areas that have been previously disturbed by dredging. The dredged material in the previously disturbed areas is primarily composed of sand.

Deepening the harbor channel through dredging will cause a shift in available habitats; creating new habitats while eliminating some habitat that exists. Newly available limestone habitats are anticipated to provide for increased coral coverage, as well as increased habitats for macroinvertebrates and fish. One (1) small area from approximately 60 feet to 110 feet from the shoreline, with 7 percent of coral coverage, will be lost by dredging. However, rice coral, the dominant species of coral in this area, should quickly recolonize. This recolonization can be encouraged if dredging in this area is completed before the summer reproducing season.

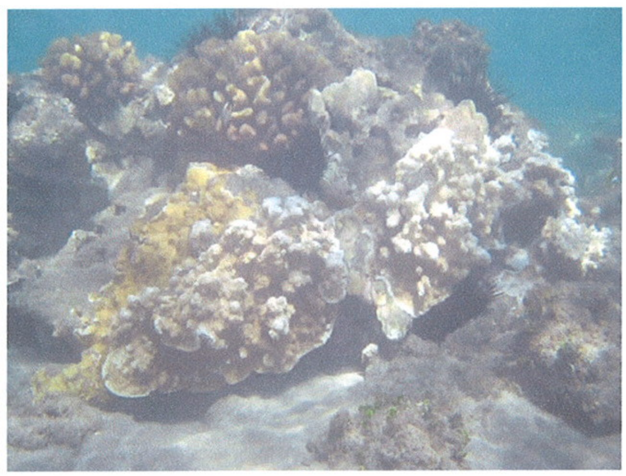
The new pier is also anticipated to remove some habitats while providing new areas for marine biota. It is noted that snowflake coral, an invasive species, may out-compete other coral species and some measure to control their reproduction may be required.

Silty Bottom



Sandy Bottom

Reef Flat Corals



Reef Flat Corals

Source: AECOS, Inc. 2005

Figure 17 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Lahaina Small Boat Harbor Marine Biology

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/LSBHmarine

Any new pier located in the entrance channel would necessarily be considered a "fair weather" facility because there is no shelter from waves. However, the reef on both sides of the entrance channel provide some protection from wave action. Any additional "hardening" of the area near the entrance to the harbor basin could affect navigability by altering wave and current patterns within the channel. Dredging will be confined primarily to the inshore terminus of the entrance channel, therefore, existing surf sites located at the reef margins will not be adversely affected. Considering the existing flows draining from the reef flat into the channel, any solid walled pier structure will likely allow sediments to accumulate on the north side of the pier.

The extent of dredging will be confined to the entrance channel. Due to the limited volume (approximate 2,500 cubic yards) of material to be dredged, the dredging time period will not be extensive and will be confined to evening hours to minimize impacts to harbor activities and appropriate seasonal construction period to avoid turtle nesting activities. Therefore, adverse impacts to rare and endangered species are not anticipated. Since the dredging will be carried out on previously altered areas and in limited areas of hard substrate on the north side of the entrance channel, no adverse impacts to cultural resources are anticipated.

Legislative Criteria: The proposed work will involve a Department of Army permit and compliance with the Clean Water Act Section 404. Early consultation with State and Federal agencies has been initiated. The proposed ferry pier will involve work within the State Land Use "Conservation" district. Therefore, a Conservation District Use Permit will be required from the State of Hawai`i, Board of Land and Natural Resources. The coastal waters of Lahaina fall within the Office of Conservation and Coastal Land's "resource" subzone. One of the identified land uses in the resource subzone is for marine construction which encompasses dredging, filling and any combination thereof involving submerged lands.

With respect to County zoning, the Lahaina Small Boat Harbor is located within the limits of Historic District No. 1. Regulations for the historic district covers a multitude of uses ranging from residential, public/quasi-public to business/commercial uses. Although the proposed improvements are a permitted use within the historic district, a Historic District approval by the Maui County Cultural Resources Commission will be required.

The Lahaina Small Boat Harbor is also located within the Lahaina National Historic District. Required coordination in compliance with Section 106 of the National Historic Preservation Act will also be carried out in connection with the EIS process.

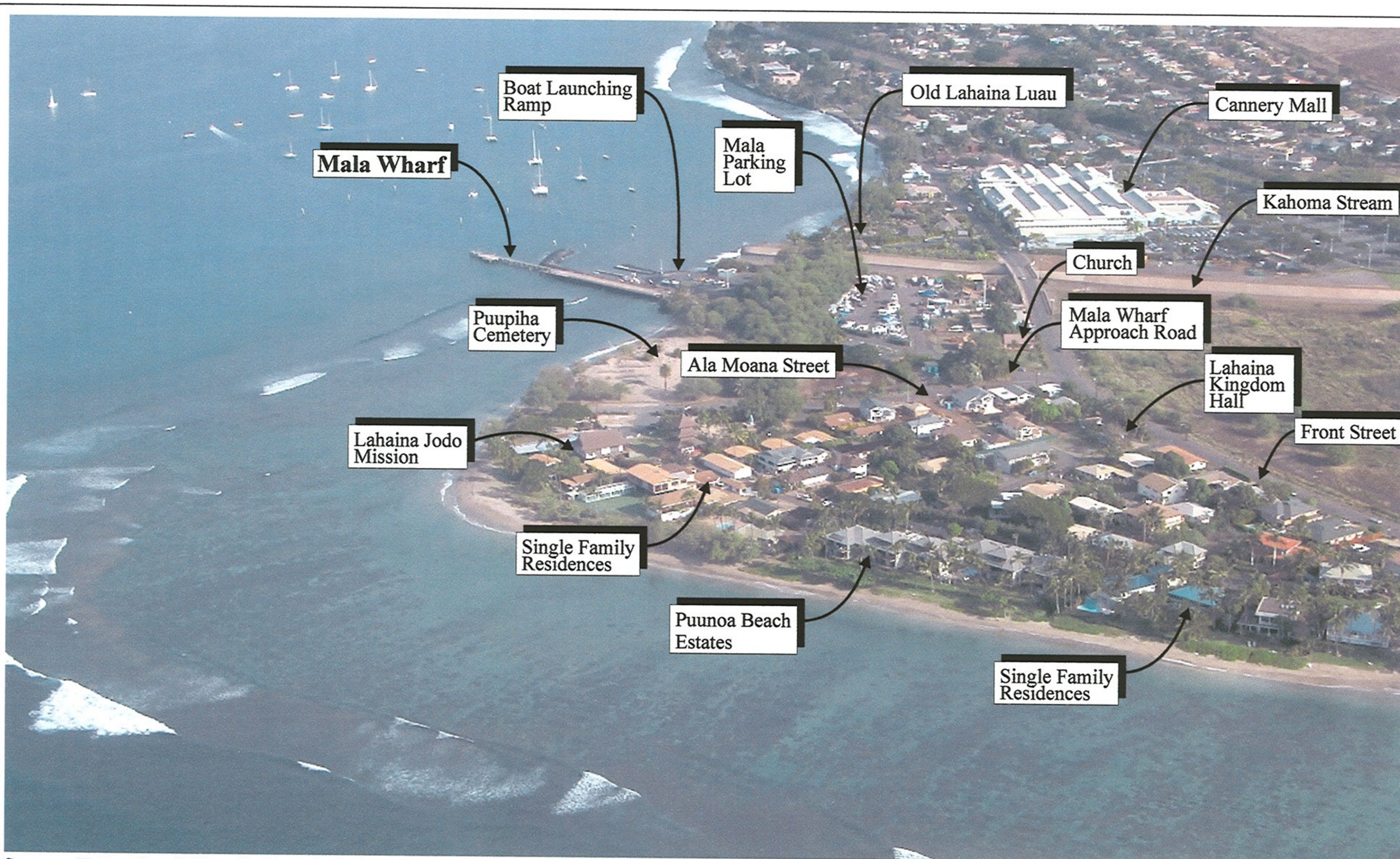
The LSBH site location would fully address the State of Hawaii's proposed plan to provide a readily accessible and safe facility for the interisland ferry.

Economic Criteria: The make up of the Lahaina/Maui ferry passenger traffic is 65 percent commuter and 35 percent tourist generated, while the Molokai/Maui passenger traffic is 44 percent commuter and 56 percent tourist. The Lahaina Small Boat Harbor is located in an attractive commercial setting and an area of heavy pedestrian traffic. There is a positive benefit to the ferry operation provided at this location. There are many support services for the ferry operations, such as restaurants, hotel, retail shops and long-term off-site parking located within close proximity to the ferry pier. The LSBH is also located in proximity to places of employment for the Lana`i and Moloka`i ferry commuters. Interisland ferry pier improvements at LSBH will also support intermodal connectivity and help stimulate commuter ferry rider ship. The County of Maui is planning to initiate a public transportation service for the core commercial area of Lahaina. This service is intended to divert traffic and parking from the Lahaina commercial/retail center to a commuter parking facility east (mauka) of Honoapi`ilani Highway and Lahainaluna Road. In order to keep the ferry cost to commuters and Hawai`i residents at an affordable rate, both ferry operations rely heavily on travel by tourists. The proximity of the Lahaina Small Boat Harbor to the central business district of Lahaina not only makes it an ideal transit site for commuters but also a highly desirable tourist activity. The resultant revenue generated through tourist farebox recovery has provided significant economic benefit for commuter ferry service providers. The sustainability of commuter ferry operations, therefore, is highly dependent on non-commuter farebox recovery from industries such as tourism. Expansion of pier facilities for the interisland ferry at the LSBH would provide long-term economic viability and stability for the two (2) interisland ferry service providers. The LSBH is an established scheduled service terminal, and improvements at this site reduces the risk of starting up services at a new location. The estimated cost of proposed improvements to the LSBH is $8.3 million. See **Appendix "G"**.

6.2.2 Mala Wharf Location Alternative

Mala Wharf is located approximately one (1) mile to the north of the LSBH. Refer to **Figure 15**. Access to the wharf is provided by Mala Wharf Road via Front Street and Honoapi`ilani Highway. See **Figure 18**. The wharf was constructed in 1922 to handle the increasing interisland traffic at the time. It is a deep water docking facility and extends approximately 950 feet from shore. However, design failure to protect the wharf from strong currents and high swells in the area made docking at the facility hazardous. Shortly after it was built, the wharf was declared unsafe and was only used by small craft. The wharf is in serious disrepair and major portions of the wharf are missing or badly damaged beyond repair. The wharf is currently condemned and gated to prevent public entry. Existing facilities at Mala Wharf include a boat launching ramp with a protected breakwater, boat washdown area, unmarked paved parking for approximately 34 vehicles and a comfort station. See **Figure 19**. The existing wharf, which is in a state of deterioration and disrepair, will need to be replaced. The wharf facility is owned by the State of Hawai`i. The Mala Wharf Advisory Committee, representing stakeholders and users of the area, provides input into the management and operation of the onshore facilities. Many small tour boat operators, divers, commercial and recreational fishers use the boat launching ramp.

The following marine observations were provided by the Division of Aquatic Resources, DLNR, based on a marine site inspection of Mala Wharf carried out on July 5, 2005. See **Figure 20**. The eroding wharf provides habitat similar to an artificial reef. The vertical relief, sand areas, and natural coral reefs next to the wharf area provide for the diversity of fishes. Approximately 49 species, representing 17 families were observed. See **Appendix "H"**. Along the northwest part of the reef and between the breakwater and the existing pier structure, coral coverage is up to 80 to 90 percent. The coral coverage beneath the pier was less than 10 percent. *Montipora patula* was established on some of the concrete pilings. The introduced alga *Acanthophora spicifera* was found growing in mates next to the wharf in less



Source: University of Hawaii, Coastal Geology Group

Figure 18

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

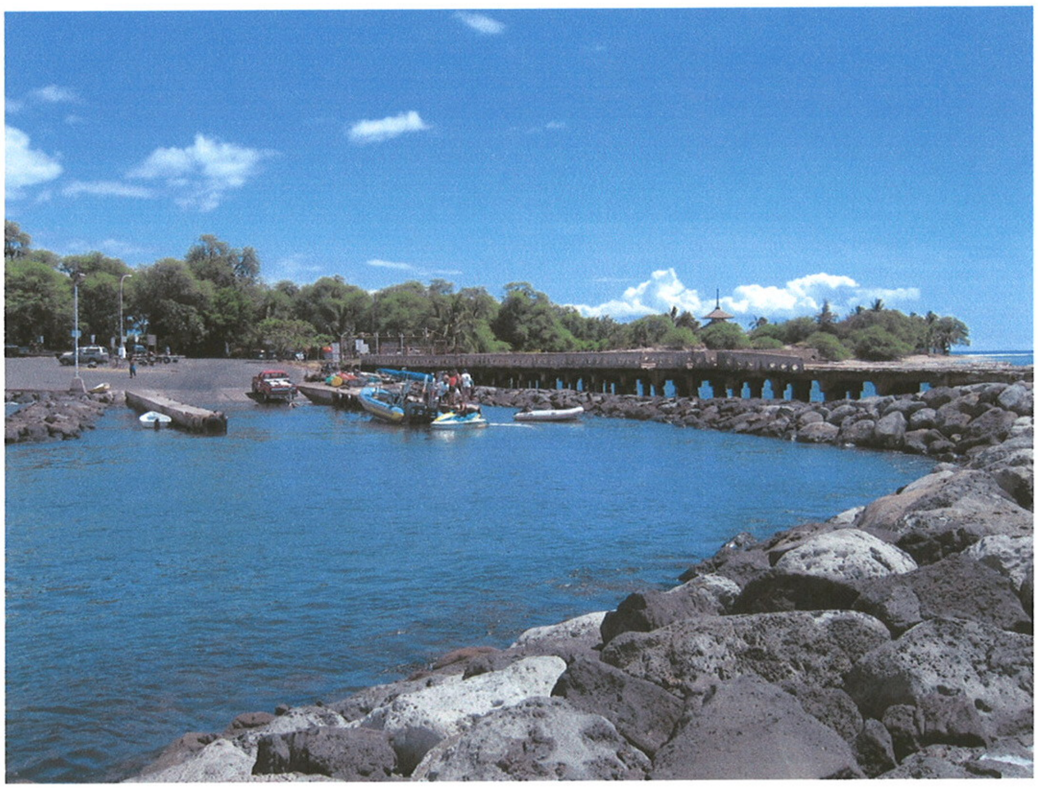
Mala Wharf Site Location Photograph

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

MAI/LhnPier/DEIS/WharfSiteLocation



Source: Dept. Of Land and Natural Resources

Figure 19

Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Mala Wharf Site Alternative

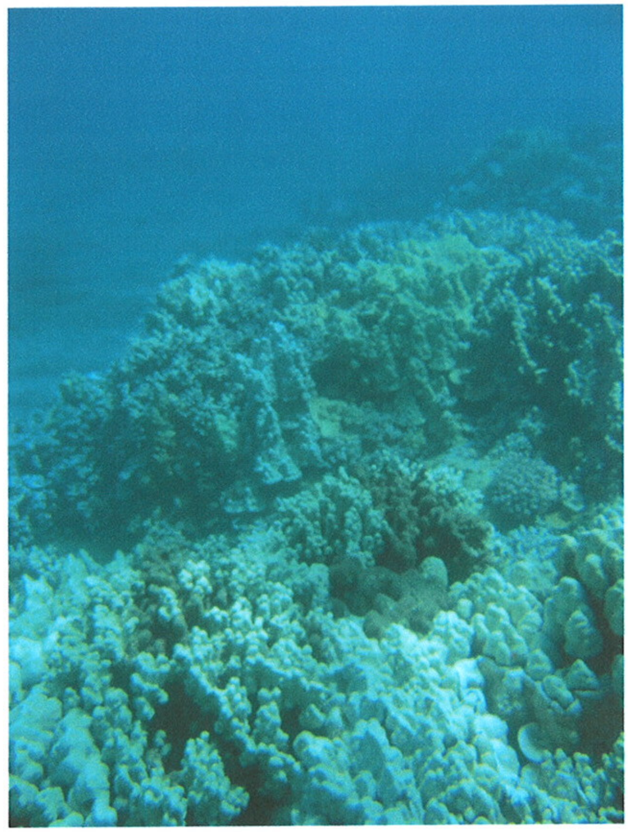
NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

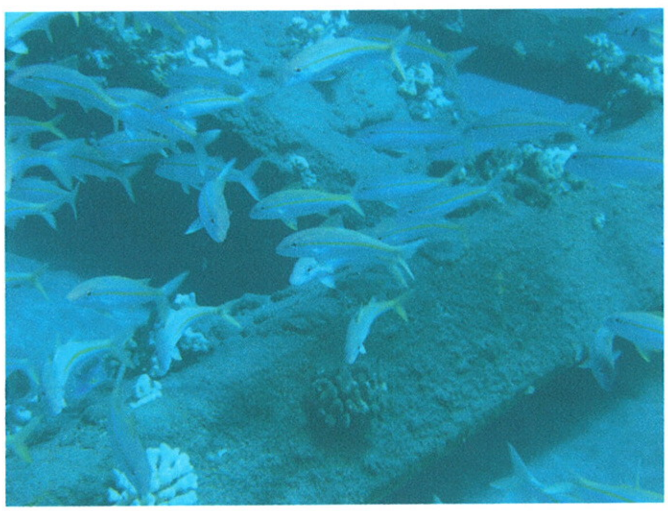
MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/malawharf

Old pieces of the pier function as an artificial reef with coral growth



A healthy natural reef exists in ten feet of water north of the existing pier structure, and directly seaward of the existing breakwater



Substantial fish biomass at Mala Wharf

Source: Division of Aquatic Resources, Dept. Of Land and Natural Resources

Figure 20 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Mala Wharf Marine Biology

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/malamarine

than 3 feet of water. *Carijoa riisei* or snowflake coral was also present in areas over 10 feet, in deeper shaded locations. *Honu* or green turtle (*Chelonia mydas)* up to 3 feet in shell length are common around the reef and in the boat channel.

To make Mala Wharf operational for the interisland ferry service will require the following improvements: (1) demolish the existing wharf; (2) construct a new concrete walkway and pier; (3) construct a ferry terminal building and waiting area for ferry operations and passenger services; (4) construct offsite parking area and repave existing parking area; (5) construct sewer pump out on new concrete pier; (6) construct new individual wastewater system; and (7) extend utility services to the end of the new wharf. The estimated cost for the Mala Wharf improvements is $12.6 million. Refer to **Appendix "G"**.

6.2.2.1 Site Evaluation

Environmental Criteria: Unlike the LSBH, where the reef on either side of the harbor entrance channel provides some protection from wave action, the Mala Wharf area is not protected by reefs on the north side and is more exposed. As a result, wave conditions are more severe at Mala Wharf than LSBH. Therefore, the pier will not be available for use during severe ocean swells and ferry services will be canceled or relocated to Lahaina Small Boat Harbor.

Expansion of the landside ferry support facilities, such as a covered ferry terminal building and upgrading site infrastructure and utilities will impact the area northeast of the existing parking area.

Based on previous archaeological investigation, there is a graveyard in the area containing a number of human burials that are from the prehistoric and historic periods, as well as the location of potential cultural layers including a fishpond. The graveyard is located on a raised beach berm about 115 feet wide and extends parallel to the beach on the north and south side of Mala Wharf. The berm extends to Kahoma Stream to the north and its southern portion has been cut by the Mala Wharf Road. Development of the upland area may be subject to cultural resource limitations as any burials encountered in undertaking landside improvements is likely to result in mitigation and site utilization constraints.

Legislative Criteria: The repairs or replacement of the wharf will involve a Department of Army permit and compliance with the Clean Water Act 404 and Section 401 Water Quality Certification. The Mala Wharf alternative will also involve work within the State Land Use Conservation district. The coastal waters of Lahaina fall within the Office of Conservation and Coastal Land's "resource" subzone. One of the identified land uses in the resource subzone is for marine construction which encompasses dredging, filling and any combination thereof involving submerged lands. Therefore, a Conservation District Use Permit will be required. Three (3) lots upland from Mala Wharf are owned by the State of Hawai`i. The lots are designated Park to the north and Public/Quasi-Public to the south in the West Maui Community Plan. The Maui County zoning for the parcels surrounding Mala Wharf are PK-1, Park and P-1, Public/Quasi-Public, respectively. Although the ferry terminal facilities are permitted in the Public/Quasi-Public district to the north of the Mala Wharf access road, due to known burials and cultural deposits, expansion in this area will need to be processed through a Section 106, Evaluation and Memorandum of Agreement.

Economic Criteria: Due to the poor condition of the Mala Wharf, capital costs to improve the site for the interisland ferry facilities is estimated to be $12.6 million. Equally significant, Mala Wharf is located in an area predominantly surrounded by single-family residential properties, as well as three (3) churches. Land use compatibility conflicts are therefore noteworthy, given the level of ferry passenger volumes anticipated for the new ferry pier. Infrastructure upgrades for parking and roadway systems, for example, are not viewed as being compatible with the surrounding residences. Offsite mitigation measures, for example, to address traffic and noise impacts to surrounding residences will be needed as these issues are anticipated to be raised through the permitting processes noted above. Potential socio-economic impacts associated with this alternative are not considered favorable or beneficial.

Intermodal connectivity at the Mala Wharf location would divert the proposed County public transit service a mile to the north of the main east/west route. The existing ferry service providers may not readily move operations to this alternative site, due to lack of support facilities and passenger amenities, tourist attractions and recreational opportunities. This alternative location does not provide long-term economic viability and stability for the two (2) interisland ferry service providers.

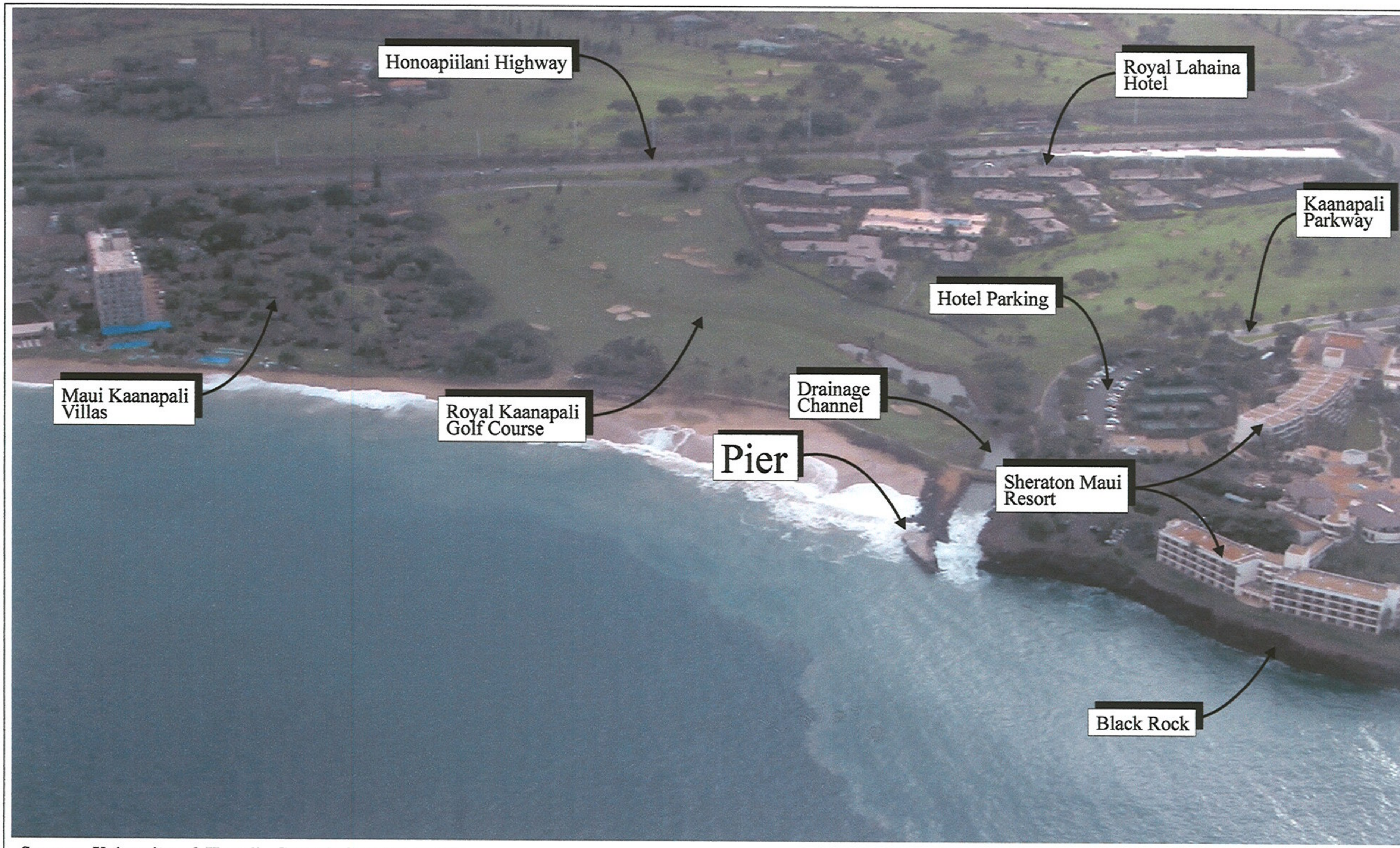
Development of the Mala Wharf for the interisland ferry service does not address the objectives of increased safety at the Lahaina Small Boat Harbor.

The Mala Wharf site alternative was not deemed feasible due to ocean conditions that make the new pier unsafe during severe ocean swells; the high cost of demolishing the existing wharf and construction of a new pier and support facilities; the potential adverse impacts to the marine ecosystem caused by the construction of the new walkway and pier; the potential adverse impacts to the numerous burials in and adjacent to the existing parking lot and known cultural layers caused by the construction of landside support facilities. In addition, the adverse land use compatibility issues and potential to impact the economic viability of the ferry service providers make this site less favorable from an implementation standpoint.

6.2.3 Ke Ka`a Point Location Alternative

Ke Ka`a Point is located at Ka`anapali approximately 4 miles north of Lahaina. Refer to **Figure 15**. It served as the main shipping point for Pioneer Mill's sugar export products and supplies. The pier was constructed at around the turn of the century. It is located next to Black Rock, a prominent historic Hawaiian site. Black Rock was a significant landmark and was used as a place to test the bravery of the *Ali`i* during the prehistoric period. It is a place of stirring classical myths that describe passionate quests and daring feats and encounters with gods. Kahekili, the last chief of Maui, earned the admiration and loyalty of his people by excelling at the sport known as *lele kawa* (leaping feet first from great heights into pools of water) at Black Rock.

Ke Ka`a Point is the present location of the Sheraton Maui Resort. See **Figure 21** and **Figure 22**. Access to Ke Ka`a Point is from the private entrance driveway to the Sheraton Maui Resort off of Ka`anapali Parkway via Honoapi`ilani Highway. There is no direct public vehicular access to Ke Ka`a Point. The pier is privately owned by Ka`anapali Land Co.



Source: University of Hawaii, Coastal Geology Group

Figure 21

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Ke Ka`a Point Location Photograph

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/kekaapointlocation

Source: Dept. Of Land and Natural Resources

Figure 22

Proposed Lahaina Small Boat Harbor
Ferry Pier Improvements
Ke Ka`a Point Site Alternative

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/kekaasitealt

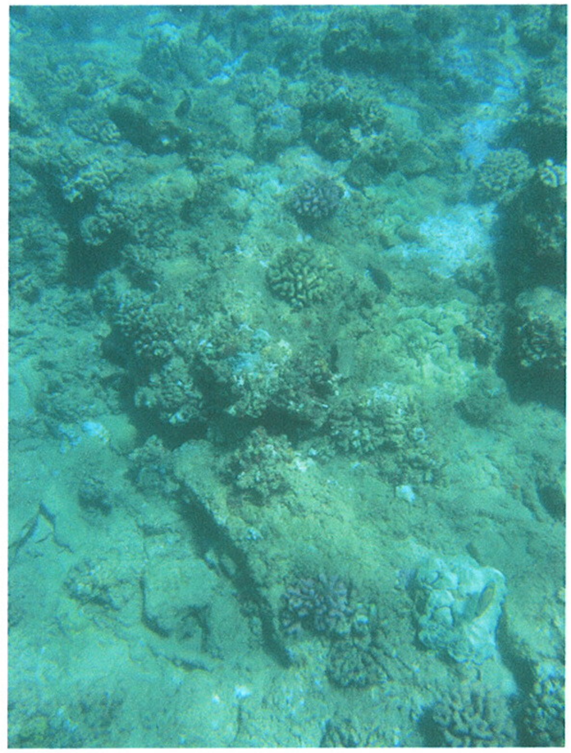
During the early 1900's, tugboats would ferry barges loaded with sugar from the pier out to the ships waiting off-shore. In the 1960's, with the combined pressures of higher labor costs and serious competition in the world sugar market, Pioneer Mill was forced to cease sugar cane cultivation and shipping sugar in West Maui. As a result, the Ke Ka`a Point pier was closed down and the Ka`anapali area was developed as a master planned destination resort area.

The following marine observations were provided by the Division of Aquatic Resources, DLNR, based on a marine site inspection of Ke Ka`a Point carried out on July 5, 2005. See **Figure 23**. The rocky shoreline next to the existing pier quickly drops off. There is a sandy bottom next to the pier. Fresh water flows into the ocean near the pier from the golf course drainage channel. Approximately 31 species of fish, representing 11 families were observed. See Appendix "F-1". Live coral coverage is less than 10 percent near the existing pier. Hard pavement type substrate along the northern edge of the pier had approximately 10 to 15 percent of live coral coverage. Due to the nutrients from the drainage channel, *Pterocladia* (algae) was abundant along the rocky shoreline. *Ulva* and *Halymenia* were also present along the rocky shoreline.

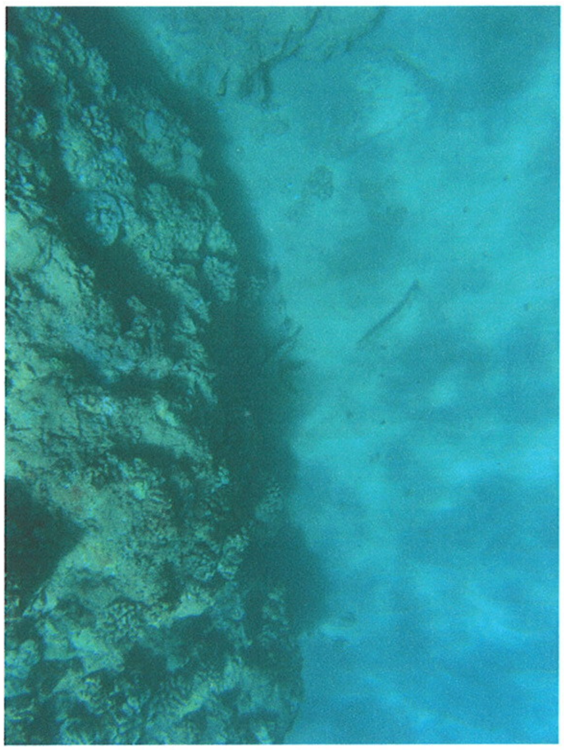
Proposed improvements to make the Ke Ka`a pier operational to accommodate the interisland ferry include securing public access through private lands and extensive repair and modification of the pier. The docking facility will need to be extended into deeper water. This will require driving and or setting of piles on top of the lava rock. The existing pier is not protected by a breakwater or reef on both sides. Ferry operations would be exposed to a greater risk and potentially unsafe conditions due to direct ocean inundation without the construction of a breakwater. Therefore, a breakwater will need to be constructed to protect the docking area from currents and wave action.

To make Ke Ka`a Point operational for the interisland ferry service will require the following improvements: public access from Ka`anapali Parkway; repair and reinforce existing wharf structure; construct a breakwater to protect the wharf and provide safe harbor for the docking facilities; construction of a ferry terminal building and waiting area for ferry operations and passenger services; pedestrian bridge across drainage channel; and construct a new parking structure and comfort station. Total cost for the development of interisland ferry facilities at the Ke Ka`a Point location is estimated to be $18.79 million. Refer to **Appendix "G"**.

Outside edge of pier south view towards the Sheraton Maui Resort



Hard pavement type substrate along the northern edge of the pier. Approximately 5%-10% coral growth



Outside edge of the pier with sand substrate

Northern edge of the pier structure

Source: Division of Aquatic Resources, Dept. Of Land and Natural Resources

Figure 23 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Ke Ka`a Point Marine Biology

NOT TO SCALE

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/kekaamarine

6.2.3.1 Site Evaluation

Environmental Criteria: The ferry pier improvements in the nearshore marine environment will require dredging to secure the toe of the breakwater, construction of the breakwater and repair and maintenance and extension of the pier.

The Black Rock area is a very popular recreational swimming and diving spot. Ferry operations will conflict with the recreational activities carried out in the area. Due to the historical significance of Black Rock, there is a high potential for significant adverse cultural, social and environmental impacts. Mitigation of these impacts may not be readily identified without detailed Section 106, Evaluation and Memorandum of Agreement negotiations.

Legislative Criteria: The proposed work will involve a Department of Army permit and compliance with the Clean Water Act 404 and Section 401 Water Quality Certification. The coastal waters off of Ke Ka`a Point fall within the Office of Conservation and Coastal Land's "resource" subzone. One (1) of the identified land uses in the resource subzone is for marine construction which encompasses dredging, filling and any combination thereof involving submerged lands. Therefore, a Conservation District Use Permit will be required for improvements in the "resource" subzone.

The existing pier is located in the Ka`anapali Resort area. The Sheraton Maui Resort is located immediately to the south; a golf course to the west and white sand beach to the north and open space to the west. The surrounding lands are designated Hotel, PK (Golf Course) and Open Space, respectively in the West Maui Community Plan. The Open Space designation is intended to limit development which may be inappropriate for intensive development due to environmental, physical, or scenic constraints. The Open Space designation of the Ke Ka`a Point site alternative limits development potential due to environmental, physical and scenic constraints.

Economic Constraints: The existing docking area at Ke Ka`a Point is privately owned, therefore, the land and access will have to be purchased by the State. The land acquisition requirements for the ferry terminal facilities will cost approximately $5.0 million. The Ke Ka`a alternative is also located in the midst of the Ka`anapali Resort, a primary visitor destination area for the island. As with the Mala Wharf alternative, land use compatibility issues make this site less desirable. The resort's internal roadway system for example, has been master planned for the existing resort communities. The addition of a new major public facility within the limits of the resort may require new investment in infrastructure upgrades. Additionally, ferry pier compatibility with resort beach operations are not considered favorable.

Total construction and land costs for the required ferry service improvements are estimated to be $18.79 million. Refer to **Exhibit "G"**.

For the above reasons, the FTA and DLNR have determined that construction of a new ferry pier and associated improvements at the Ke Ka`a alternative site would not be economically feasible, environmentally sound or prudent.

6.3 SECTION 4(F) EVALUATION SUMMARY

Each site location alternative had some degree of associated impact on the marine environment. Dredging requirements at the LSBH will primarily be carried out in areas with a sandy bottom. Some coral will be adversely impacted along the vertical channel walls. The Mala Wharf site alternative will also adversely impact coral populations in and around the existing pier columns. The coral cover at the Mala Wharf area of the coastline is approximately 80 to 90 percent. Land use compatibility conflicts, as well as cultural sites and resources adjacent to the Mala Wharf and Ke Ka`a Point sites also constrains landside expansion of necessary support facilities. The LSBH is also located within the boundaries of the Lahaina National Historic Landmark District (NHLD), an area of historical and cultural significance. Preliminary consultations with the State Historic Preservation Division (SHPD) indicate that the project may have an adverse effect on the NHLD. However, the adverse effects may be mitigated through design and construction strategies and archaeological investigations. Furthermore, the existing West Maui Community Plan land use designation of the Ke Ka`a Point site also constrains development of the ferry facilities at this location. The Mala Wharf and Ke Ka`a Point ferry facility and site development costs are also significantly higher than the LSBH alternative, at estimates of $12.6 million, $18.79 million and $8.3 million, respectively.

Based on the above evaluation, FTA and DLNR have determined that the construction of a new ferry pier and associated improvements at the Lahaina Small Boat Harbor is the most environmentally sound and economically prudent site location alternative. In the context of relationship to land use policies and controls, the LSBH conforms most readily to State and County laws and regulations.

6.4 AVOIDANCE ALTERNATIVES

In order to avoid Section 4(f) property, the interisland ferry pier improvements would have to be located outside of the Lahaina National Historic Landmark District and outside of Lahaina Town itself.

Two (2) alternative sites outside the Lahaina National Historic Landmark District were reviewed. These sites included Mala Wharf and Ke Ka`a Point. Based on environmental, legislative and socio-economic criteria, the LSBH was determined to be the most practical alternative. Development of interisland ferry pier improvements at Mala Wharf on Ke Ka`a Point would have significantly greater environmental impacts than at LSBH. Avoidance would not improve the existing conditions and facilities at the LSBH, but develop an entirely new ferry pier while retaining the existing facilities at the LSBH in its state of congestion and unable to safely accommodate existing use. Avoidance in the case of the Ke Ka`a Point site would also require the additional purchase of land by the State of Hawai`i.

6.5 MEASURES TO MINIMIZE HARM

The proposed ferry pier improvements will occur on land and in State waters. The proposed landside improvements will be designed to the extent practicable in consonance with the Architectural Style Book for Lahaina to maintain visual and cultural consistency. Improvements proposed for the harbor area will be carried out in concert with an approved mitigation plan which will result in a net benefit to reef flat marine resources. Best Management Practices (BMPs) will be utilized to minimize impacts from construction-related activities. An Archaeological inventory survey carried out for the project concludes that potential impacts to cultural and historic resources are not anticipated.

6.6 SECTION 4(F) COORDINATION

The proposed LSBH ferry pier improvements are located within the Maui County Historic District No. 1 and Lahaina National Historic Landmark District. The Maui County Cultural Resources Commission (CRC) is charged with review and approval of projects within this district to ensure that the historic character and integrity of Lahaina Town is maintained.

The following coordination was undertaken with the CRC: presentations were made to that body at public meetings in September and November 2004 and in January 2005. Comments were received and design modifications undertaken so that the proposed improvements would not impact the character of the Historic District. Further coordination will be carried out with the CRC during the EIS review process and the Historic District approval process.

Coordination will also continue to be carried out with the Department of Interior, National Parks Service regarding the proposed improvements at LSBH pursuant to Section 106 of the National Historic Preservation Act.

7. CONFORMITY WITH CHAPTER 226 HAWAI`I STATE PLAN; COUNTY GENERAL PLAN AND SHORELINE SETBACK RULES

7. CONFORMITY WITH CHAPTER 226 HAWAI`I STATE PLAN; COUNTY GENERAL PLAN AND SHORELINE SETBACK RULES

7.1 CONFORMITY WITH CHAPTER 226, HAWAI`I STATE PLAN

7.1.1 Affected Environment

Chapter 226, HRS, also known as the Hawai`i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies and priorities, as well as implementation mechanisms.

7.1.2 Environmental Consequences

The proposed alternative improvements to the interisland passenger ferry terminal at the LSBH and related facilities are in consonance with the overall theme, goals and objectives and policies of Chapter 226, HRS, relating to the Hawai`i State Planning Act. The proposed alternative actions are in concert with the following goals of the Hawai`i State Plan:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.

- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

- Physical, social and economic well-being for individuals and families in Hawai`i that nourishes a sense of community responsibility, of caring and of participation in community life.

7.1.2.1 Objectives and Policies of the Hawai`i State Plan

The proposed action is in conformance with the following objectives and policies of the Hawai`i State Plan:

Chapter 226-5, HRS, Objectives and Policies for Population

226-5(b)(3), HRS: Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

Chapter 226-6, HRS, Objective and Policies for the Economy -in General

226-6(a)(1), HRS: Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

226-6(b)(9), HRS: Foster greater cooperation and coordination between government and private sectors in developing Hawaii's employment and economic growth opportunities.

Chapter 226-8, Objective and Policies for the Economy - Visitor Industry

226-8(b)(1), HRS: Support and assist in the promotion of Hawaii's visitor attractions and facilities.

226-8(b)(3), HRS: Improve the quality of existing visitor destination areas.

226-8(b)(4), HRS: Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.

Chapter 226-11, HRS, Objectives and Policies for the Physical Environment - Land-Based, Shoreline, and Marine Resources

226-11(a)(1), HRS: Prudent use of Hawaii's land-based, shoreline, and marine resources.

226-11(a)(2), HRS: Effective protection of Hawaii's unique and fragile environmental resources.

226-11(b)(3), HRS: Take into account the physical attributes of areas when planning and designing activities and facilities.

226-11(b)(8), HRS: Pursue compatible relationships among activities, facilities, and natural resources.

Chapter 226-12, HRS, Objective and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources

226-12(b)(5), HRS: Encourage the design of developments and activities that complement the natural beauty of the islands.

Chapter 226-13, HRS, Objectives and Policies for the Physical Environment - Land, Air, and Water Quality

226-13(b)(2), HRS: Promote the proper management of Hawaii's land and water resources.

226-13(b)(6), HRS: Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.

226-13(b)(7), HRS: Encourage urban developments in close proximity to existing services and facilities.

Chapter 226-14, Objective and Policies for Facility Systems - in General

226-14(b)(1), HRS: Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

Chapter 226-17, Objectives and Policies for Facility Systems - Transportation

226-17(a)(1), HRS: An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.

226-17(b)(4), HRS: Provide for improved accessibility to shipping, docking, and storage facilities.

226-17(b)(6), HRS: Encourage transportation systems that serve to accommodate present and future development needs of communities.

226-17(b)(7), HRS: Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods.

226-17(b)(8), HRS: Increase the capacities of airport and harbor systems and support facilities to effectively accommodate trans-shipment and storage needs.

Chapter 226-23, HRS, Objective and Policies for Socio-Cultural Advancement - Leisure.

226-23(b)(4), HRS: Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.

Chapter 226-26, Objectives and Policies for Socio-Cultural Advancement - Public Safety

226-26(a)(1), HRS: Assurance of public safety and adequate protection of life and property for all people.

7.1.2.2 Priority Guidelines of the Hawai`i State Plan

The proposed alternatives actions are in keeping with the following priority guidelines of the Hawai`i State Plan.

Chapter 226-103, HRS, Economic Priority Guidelines:

226-103(1): Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.

7.1.2.2.1 Encourage investments which:

(i) Reflect long term commitments to the State;

(ii) Rely on economic linkages within the local economy;

(iii) Diversify the economy;

(iv) Reinvest in the local economy; and

(v) Are sensitive to community needs and priorities.

Chapter 226-104, HRS, Population Growth and Land Resources Priority Guidelines

226-104(a)(3), HRS: Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.

226-104(a)(4), HRS: Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.

226-104(b)(12), HRS: Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline conservation lands, and other limited resources for future generations.

226-104(b)(12), HRS: Protect and enhance Hawaii's shoreline, open spaces, and scenic resources.

7.1.2.3 Conformity with State Functional Plans

Comment: The State Functional Plans implement the Hawai`i State Plan by identifying needs, problems and issues, and by recommending policies and priority actions which address the identified areas of concern. The proposed improvement alternatives to the LSBH are consistent with the following State Functional Plans:

7.1.2.3.1 State Recreational Functional Plan

Outdoor recreation is recognized by the Hawai`i State Plan as an important part of life for Hawaii's residents and visitors.

The capacity of beach parks and nearshore areas is rapidly being exceeded because of the significant numbers of resident and visitor users. High volume use is taxing the capacity of related support facilities, such as restrooms and vehicular parking. The LSBH is a popular facility for both residents and visitors and provides a point of access for a wide array of ocean recreational opportunities. The proposed alternative improvements to the

LSBH will provide safety improvements and increase convenience for interisland ferry passengers.

7.1.2.3.2 State Transportation Functional Plan

The Hawai`i State Plan addresses the vital role of transportation, particularly in light of the important relationship between transportation facilities and economic development. The State Functional Plan for Transportation calls for a combination of strategies to reduce the congestion of transportation facilities. These include increasing the transportation capacity, expanding and modernizing the transportation infrastructure, addressing decentralization policies, and reduce the demand for travel, managing our existing transportation system effectively, and seeking and implementing new transportation alternatives.

7.2 MAUI COUNTY GENERAL PLAN

7.2.1 Affected Environment

The 1990 update of the Maui County General Plan establishes broad objectives and policies to guide the long-range development of the County. As indicated by the Maui County Charter, the purpose of the General Plan shall be to:

> *... indicate desired population and physical development patterns for each island within the county; shall address the unique problems and needs of each island and region within the county; shall explain the opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns, and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies and implementing actions to be pursued with respect to population density, land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development.*

7.2.2 Environmental Consequences

The proposed alternative actions are in keeping with the following General Plan objectives relating to land use, economic activity and urban design:

Objectives:

- To support an advanced and environmentally sensitive transportation system which will enable people and goods to move safely, efficiently, and economically.

- To improve the quality and availability of public facilities throughout Maui County.

Policies:

- Encourage the development of more efficient water and air transportation systems.

- Support environmentally sensitive development or modernization of major transportation facilities such as new harbors and airports when they are needed by our residents.

- Explore alternative interisland modes of freight transportation and ongoing modernization and improvement of our harbor facilities.

- Encourage the development of public facilities which will be architecturally and ecologically compatible with their surroundings and foster community development.

7.3 SHORELINE SETBACK VARIANCE

7.3.1 Affected Environment

As applicable, a County of Maui shoreline setback approval or variance will be secured for the proposed improvements within the shoreline setback area. An application for such a variance will be undertaken and submitted to the Maui Planning Commission.

An assessment of the County's shoreline setback criteria relative to the alternative project components within the setback area follows:

7.3.1.1 Analysis of Shoreline Setback Criteria

The following components of the project are located within the shoreline setback, as set forth in Chapter 203, Shoreline Rules for the Maui Planning Commission: renovation of the administration office, installation of underground utilities, replacement of the ferry ticket booth and equipment structures to conform with historic character, grading activity and relocation of the parking stalls to Papalekane Street and accessibility improvements to comply with ADA requirements.

Accordingly, the proposed alternative actions have been evaluated with respect to applicable criteria and considerations advanced by the subject rules.

It is noted that Section 12-203-12(4) provides that the following structures or activities are permitted within the shoreline area:

(4) A structure or activity that consists of maintenance, repair, reconstruction, and minor additions or alterations of legal boating maritime, or water sports recreational facilities, which are publically owned, and which result in no interference with natural beach processes, provided that permitted structures may be repaired, but shall not be enlarged within the shoreline area without a variance.

7.3.1.2 Environmental Consequences

The shoreline rules (Section 12-203-15) also provide criteria for approval of a variance action within the shoreline setback, as follows:

(1) To maintain and require access to and along the shoreline or adequately compensate for its loss;

Response: The existing lateral access in the vicinity of the proposed improvements will not be adversely impacted by the proposed alternative actions.

(2) To minimize risk of adverse impacts on beach processes;

Response: The proposed improvements will not adversely impact beach processes as the improvements will be made on the existing harbor pier and harbor surfaces.

(3) To minimize risk of structures falling and becoming loose rocks or rubble on public property;

Response: The proposed improvements are proposed to increase public safety at the LSBH.

(4) To minimize adverse impacts on public views to, from and along the shoreline.

Response: The new administration office and ticket booth have been designed to minimize height in order to maintain public views to, from and along the shoreline. The landside improvements are common elements to the development alternatives. Alternative 1, with the two-story building, will have greater impacts on public view to and from the shoreline than Alternative 2 and Alternative 3, both of which have lower profile open shade structures.

8. CONFORMITY WITH COASTAL ZONE MANAGEMENT AND SPECIAL MANAGEMENT AREA OBJECTIVES, POLICIES AND GUIDELINES AND CLEAN WATER ACT SECTION 404

8. CONFORMITY WITH COASTAL ZONE MANAGEMENT AND SPECIAL MANAGEMENT AREA OBJECTIVES, POLICIES AND GUIDELINES AND CLEAN WATER ACT SECTION 404

8.1 CONFORMITY WITH COASTAL ZONE MANAGEMENT AND SPECIAL MANAGEMENT AREA OBJECTIVES, POLICIES AND GUIDELINES

8.1.1 Affected Environment

The landside portion of the project area is located within the County of Maui's Special Management Area (SMA). Pursuant to Chapter 205A, HRS, and the Rules and Regulations of the Maui Planning Commission, actions proposed within the SMA are evaluated with respect to Hawai`i Coastal Zone Management Program (HCZMP) and SMA objectives, policies and guidelines. This section addresses the project alternatives relationship to applicable coastal zone management considerations, as set forth in Chapter 205A, HRS and the Rules and Regulations of the Maui Planning Commission.

8.1.2 Environmental Consequences

An application for an SMA Use Permit will be prepared and submitted to the Maui Planning Commission for review and approval.

8.1.2.1 Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreational planning and management; and

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

   (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

   (ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;

   (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

   (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

   (v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

   (vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

   (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

   (viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed project is expected to improve existing harbor operations and services for recreational and commercial boaters, as well as facilitate surfer access to nearby surf breaks.

8.1.2.2 Historical/Cultural Resources

Objective: Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

a. Identify and analyze significant archeological resources;

b. Maximize information retention through preservation of remains and artifacts or salvage operations; and

c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: The project area is located within the Lahaina National Historic Landmark District and falls within the zoning limits of Lahaina Historic District No. 1. Historic and cultural sites in the vicinity of the proposed project include the Hauola Stone, the Brick Palace, the Pioneer Inn, the Lahaina Courthouse, and the Banyan Tree. An Archaeological Inventory Survey report was prepared in May, 2006, by Pacific Legacy, Inc. Refer to **Appendix "B"**. No impacts to historic or cultural resources are anticipated to result from the proposed project alternatives. Should human remains be inadvertently discovered during land-based, ground-altering activities, work will promptly cease in the immediate area of the find, and the find will be protected from further damage. The State Historic Preservation Division will be immediately notified and procedures for the treatment of inadvertently discovered human remains will be followed pursuant to Chapter 6E, HRS.

8.1.2.3 Scenic and Open Space Resources

Objectives: Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

a. Identify valued scenic resources in the coastal zone management area

b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: All proposed structures will be designed in accordance with Lahaina historic district design standards to ensure visual compatibility with surrounding land uses.

8.1.2.4 Coastal Ecosystem

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

b. Improve the technical basis for natural resource management;

c. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: A marine assessment report was prepared for the project by AECOS, Inc and USFWS. Refer to **Appendix "D"** and **Appendix "E"**, respectively. With the proposed mitigation measures, no substantial, adverse impacts to coastal ecosystems are anticipated to result from the proposed action.

Appropriate Best Management Practices and erosion control measures will be implemented to minimize the effects of stormwater runoff during implementation of the project and to ensure that coastal ecosystems are not adversely impacted by construction activities.

8.1.2.5 Economic Use

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

a. Concentrate coastal dependent development in appropriate areas;

b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

   (i) Use of presently designated locations is not feasible;

   (ii) Adverse environmental effects are minimized; and

   (iii) The development is important to the State's economy.

Response: The proposed project is consistent with the goals of the West Maui Community Plan, which guides growth and development in the region. Moreover, as a coastal-dependent facility, the proposed improvements to the LSBH are consistent with the objective and policies for economic use.

8.1.2.6 Coastal Hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

Policies:

a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

d. Prevent coastal flooding from inland projects.

Response: The proposed ferry pier improvement alternatives lie within Zone V12, areas of 100-year coastal flooding with velocity. See **Figure 24**. The proposed improvements will be constructed in accordance with County requirements for developments within flood hazard areas. In addition, the proposed improvements will be designed in accordance with the Drainage Standards of the County of Maui, as applicable, to ensure that the project will not adversely affect downstream and adjoining properties from the effects of flooding and erosion.

8.1.2.7 Managing Development

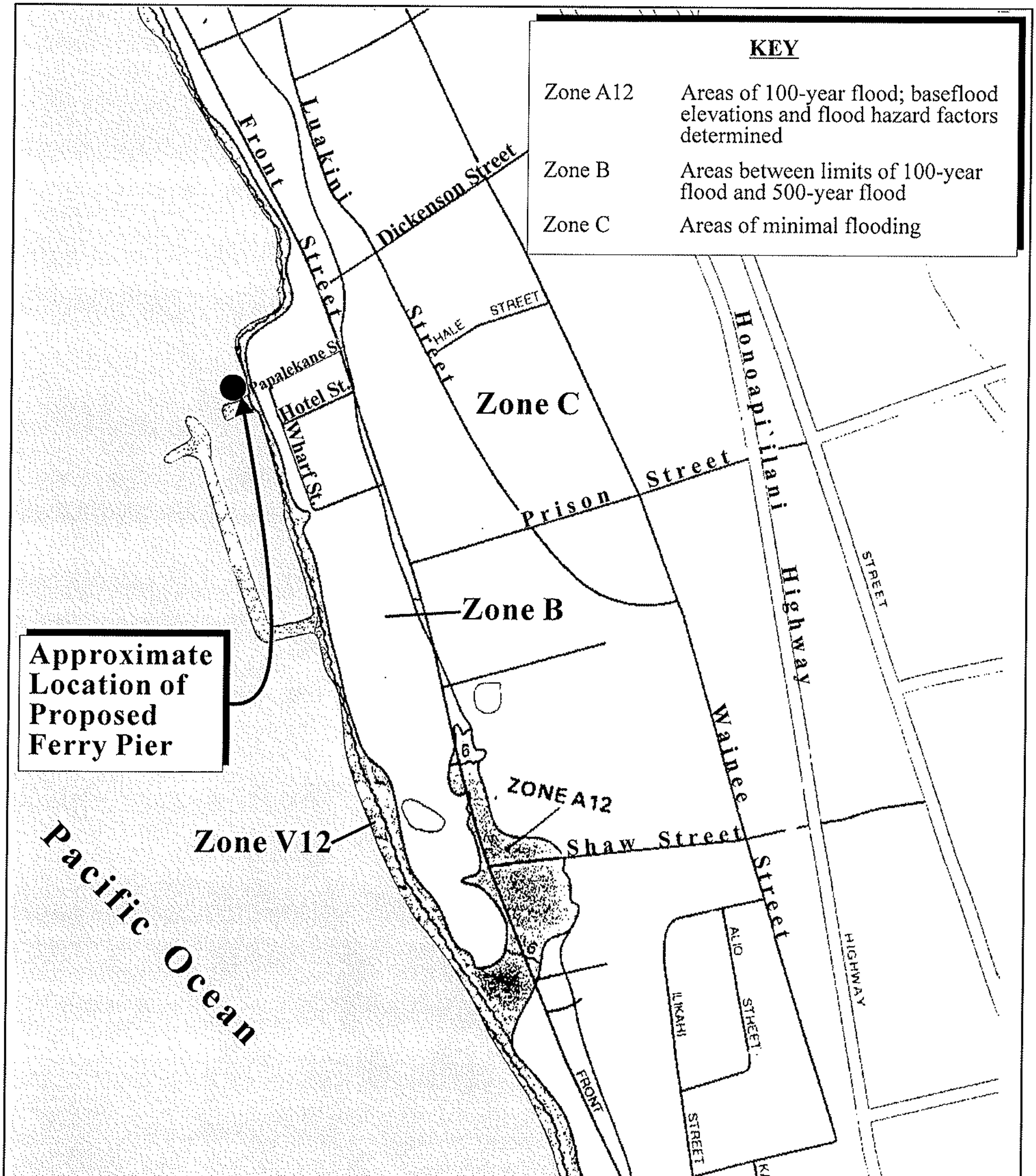
Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

b. Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and

c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.



Source: Flood Insurance Rate Map 150003/0163C

Figure 24 Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Flood Zone Designations

Prepared for: State of Hawaii, Dept. Of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

Mai/lhnpier/deis/floodzne

Response: Opportunities for public participation were provided via a stakeholders' meeting in April 2004 which was held to discuss the alternative conceptual plans for the proposed project (see Chapter X of this document) as well as a public, scoping meeting held in December, 2004 (see Chapter X of this document). Additional public input will be solicited in coordination with the processing of the Draft EIS. All aspects of development will be conducted in accordance with applicable Federal, State and County standards. Opportunities for review of the proposed action are also offered through the regulatory review processes for construction and development permits.

8.1.2.8 Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

a. Promote public involvement in coastal zone management processes;

b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: Development at the LSBH is subject to County of Maui Special Management Area (SMA), Historic District Approval, and Shoreline Setback Variance Proceedings. Opportunities for public awareness, education, and participation in coastal management are provided through these entitlement processes, as well as through Federal and State environmental review processes. As noted above, public input is being received as part of the project planning process.

8.1.2.9 Beach Protection

Objective: Protect beaches for public use and recreation.

Policies:

a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

b. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: The coastal/ocean engineering and AECOS marine assessment report and USFWS Section 404 site assessment and mitigation analysis prepared for the project evaluated potential impacts and recommended mitigation measures. Refer to **Appendix "C"**, **Appendix "D"**, and **Appendix "E"**, respectively. No substantial, adverse impacts to beaches are anticipated to result from the proposed project alternatives.

8.1.2.10 Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: As discussed above, the coastal/ocean engineering and marine assessment reports prepared for the project evaluated potential impacts resulting from the proposed action. Any substantial, adverse impacts to marine or coastal resources will be mitigated through a habitat loss mitigation plan. In addition, Best Management Practices will be implemented during construction to support the policies of effective management of marine resources.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Act 224 (2005) provides that:

> No special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:
>
> (1) Directly illuminates the shoreline and ocean waters; or
>
> (2) Is directed to travel across property boundaries toward the shoreline and ocean waters.

In addressing light pollution issues, the proposed project lighting plan design details for all project alternatives call for all lights to be shielded and directional down lighting within the project to mitigate light pollution and to prevent lighting to travel across property boundaries toward the shoreline and ocean.

8.2 CONFORMITY WITH CLEAN WATER ACT SECTION 404

The Clean Water Act [40 CFR Part 230 Section 404] was enacted to restore and maintain the chemical, physical, and biological integrity of the Nation's water. Section 404 of the Clean Water Act regulates the discharge of dredge and fill materials into the waters of the United States and establishes a permit process to ensure that such actions comply with environmental criteria used by the Corps of Engineers in evaluating all Section 404 permit applications.

The Section 404(b)(1) Guidelines direct the Corps of Engineers to permit the least damaging practicable alternative. Generally, this is the practicable alternative that either avoids waters of the U.S. or impacts the smallest areas. Minimization of impacts may occur where avoidance is not practical after due consideration of costs, existing technology, or logistics.

The alternatives evaluated to meet the stated project purpose and needs included an assessment of non-structural alternatives, a "no action" alternative, and three (3) development alternatives. Alternative 3, a pile supported pier, was deemed to be the "least environmentally damaging practicable alternative".

The proposed concrete piles within the harbor will trigger the Department of Army permitting requirements as a result of the placement of fill within the navigable waters of the U.S. pursuant to Section 404 of the Clean Water Act. Therefore, coordination will be undertaken with the staff of the Corps of Engineers to prepare and process a Section 404 permit application. The Section 404 permit application will conform to the Section 404(b)(1) Guidelines.

Application of a U.S. Department of Army permit will also trigger a Section 401 Water Quality Certification application permit from the State Department of Health and a Coastal Zone Management Consistency Assessment application permit from the Office of Planning, State Department of Business, Economic Development and Tourism. Therefore, coordination with respective departmental staff will be carried out to prepare and process these applications.

Early coordination with Federal and State agencies, in this regard namely Department of Army and State Department of Health, has been carried out pursuant to the Memorandum of Understanding, National Environmental Policy Act and the Clean Water Act, Section 404, Integration Process for Surface Transportation Projects in the State of Hawai`i pertaining to waters of the U.S. and sensitive species. The objective with the coordination is to seek concurrence from the agencies on the site and project alternatives and evaluation and selection of the least environmentally damaging practical alternative during preparation of the EIS document.

9. FINDINGS AND CONCLUSIONS

9. FINDINGS AND CONCLUSIONS

Every phase of the proposed action, expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action have been evaluated in accordance with the Significance Criteria of Title 11, Section 11-200-12 of the Department of Health, Hawai`i Administrative Rules, Environmental Impact Statement Rules. Discussion of project conformance to the criteria is noted as follows:

9.1.1 Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

Marine surveys and assessments by AECOS and USFWS, as well as an archaeological inventory survey and cultural impact assessment, were carried out to address any potential loss or destruction of terrestrial, marine, natural and cultural resources resulting from the proposed project. Loss of marine habitats caused by dredging will be offset and compensated through a project mitigation plan. No archaeological or cultural deposits were uncovered or suspected in the project area. The historical resources in the project vicinity are not anticipated to be adversely impacted by the proposed action.

9.1.2 Curtails the range of beneficial uses of the environment.

The proposed project will not curtail the range of beneficial uses of the environment. Potential impacts to both land-based and marine resources and mitigation measures for them have been analyzed in this document. Water quality will not experience any substantial, adverse impacts. The new ferry pier will extend the public's ability to enjoy the harbor by relieving overcrowded conditions.

9.1.3 Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The State Environmental Policy and Guidelines are set forth in Chapter 344, HRS. The proposed action is in consonance with the following policies and guidelines:

Policy:

(1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawai`i.

Guidelines:

(6) Transportation

(A) Encourage transportation systems in harmony with the lifestyle of the people and environment of the State.

9.1.4 Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.

The proposed project will directly benefit the local economy by providing construction and construction-related employment. In the long term, the proposed project will support the local economy through the contribution of salaries, wages, benefits and taxes, as well as through the purchases of goods and services through individuals and businesses using the ferry pier. The proposed project is anticipated to have a beneficial effect upon the economy by improving harbor operations and service and facilitating interisland connectivity.

9.1.5 Substantially affects public health.

No adverse impacts to public health or welfare are anticipated to result from the proposed project. The action will increase the usability of the LSBH and increase public safety by reducing harbor congestion.

9.1.6 Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed project is not a source of new population to the region. In this regard, the proposed project is not anticipated to adversely affect public services in the region, such as schools, police, and fire protection.

9.1.7 Involves a substantial degradation of environmental quality.

Construction-related activities will create short-term nuisances related to dust and noise. Appropriate dust control and noise mitigation measures will be implemented during these activities to minimize these nuisances. Dredged material will be disposed of on land and will not impact marine water quality. A HEA (Habitat Equivalency Analysis) has been carried out to identify impacts to marine resources and to establish appropriate mitigation.

9.1.8 Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

There are no additional development components associated with the project. Accordingly, the impacts assessed in this EIS document are based on the entire action. The proposed project will not result in a cumulative impact that will result in considerable effects upon the environment.

9.1.9 Substantially affects a rare, threatened, or endangered species, or its habitat.

Two independent marine biological assessments prepared by AECOS and USFWS were conducted in conjunction with the preparation of this EIS. The findings of these studies did not reveal any adverse impact to rare, threatened, or endangered species or habitats by the proposed action. Appropriate mitigation has been identified to offset loss of marine resource habitat.

9.1.10 Detrimentally affects air or water quality or ambient noise levels.

Construction activities will result in short-term air quality and noise impacts. Dust control measures, such as regular watering and sprinkling, and installation of dust screens will be implemented to minimize wind-blown emissions. Noise impacts will occur primarily from construction equipment. Equipment mufflers or other noise attenuating equipment, as well as proper equipment and vehicle maintenance, will be used during construction activities.

In the long term, the proposed project is not anticipated to have a significant impact on air quality, water quality, or ambient noise conditions.

9.1.11 Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The project site is located within Flood Zone V12, areas of 100-year coastal flooding with velocity (wave action). The proposed project will be developed in accordance with Special Flood Hazard Area requirements. The proposed action will occur within coastal waters; a water quality monitoring plan will be prepared for the project to ensure no substantial, adverse impacts to water quality.

9.1.12 Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

The ferry pier will be similar to the existing harbor pier and renovation of the new administration office, low-rise, open-sided structure and ferry ticket booth will be in accordance with historic district design standards. The proposed improvements will be of relatively low-profile and will present minimal impacts to existing views of the ocean.

9.1.13 Requires substantial energy consumption.

The subject project will involve the commitment of funds, fuel for construction equipment, vehicles, and machinery during construction and maintenance activities.

This environmental impact statement has been prepared to disclose relevant environmental and related issues and concerns. Coordination and formulation of appropriate mitigation measures have been undertaken to ensure that impacts associated with the proposed action will be minimized or fully mitigated.

10. EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

10. EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

10.1 ENVIRONMENTAL JUSTICE

Executive Order 12898, dated February 11, 1994, requires federal agencies, and requests other independent agencies, to address the potential for disproportionately high and adverse environmental effects of their actions on minority and low-income populations. Agencies are required to ensure that their programs and activities that affect human health or the environment do not directly or indirectly use criteria, methods, or practices that discriminate on the basis of race, color, or national origin.

The process used by the FTA and DLNR in their environmental documentation does not discriminate against low-income or minority populations in Hawai`i. The proposed action does not discriminate against these populations directly or inadvertently. This EIS document assesses the human health, economic, social, and environmental effects of the various alternatives. A number of public informational meetings were held to obtain public input. These meetings were held in the evening and were well attended by local residents, native Hawaiian organizations and fishers. The proposed improvements will benefit the County residents who rely on the ferry service to commute between the islands for employment opportunities and access to government and health services. Many of the residents, who use the interisland ferry service, are made up of minority and low-income populations. The island of Moloka`i has high unemployment and relatively few new job opportunities. The seasonally adjusted unemployment rate for the island of Moloka`i was 5.2 percent in February 2007 compared with 2.3 for the State. In the Maui County General Plan 2030 Socio-Economic Forecast it is noted that Molokai's age structure has changed during the 1990's with younger people forming a smaller share of the population. Also, in recent years, the unemployment rates declined as older workers who could not find jobs left the job market and not because new jobs were being created (Maui County Planning Department, June 2006). The residents of Lana`i and Moloka`i would benefit from the proposed improvements to the interisland ferry facilities at LSBH and have access to jobs and government services.

11. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND UNRESOLVED ISSUES

11. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND UNRESOLVED ISSUES

11.1 SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed development will result in unavoidable construction-related impacts as described in Chapters II, III, IV and V of this EIS document.

Potential effects include noise-generated impacts occurring from site preparation and construction activities. In addition, temporary air quality impacts associated with dust generated from construction activities, and exhaust discharged by construction equipment. The dredging of the entrance channel and berthing area on the north side of the new pier will remove approximately 2,720 s.f. of reef flat and 17,040 s.f. of sand habitat. However, this loss will be mitigated and offset by the pile supported pier design which is anticipated to result in a net gain of 60,309 s.f. years of piling habitat and removal of the grounded sailboat and recolonization of the coral which is anticipated to result in a gain of 15,742 s.f. years of reef flat habitat. Recently dredged sand habitat is thought to be repopulated on a relatively short time span, in general, within six (6) months to one (1) year. No additional compensatory mitigation was recommended to offset loss of sand habitat.

11.2 UNRESOLVED ISSUES

11.2.1 Section 106 Memorandum of Agreement

Consultation has been undertaken with the State Historic Preservation Office, National Parks Service and native Hawaiian and cultural groups pursuant to Section 106 of the National Historic Preservation Act. However, a Memorandum of Agreement (MOA) has not been entered into with the affected parties to resolve potential adverse impacts to cultural and historic properties.

Coordination will continue to complete the MOA and Section 106 process.

11.2.2 Compensatory Mitigation Plan

The USFWS Fish and Wildlife Coordination Action report recommended that steps 4 to 6 of the structured process be detailed in a written Compensatory Mitigation Plan. The Compensatory Mitigation Plan will need to include the following components: (a) (Step 4) monitoring the compensatory mitigation; (b) (Step 5) establishment of performance standards; and (c) (Step 6) assessment of the effectiveness of the implemented compensatory mitigation with long-term monitoring.

12. PUBLIC COMMENT AND AGENCY COORDINATION

12. PUBLIC COMMENT AND AGENCY COORDINATION

12.1 SCOPING COMMENTS AND RESULTS

12.1.1 Stakeholders Meeting of April 12, 2004

Prior to the preparation of the EIS Preparation Notice (EISPN) for the proposed project, a stakeholders' meeting was held to present the project's initial conceptual plans and obtain early public input for the preparation of the EISPN. Invitations to the stakeholders meeting were sent to elected government officials and government agencies, as well as to parties which could be affected by the proposed action, such as harbor users, businesses, government facilities (school, library), and community groups in the area. See **Appendix "I"**.

The meeting was held on April 12, 2004 at the Lahaina Intermediate School Cafeteria with approximately 25 persons in attendance. Representatives of the State Department of Land and Natural Resources, along with project consultants, handled the presentation, responded to questions, and received comments on the project's preliminary conceptual plans.

A summary of comments received at this meeting follows.

1. The Hauola Stone is very sacred and the area around it is Kapu.
2. Potential impacts to historic sites need to be examined.
3. To provide for greater use and convenience, the new comfort station should be located in the area around the existing pier.
4. The effects of storm surf and ocean currents upon the proposed pier improvements need to be evaluated.
5. The effects of any new dredging on wave action, ocean currents, marine life, and nearby surf spots need to be examined.

6. The proposed pier improvements may increase cruise ship activity which may increase congestion and affect traffic and parking in the area.

7. The two-story ferry building will impact existing views.

8. The area around Mala Wharf should be considered as an alternate site.

9. The proposed pier improvements will add to further ship congestion in the harbor.

10. Due to existing conditions and deferred maintenance, improvements to the existing harbor should be considered first.

12.1.2 Public Scoping Meeting of December 8, 2004

Subsequent to the stakeholder's meeting and consequent revisions to the proposed project, a public scoping meeting was held. This meeting presented the project, discussed how it had evolved from its earlier versions due to public input, and sought further public input. Invitations were again sent to harbor users, businesses, area community groups, as well as governmental officials.

The meeting was on December 8, 2004, at the Lahainaluna Intermediate School Cafeteria. See **Appendix "J"**. A summary of comments received which pertain to the present project follows:

1. The State should consider adding new sewer pump out facilities to the LSBH.

2. There are not enough parking spaces in the harbor vicinity.

3. The project should take high-wave conditions into account.

4. Parking at the loading dock should be reduced from 30 minutes to 15 minutes to relieve traffic congestion at the harbor.

5. Commercial boats should go to their slips rather than use the loading dock.

6. There is insufficient room at the LSBH and surrounding area to service a super-ferry and cruise ships.

7. Increasing the number of piers at the harbor could increase harbor use.

8. Use of the pier by surfers is a cause for concern over safety and liability issues.

9. Other sections of the LSBH also need infrastructure improvement.

10. Potential users of ferry service who live on Lana`i and Moloka`i should be included in the public process.

11. Concern that cruise ships might monopolize the new pier to the exclusion of ferries.

12. Concern that the project might impact the harbor sea-wall.

13. The new pier should also include refueling facilities for the ferries.

14. The LSBH and the ferry operators who use it need infrastructure improvements.

15. Ferry service needs to accommodate locals, rather than tourists.

16. Alternative sites for ferry service need to be considered.

17. Native Hawaiian traditional and customary rights need to be considered.

18. Fuel delivery needs to be improved.

19. Traffic control measures need to be considered.

20. Concern over environmental impacts from Lahaina's development.

21. The electrical box on the existing pier is exposed and is a safety hazard.

12.2 MEMORANDUM OF UNDERSTANDING, NATIONAL ENVIRONMENTAL POLICY ACT AND CLEAN WATER ACT SECTION 404 INTEGRATION PROCESS FOR SURFACE TRANSPORTATION PROJECTS IN THE STATE OF HAWAI`I

Pursuant to the Memorandum of Understanding, National Environmental Policy Act and Clean Water Act Section 404, Integration Process for Surface Transportation Projects in the State of Hawai`i pertaining to water of the U.S. and sensitive species, FTA and DLNR held interagency coordination meetings with the Environmental Protection Agency (EPA), Department of the Interior, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and Department of Army (DA) to participate in the pre-scoping and scoping of the project in preparation of the draft EIS. The objective of the pre-scoping and scoping phase of the project was to develop agency concurrence on the overall project purpose, criteria for alternative selection, project alternatives to be evaluated and to determine the level of agency participation in the preparation of the draft EIS.

13. PARTIES CONSULTED DURING PREPARATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, COMMENTS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

13. PARTIES CONSULTED DURING PREPARATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, COMMENTS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

An Environmental Impact Statement Preparation Notice (EISPN) was prepared and distributed to agencies, organizations and individuals to facilitate the preparation of the Draft EIS. Consultation with the listed Native Hawaiian organizations will take place during the Draft EIS process in compliance with Section 106 of the National Historic Preservation Act. The following organizations, including Native Hawaiian groups, received copies of the EISPN. These organizations will receive a copy of the Draft EIS, as well.

Responses to substantive comments are included in this section.

1. Ranae Ganske-Cerizo, Acting District Conservationist
   Natural Resources Conservation Service
   U.S. Department of Agriculture
   210 Imi Kala Street, Suite 209
   Wailuku, Hawai`i 96793-2100

2. George Young, P.E.
   Chief, Regulatory Branch
   U.S. Department of the Army
   U.S. Army Engineer District, Hnl.
   Attn: CEPOH-EC-R
   Bldg. 230, Room 201
   Fort Shafter, Hawai`i 96858-5440

3. Robert P. Smith
   Pacific Islands Manager
   U. S. Fish and Wildlife Service
   P.O. Box 50167
   Honolulu, Hawai`i 96813

4. Micah Kane, Chairman
   State of Hawai`i
   Department of Hawaiian Home Lands
   P.O. Box 1879
   Honolulu, Hawai`i 96805

5. Chiyome L. Fukino, M.D., Director
   State of Hawai`i
   Department of Health
   P.O. Box 3378
   Honolulu, Hawai`i 96801

6. Herbert Matsubayashi
   District Environmental Health Program Chief
   State of Hawai`i
   Department of Health
   54 High Street
   Wailuku, Hawai`i 96793

7. Peter T. Young, Director
State of Hawai`i
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawai`i 96809

8. Dean Aoki, Administrator
State of Hawai`i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai`i 96809

9. Charlene Unoki, District Land Agent
State of Hawai`i
Department of Land and Natural Resources - Maui District Land Office
54 South High Street, Room 101
Wailuku, Hawai`i 96793

10. Melissa Kirkendall, Ph.D.
State Historic Preservation Division
Maui District Office
130 Mahalani Street
Wailuku, Hawai`i 96793

11. Nathan Napoka, Chief
State Historic Preservation Division
History and Culture Branch
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawai`i 96707

12. Skippy Hau, Aquatic Biologist
State of Hawai`i
Division of Aquatic Resources
Department of Land and Natural Resources
130 Mahalani Street
Wailuku, Hawai`i 96793

13. Melanie Chinen, Administrator
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawai`i 96707

14. Rodney K. Haraga, Director
State of Hawai`i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai`i 96813
cc: Fred Cajigal, DOT-Maui

15. Environmental Protection Agency
Pacific Islands Contact Office
P.O. Box 50003
Honolulu, Hawai`i 96850

16. Clyde Namu`o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawai`i 96813

17. University of Hawai`i
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawai`i 96822

18. Carl Kaupalolo, Chief
County of Maui
Department of Fire Control
200 Dairy Road
Kahului, Hawai`i 96732

19. Michael W. Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawai`i 96793

20. Cultural Resources Commission
c/o Dawn Duensing
Department of Planning
250 South High Street
Wailuku, Hawai`i 96793

21. Glenn Correa, Director
County of Maui
Department of Parks and Recreation
1580-C Kaahumanu Avenue
Wailuku, Hawai`i 96793

22. Tom Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawai`i 96793

23. Milton Arakawa, Director
County of Maui
Department of Public Works and Environmental Management
200 South High Street
Wailuku, Hawai`i 96793

24. Kyle Ginoza, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawai`i 96793

25. George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

26. Ezekiela "Zeke" Kalua, Executive Director
West Maui Taxpayers Association
181 Lahainaluna Road, Suite "H"
Lahaina, Hawai`i 96761

27. Theo Morrison, Executive Director
Lahaina Town Action Committee
648 Wharf Street, Suite 102
Lahaina, Hawai`i 96761

28. Keoki Freeland, Executive Director
Lahaina Restoration Foundation
120 Dickenson Street
Lahaina, Hawai`i 96761

29. Bobbie Best, Librarian
Lahaina Public Library
680 Wharf Street
Lahaina, Hawai`i 96761

30. Patty Nishiyama, Executive Director
Na Kupuna O Maui
320 Kaeo Place
Lahaina, Hawai`i 96761

31. Akoni Akana, Executive Director
Friends of Moku`ula
505 Front Street
Lahaina, Hawai`i 96761

32. Thelma Shimaoka, Community Resource Coordinator
Office of Hawaiian Affairs
140 Ho`ohana Street, Suite 206
Kahului, Hawai`i 96732

33. Vanessa Medeiros, District Supervisor
Department of Hawaiian Home Lands
Maui District Office
655 Kaumualii Street
Wailuku, Hawai`i 96793

34. Rose Marie Duey, Island Representative
Alu Like, Inc.
Maui Island Center
1977 Kaohu Street
Wailuku, Hawai`i 96793

35. Senator Roz Baker
415 South Beretania Street
Room 228
Honolulu, Hawai`i 96813

36. Representative Kam Tanaka
415 South Beretania Street
Room 319
Honolulu, Hawai`i 96813

37. Councilmember JoAnne Johnson
Maui County Council
200 South High Street
Wailuku, Hawai`i 96793

38. Best Western Pioneer Inn
Jim Lennon, General Manager
658 Wharf Street
Lahaina, Hawai`i 96761

39. King Kamehameha III Elementary School
Lindsay Ball, Principal
611 Front Street
Lahaina, Hawai`i 96761

40. Lahaina Arts Society
Graham Watson, Executive Director
648 Wharf Street, Suite 103
Lahaina, Hawai`i 96761

41. Kim Ball, President
Hi-Tech Surf & Sports
425 Koloa Street
Kahului, Hawai`i 96732

42. Kevin and Pam Baughman
277 Wili Ko Place, Suite 4
Lahaina, Hawai`i 96761

43. Tony Whitehead
801 Olowalu Road
Lahaina, Hawai`i 96761

44. David Jung
Island Marine Activities
Moloka`i Ferry
658 Front Street, Suite 101
Lahaina, Hawai`i 96761

45. Don Couch, Executive Assistant
Office of the Mayor
County of Maui
200 South High Street
Wailuku, Hawai`i 96793

46. Steve Knight
Expeditions
Lahaina/Lana`i Passenger Ferry
658 Front Street, Suite 127
Lahaina, Hawai`i 96761

47. Stuart Kahan
Mala Wharf Fishing and Recreation Association
1028 Wainee Street, E-5
Lahaina, Hawai`i 96761

48. Senator Daniel K. Inouye
U.S. Senate
PJKK Federal Bldg.
300 Ala Moana Blvd. Rm. 7325
Honolulu, Hawai`i 96850

49. Senator Daniel K. Akaka
U.S. Senate
PJKK Federal Bldg.
300 Ala Moana Blvd. Room 3104
Honolulu, Hawai`i 96850

50. Representative Ed Case
U.S. House of Representatives
PJKK Federal Bldg.
300 Ala Moana Blvd. Room 5104
Honolulu, Hawai`i 96850

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 7, 200~~4~~5

Eric Hirano
Chief Engineer, Engineering Division
Hawaii Department of Land and Natural Resources
P.O. Box 373
Honolulu, Hawaii 96809

Subject: Lahaina Small Boat Harbor Ferry Pier Notice of Intent (NOI) to Prepare a Draft Environmental Impact Statement (Draft EIS)

Dear Mr. Hirano:

The Environmental Protection Agency (EPA) has reviewed the Notice of Intent referenced above. Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

The Hawaii Department of Land and Natural Resources is seeking to construct an additional ferry pier next to the existing pier in the Lahaina Small Boat Harbor. The Federal Transit Administration is the lead agency for NEPA. EPA's scoping comments include recommendations concerning impacts to water resources, air quality, cultural and historic properties, and environmental justice communities; and analysis of cumulative and indirect impacts associated with the proposed project.

The Draft EIS should fully describe impacts related to dredging (construction and maintenance), including the depth of dredging operations, the nature and extent of dredging impacts, and length of time required for the proposed dredging. Impacts to water quality, coral reefs, and coastal habitats should also be described along with appropriate mitigation. If it is determined that a Clean Water Act Section 404 Individual Permit is required, only the Least Environmentally Damaging Practicable Alternative (LEDPA) can be permitted pursuant to the 404 (b)(1) Guidelines (40 CFR Part 230).

We appreciate the opportunity to review this Notice of Intent. When the Draft EIS is released for public review, please send (2) copies to the address above (mailcode: CMD-2). If you have any questions, please contact Connell Dunning, the lead reviewer for this project at 415-947-4161 or dunning.connell@epa.gov.

Sincerely,

Connell Dunning for

Lisa B. Hanf, Manager
Federal Activities Office

Enclosure: Detailed Comments

cc: Donna Turchie, Federal Transit Administration
Lolly Silva, Army Corps of Engineers

EPA DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE A DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR LAHAINA SMALL BOAT HARBOR FERRY PIER, JANUARY 7, 2005

Placement of Dredged or Fill Material in Waters of the United States

The Draft Environmental Impact Statment (Draft EIS) should describe how the proposed project is in compliance with dredging and filling restrictions in the Clean Water Act (CWA); the Marine Protection, Research and Sanctuaries Act (MPRSA); and Federal regulations to ensure optimal beneficial reuse of dredged material. If it is determined that an CWA Section 404 Individual Permit is required, we recommend that the Department of Land and Natural Resources (DLNR) and Federal Transit Administration (FTA) initiate interagency review through the National Environmental Policy Act and CWA Section 404 Integration Process for Surface Transportation Projects as outlined in the Memorandum of Understanding (NEPA/404 MOU) dated December 1993. This will best ensure that the thresholds of the CWA Section 404(b)(1) Guidelines are satisfied through this environmental review process. If an individual CWA Section 404 permit will be required, only the Least Environmentally Damaging Practicable Alternative (LEDPA) can be permitted pursuant to the 404 (b)(1) Guidelines (40 CFR Part 230). The Draft EIS should also provide enough information to demonstrate that adverse impacts to resources have been avoided and minimized to the greatest extent feasible and that any unavoidable adverse impacts from the project's construction and operation are adequately mitigated.

The Draft EIS should identify the proposed plan for disposing of dredged material (unconfined aquatic disposal in inland or coastal waters, or at the Environmental Protection Agency (EPA)-designated ocean dredged material disposal site). The Draft EIS should also include the sediment evaluation regarding the suitability of the proposed dredged materials for disposal. Materials proposed for disposal in waters of the United States must satisfy the Factual Determinations of 40 CFR Part 230, specified at 40 CFR Part 230.11, using the Evaluation and Testing measures of Subpart G (40 CFR Parts 230.60 and 230.61), or demonstrating consistency with the testing exclusions of these sections. Testing guidance for assessing the quality of sediments to be discharged to waters of the United States is provided in a joint EPA/Army Corps of Engineers' manual, *Evaluation of Dredged Material Proposed for Discharge in Waters of the United States, the Inland Testing Manual* (EPA-823-98). The Draft EIS should recognize that dredged material proposed for disposal at Federally-approved disposal sites pursuant to the MPRSA must be evaluated using criteria at 40 CFR Parts 220-228. Testing guidance for assessing sediment quality is found in a joint EPA/Army Corps of Engineers' *Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual, the Green Book* (EPA-503/8-91/001). For either sediment evaluation, it is important that the project sediments are characterized adequately in all dimensions, area and depth. Because discharge of uncharacterized sediments is prohibited, the sediment sampling must account for overdredging that occurs with the dredging equipment, typically two feet below project depth. We recommend that the sampling plan be submitted to EPA and the Army Corps of Engineers before sediment samples are taken to ensure that no prohibited discharges occur with this project.

Water Quality

The Draft EIS should address how vessel sewage discharge associated with the new pier will comply with CWA Section 312, which establishes effluent standards for marine sanitation devices. Construction of a new pier at Lahaina Small Boat Harbor provides an opportunity to incorporate additional pumpout and dump stations to provide a means for vessels to transport sewage collected on boats to the local sewage system rather than discharging in the harbor. Although one pumpout facility is already located on the existing pier, it is not accessible to many boats when multiple ships are docked. While the construction of a new pier should alleviate congestion and provide greater access to the existing pumpout facility, the new pier should be constructed with additional pumpout and dump to ensure that pier users do not discharge waste into the harbor.

The Clean Vessel Act of 1992, Subtitle V(F) of Public Law 102-587, established the Clean Vessel Act Grant Program to provide funding to States and Territories for the construction, renovation, operation, and maintenance of pumpout and dump stations and waste reception facilities for recreational boaters and also for educational programs that inform boaters of the importance of proper disposal of their sewage. The Draft EIS should address the feasibility of applying funds from this grant program, and others, in order to address the need for additional pumpout facilities at Lahaina Small Boat Harbor. The regional contacts for this program are Tony Faast with the United States Fish and Wildlife Service (503-231-6128) and Mason Young with the Hawaii Department of Boating and Ocean Recreation (808-587-1967).

The Draft EIS should include estimates of the amount of sewage discharged into the harbor from boats docking at current and proposed facilities and a description of the impacts to the marine ecosystem and species. Additional incentives for boat operators and staff to utilize new and proposed pump-out facilities should be addressed. Existing and proposed educational outreach programs to inform boat operators and harbor staff of the impacts of dumping sewage should be described in the Draft EIS.

Coral Reef and Coastal Habitat Protection

Dredging associated with the proposed project will impact coral reefs in Lahaina Harbor. The purpose of Executive Order (EO) 13089 is to increase protection of U.S. coral reef ecosystems. EO 13089 requires that all Federal agencies whose actions may affect coral reef ecosystems in the United States shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. In addition, these Federal agencies shall, subject to the availability of appropriations, provide for the implementation of measures needed to research, monitor, manage, and restore affected ecosystems, including measures reducing impacts from pollution, sedimentation, and fishing. These measures shall be developed in cooperation with the United States Coral Reef Task Force and fishery management councils and in consultation with affected States, territorial, commonwealth, tribal, and local government agencies, non-governmental organizations, the scientific community, and commercial interests. The Draft EIS should address how construction of the proposed project complies with EO 13089.

The Draft EIS should identify if the project is located within an area designated as essential fish habitat. Coordination with the National Oceanic and Atmospheric Administration should be conducted to identify avoidance or mitigation measures. Federal activities, permits and financial assistance must be consistent with the Hawaii Coastal Zone Management Act (HCZMA). The Draft EIS should identify how the proposed project is consistent with the HCZMA and other coastal requirements.

Air Quality

The Draft EIS should address the feasibility of implementing air quality-related mitigation to reduce equipment and marine-vessel emissions of Diesel Particulate Matter (DPM) and other pollutants from construction and operations, including:

- Using low sulfur diesel and ultra-low sulfur diesel fuel for off-road and marine vessels. If low sulfur fuel is not available, FTA and DLNR should determine if making low sulfur fuel readily available and incorporating the appropriate retrofits would be feasible in reducing diesel emissions of idling ferries and other watercraft at the pier.

- Subsidizing the retrofit of older marine vessels and the construction of passenger ferries with cleaner technology. The Draft EIS should quantify the reduction of diesel emissions that could be reduced with retrofitted vessels and/or with vessels constructed utilizing newer, cleaner technology and discuss the feasibility of such measures.

- Providing infrastructure for alternative power options for ferries and other watercraft to reduce diesel emissions related to idling.

It is important to note that an effective air quality mitigation program constitutes "pollution prevention" as defined by Council for Environmental Quality (CEQ) ("Pollution Prevention and the National Environmental Policy Act," CEQ, January 1993). Any feasible measures to reduce marine vessel emissions should be described in the Draft EIS. If techniques exist, but may not be feasible at Lahaina Small Boat Harbor, an explanation should be included in the Draft EIS.

Cultural and Historic Resources

The Corridor Study should identify the potential for adverse impacts to any cultural and historic resources that may be impacted in the study area. The Draft EIS should describe what steps are underway, or are proposed, to ensure compliance with Section 106 of the National Historic Preservation Act and other cultural resource protection laws. Specifically, the Draft EIS should clearly identify how the design of all alternatives address applicable requirements associated with the Lahaina National Historic Landmark District, the Special Management Area for the island of Maui, and Historic District Number One for Maui County. Context sensitive design measures should be incorporated to all alternatives due to the projects proximity to these and other historic sites and the Lahaina shoreline.

Environmental Justice and Community Involvement

Community involvement activities supporting the project should include opportunities for incorporating public input into the facility area design and location process, especially from any members of the community who will be impacted or relocated by the proposed project. The Draft EIS should identify whether the proposed alternatives may disproportionately and adversely affect low-income or minority populations in the surrounding area and should provide appropriate mitigation measures for any adverse impacts. Executive Order 12898 addresses Environmental Justice in minority and low-income populations, and the CEQ has developed guidance concerning how to address Environmental Justice in the environmental review process (http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf).

Analysis of Indirect and Cumulative Impacts

NEPA requires evaluation of indirect and cumulative effects which are caused by the action (40 CFR Parts 1508.8(b) and 1508.7). "Indirect effects may include growth-inducing effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems." CEQ regulations also state that the Draft EIS should include the "means to mitigate adverse environmental effects." (40 CFR 1502.16(h)). This provision applies to indirect effects as well as direct effects. Induced commercial, industrial, and residential growth can adversely affect water quality, wetlands, and other natural resources.

The Draft EIS should evaluate the increased rates of growth for commercial, industrial, recreational, or residential purposes indirectly caused by the project. Specifically, the Draft EIS should estimate the increased number of travelers associated with the increased capacity provided by the extra pier and relate the increased visitation to cultural, water, socioeconomic, and community impacts. The Draft EIS should include the assumptions and forecasting models used to predict visitation. Appropriate mitigation to minimize impacts should be included.

MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Lisa B. Hanf, Manager
Federal Activities Office
United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements Environmental Impact Statement

Dear Ms. Hanf:

Thank you for your letter of January 7, 2005, providing comments on the Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement for the subject project. On behalf of the proposing agency, State of Hawai`i Department of Land and Natural Resources, we wish to provide the following information in response to your comments.

1. *Response to Comments on Placement of Dredged or Fill Material in Waters of the United States*

It is anticipated that a Clean Water Act Section 404 individual permit will be required for the subject project. The Federal Transit Administration and Department of Land and Natural Resources have initiated interagency review with Federal and State agencies pursuant to the NEPA/404 MOU. The Draft EIS will analyze the proposed action in accordance with the CWA 404 (b)(1) Guidelines (40 CFR Part 230).

The Draft EIS will identify the proposed plan for disposing of dredged material. In this regard, it is anticipated that the dredged material will be land disposed. Coordination will be undertaken with the appropriate State and Federal agencies with respect to the proposed land disposal. Coordination will also be undertaken with EPA and the Department of Army Corps of Engineers to ensure that no prohibited discharges occur with this project.

2. *Response to Comments on Water Quality*

A marine water quality assessment will be carried out and the findings will be incorporated in the Draft EIS. The proposed pier improvements at the Lahaina Small Boat Harbor (LSBH) will include two (2) sewage pump out stations on either side of the new pier. The proposed facilities will be provided under the cost-sharing grant with the Federal Transit Administration's grant for improvements to interisland ferry pier facilities in Hawai`i.

Discharging sewage into the harbor from boats docking at the current facility is strictly prohibited.

3. *Response to Comments on Coral Reef and Coastal Habitat Protection*

The impact the dredging will have on the coral reef in the vicinity of LSBH will be evaluated in the Draft EIS. The assessment will include studies of the marine hydrology and coastal processes, as well as a marine biological inventory report. Findings of the US Fish and Wildlife Service's report pursuant to Section 2(b) of the Fish and Wildlife Coordination Act will also be included in the Draft EIS. Compliance with Executive Order 13089, as well as the Hawai`i Coastal Zone Management Act, will be addressed in the Draft EIS. The Draft EIS will also identify if the project is located within an area designated as essential fish habitat.

4. *Response to Comments on Cultural and Historic Resources*

An Archaeological Inventory Survey and Cultural Impact Assessment will be carried out for the proposed project. Findings from these investigations will be discussed and the full reports will be included in the Draft EIS. Assessment of the proposed action in regards to the SMA objectives, Lahaina National Historic Landmark District and the County of Maui Historic District No. 1, will be discussed in the Draft EIS.

5. *Response to Comments on Environmental Justice and Community Involvement*

A number of public prescoping and informational meetings have been held in the community to discuss the project parameters and receive input into the project from the local community. The content and discussion at these meetings will be included in the Draft EIS. Environmental Justice considerations and assessment will be included in the Draft EIS.

6. ***<u>Response to Comments on Analysis of Indirect and Cumulative Impacts</u>***

Assessment of indirect and cumulative impacts will be addressed in the Draft EIS. Appropriate mitigation to minimize indirect and cumulative impacts will be addressed, as required, in the Draft EIS.

As requested, two (2) copies of the Draft EIS will be forwarded to your office for review and comment. Thank you again for your comments.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\USEPA.res.wpd

United States Department of the Inter

NATIONAL PARK SERVICE
Pacific West Region
1111 Jackson Street, Suite 700
Oakland, California 94607-4807

IN REPLY REFER TO

Hard copy to follow in the mail

H34 (PWRO-PC)

March 18, 2005

Mr. Peter T. Young, State Historic Preservation Officer
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
333 Queen Street, Suite 300
Honolulu, Hawaii 96813

Re: Final Environmental Assessment: Proposed Lahaina Small Boat Harbor Pier and Comfort Station Improvements

Dear Mr. Young:

The Lahaina Historic District was designated a National Historic Landmark (NHL) on October 15, 1966, by the U.S. Secretary of the Interior. The responsibility to provide technical assistance and advice has been delegated by the Secretary to the National Park Service. The integrity of the resource is important in preserving national significance.

Thank you for provide us with a copy of the Final Environmental Assessment: Proposed Lahaina Small Boat Harbor Pier and Comfort Station Improvements. I also appreciated meeting you on my recent trip to Hawaii and the opportunity to comment.

The new comfort station appears to be large but necessary and the negative aspects appear to be mitigated as much as possible. The proposed pier is smaller in area than the existing pier; however, the proposed roof over the entire pier is taller, more massive and obstructs much more of the view of the district from the water and the water from the district. The existing pier only has a small structure and phone booth on the pier and the view across the pier in all directions is relatively unobstructed. If possible, the large roof structure over the entire pier should be redesigned into smaller and lower shelters located only where absolutely necessary. If this is not possible, no permanent or temporary structures should be built on or moved onto the pier to at least retain the open view in all directions below and through the large roof structure.

If you have any questions or if I can be of any further assistance, please contact me at 510-817-1401 or by email at David_W_Look@NPS.GOV

Sincerely,

/s/ David

David W. Look, FAIA, FAPT
Deputy Lead, Cultural Resources Program

cc: Melanie Chinen, Acting Administrator, State Historic Preservation Office

MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

David W. Look, FAIA, FAPT
Deputy Lead, Cultural Resources Program
U. S. Department of Interior
National Parks Service
1111 Jackson Street, Suite 700
Oakland, California 94607-4807

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement

Dear Mr. Look:

Thank you for your letter of January 2005, providing comments on the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, we wish to provide the following information in response to the comments on the proposed improvements to the ferry pier improvements.

The low-rise, open-sided structure over the pier is necessary for the comfort and safety of the ferry passengers and other users of the pier. It will provide shelter from the intense sun and inclement weather. The large roof structure that was originally proposed on the pier has been redesigned in corporationg two (2) smaller roofs connected by lower flat trellises. This redesign will break up the mass of the roof and open view corridors.

Again thank you for your comments. A copy of the Draft Environmental Impact Statement will be forwarded to you for further review and comment.

Very truly yours,

M Hirano

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\NatlParks.res.wpd

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 973-2937 • Fax: (808) 973-2941

January 24, 2005

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High St., Suite 104
Wailuku, HI 96793

RE: Environmental Impact Statement Preparation Notice (EISPN) – Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Please refer to Consultation No. I-PI-04-401-TF

Dear Mr. Hirano:

This letter responds to your notice dated December 20, 2004, regarding Munekiyo & Hiraga's intent to prepare an Environmental Impact Statement for the proposed Lahaina small boat harbor ferry pier improvements. The National Marine Fisheries Service (NOAA Fisheries), Pacific Islands Regional Office, Protected Resources Division is pleased to offer comments on the proposed improvements.

Among other duties, NOAA Fisheries is responsible for implementing the mandates of the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). These statutes require the protection of certain marine species. Enclosed with this letter is a list of the marine species under the jurisdiction of NOAA Fisheries' Pacific Islands Regional Office, which encompasses the Hawaiian Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. This list identifies those species protected by the ESA, MMPA, or both.

Of particular concern with regard to the proposed pier improvements would be the potential for interactions with green turtles, hawksbill turtles, Hawaiian monk seals or humpback whales. These species are known to inhabit the waters off Lahaina and around the small boat harbor. Listed below are a series of protocols that NOAA Fisheries recommends be followed when working in areas where protected species may be present.

1. A survey of the project area should be performed just prior to commencement or resumption of construction activity to ensure that no protected spec(ies) are in the project area. If protected spec(ies) are detected, construction activities should be postponed until the animal(s) voluntarily leave the area.

2. If any listed spec(ies) enters the area during the conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.

3. All on-site project personnel should be apprised of the status of any listed spec(ies) potentially present in the project area and the protections afforded to those species under Federal laws. A brochure explaining the laws and guidelines for listed species in Hawaii, American Samoa, and Guam may be downloaded from http://www.nmfs.noaa.gov/prot_res/MMWatch/hawaii.htm.

4. Any incidental take of marine mammals should be reported immediately to NOAA Fisheries' 24-hour hotline at 1-888-256-9840. Any injuries to sea turtles should be reported immediately to NOAA Fisheries at 1-808-983-5730. Information reported should include the name and phone number of a point of contact, location of the incident, and nature of the take and/or injury.

5. Appropriate best management practices (BMPs) should be implemented as applicable to minimize turbidity, minimize species disturbance, and to avoid the release of pollutants into the water. See the enclosure to this letter for a list of potential BMPs.

6. In Hawaii, dredging and/or blasting should be avoided during the humpback whale season of November through April.

7. Any intake pipes on project-related equipment must be screened or otherwise configured to ensure the prevention of entrainment of protected species.

NOAA Fisheries should also be added to the list of parties to be consulted during the preparation of the draft EIS.

Thank you for working with NOAA Fisheries to protect our nation's living marine resources.

Sincerely,

Sarah Malloy for

Tamra Faris
Assistant Regional Administrator for
Protected Resources

Enclosures: Species List
NOAA Fisheries Best Management Practices

HAWAII MARINE PROTECTED SPECIES

National Marine Fisheries Service, Pacific Islands Regional Office

MARINE MAMMALS

All marine mammals are protected under the Marine Mammal Protection Act. Those in *ITALICIZED CAPITALS* are also listed as endangered under the Endangered Species Act.

Common Name	Scientific Name
HAWAIIAN MONK SEAL	*Monachus schauinslandi*
HUMPBACK WHALE	*Megaptera novaeangliae*
SPERM WHALE	*Physeter macrocephalus*
BLUE WHALE	*Balaenoptera musculus*
FIN WHALE	*Balaenoptera physalus*
Common Dolphin	*Delphinus delphis*
Northern Elephant Seal	*Mirounga angustirostris*
Rough-Toothed Dolphin	*Steno bredanensis*
Risso's Dolphin	*Grampus griseus*
Bottlenose Dolphin	*Tursiops truncatus*
Pantropical Spotted Dolphin	*Stenella attenuata*
Spinner Dolphin	*Stenella longirostris*
Striped Dolphin	*Stenella coeruleoalba*
Melon-Headed Whale	*Peponocephala electra*
Pygmy Killer Whale	*Feresa attenuata*
False Killer Whale	*Pseudorca crassidens*
Killer Whale	*Orcinus orca*
Short-Finned Pilot Whale	*Globicephala macrorhynchus*
Blainville's Beaked Whale	*Mesoplodon densirostris*
Cuvier's Beaked Whale	*Ziphius cavirostris*
Pygmy Sperm Whale	*Kogia breviceps*
Dwarf Sperm Whale	*Kogia sima*
Bryde's Whale	*Balaenoptera edeni*
Fraser's Dolphin	*Lagenodelphis hosei*

SEA TURTLES

All sea turtles are protected under the Endangered Species Act. Those in *italics* are listed as endangered, while those in normal lettering are listed as threatened.

Common Name	Scientific Name
LEATHERBACK TURTLE	*Dermochelys coriacea*
HAWKSBILL TURTLE	*Eretmochelys imbricata*
GREEN TURTLE	*Chelonia mydas*
OLIVE RIDLEY TURTLE	*Lepidochelys olivacea*
LOGGERHEAD TURTLE	*Caretta caretta*

Last updated July 2004

Best Management Practices
National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Pacific Islands Regional Office, Protected Resources Division

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a. Turbidity and siltation from project-related work should be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

b. Any construction-related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at the conclusion of the construction work.

c. All project-related materials and equipment placed in the water should be free of pollutants.

d. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, etc.)

e. No contamination (trash or debris disposal, alien species introductions etc.) of marine (reef flats, lagoons, open ocean, etc.) environments adjacent to the project site should result from project-related activities.

f. Fueling of project-related vehicles and equipment should take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site should be developed. Absorbent pads, containment booms and skimmers will be stored on-site to facilitate the cleanup of petroleum spills.

g. Underlayer fills will be protected from erosion with core-loc units (or stones) as soon after placement as practicable.

h. Attempts must be made to prevent discharge of dredged material into the marine environment during the transporting and off-loading of dredged material.

i. Return flow of or run-off from dredged material stored at inland dewatering or storage sites must be prevented.

j. Avoid drift to waterways and non-target sites.

k. Protect desirable non-target vegetation from overspray. Tarps may be needed in some situations.

Last updated December 23, 2004

MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Chris Yates, Assistant Regional Administrator for Protected Resources
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawai`i 96814

SUBJECT: Environmental Impact Statement Preparation Notice for the Lahaina Small Boat Harbor Ferry Pier Improvements

Dear Mr. Yates:

Thank you for your letter of January 24, 2005, providing comments on the Environmental Impact Statement (EIS) Preparation Notice for the proposed Lahaina Small Boat Harbor (LSBH) Ferry Pier Improvements, in Lahaina, Maui, TMK (2) 4-6-001:002. Our responses have been numbered to correspond with your letter:

1. Construction activities will be scheduled to minimize impacts to protected species. A survey of the project area will be performed to ascertain the presence of protected species. Should such species be present, construction activities will be postponed.

2. As Item No. 2 above.

3. Onsite project personnel will be informed of the status of any listed species present in the project area and of the protections extended to them.

4. Accidental contact with or harm to protected species will be reported to the appropriate authorities.

5. The Department of Land and Natural Resources will implement Best Management Practices (BMPs) to the fullest extent practicable during construction-related activities.

6. There are no blasting activities associated with the proposed project. As discussed in Item No. 1 above, construction activities, including dredging, will be scheduled to minimize impacts to protected species.

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhinconline.com

7. Any intake pipes used in project-related equipment will be appropriately screened or otherwise configured so as to prevent the entrapment of protected species.

Thank you again for providing your input to the proposed action. A copy of the Draft EIS will be provided to you for review and comment.

Very truly yours,

MHirano

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\NOAA.res.wpd

JAN 21 2005

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

January 10, 2005

Regulatory Branch

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Subject: Comments on the Proposed Lahaina Small Boat Harbor Ferry Pier Improvements, Lahaina, Hawaii, File Number POH-2004-1015

Dear Mr. Hirano:

The EISPN (Environmental Impact Statement Preparation Notice) has been reviewed pursuant to Section 10 of the Rivers and Harbors Act (RHA), Section 404 of the Clean Water Act (CWA), and Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) of 1972. The aforementioned project does not appear to involve activities subject to the requirements of Section 103, but will involve placement of fill material into waters of the U.S. under our regulatory jurisdiction pursuant to Section 10 of the RHA and Section 404 of the CWA. Section 404 requires that a Department of the Army permit be obtained prior to the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands (33 U.S.C. 1344). Section 10 of the RHA regulates any work or activity conducted in navigable waterways.

Specific information and plans regarding the scope of the project would be required to make a formal determination of jurisdiction. Ms. Lolly Silva of my staff is available to meet with you and/or the applicants to discuss the scope of the project. Furthermore, we request that a copy of the draft Environmental Impact Statement for the proposed ferry pier project be sent to this office.

Thank you for your cooperation with our regulatory program. To schedule a meeting, please contact Ms. Silva by phone at 808-438-7023, by facsimile at 808-438-4060, or by electronic mail at laurene.silva@usace.army.mil .

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

George Young, Chief
Department of the Army
Regulatory Branch
U. S. Army Engineer District, Honolulu
Ft. Shafter, Hawai`i 96858

SUBJECT: Environmental Impact Statement Preparation Notice for the Lahaina Small Boat Harbor Ferry Pier Improvements

Dear Chief Young:

Thank you for your letter of January 10, 2005, providing comments on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Lahaina Small Boat Harbor Ferry Pier Improvements in Lahaina, Maui, TMK (2) 4-6-001:002. In response to your comments, we note that the proposing agency, State of Hawai`i, Department of Land and Natural Resources, intends ongoing coordination with your office to determine appropriate jurisdiction and permitting for the proposed ferry pier. We also note that a copy of the Draft Environmental Impact Statement will be provided to you for review and comment.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
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LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879
HONOLULU, HAWAII 96805

December 23, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice report for the "Proposed Lahaina Small Boat Harbor Ferry Pier Improvements" project on Maui. The Department of Hawaiian Home Lands has no comments to offer.

Should you have any questions, please call the Planning Office at (808) 586-3836.

Aloha and mahalo,

Darrell Yagodich
for
Micah A. Kane, Chairman
Hawaiian Homes Commission

JAN 20 2005

January 20, 2005

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Re: Environmental Impact Statement Preparation Notice (EISPN)-
Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Comments:

1. Attending the Dec 8, 2004 public hearing for the DLNR Boating Division, the proposed pier should take into account of the ocean currents within the harbor. We would not want sedimentation occurring and become a maintenance problem.

2. The proposed open sided structure should not obstruct existing views, specifically the lighthouse for ships entering the harbor.

3. Within the scope of this project, is it possible to construct a comfort station to handle the existing pier and the proposed pier?

4. The Mala Wharf area should be considered as an alternate site for improvements.

5. Both the existing and proposed pier should be used by the Lanai and Molokai Ferries first priority, then other users should be allowed to utilize these piers, such as other commercial users, boaters, and cruise ship unloading. Space is so valuable within the harbor area, that the piers should be used to the maximum to accommodate the public.

6. Being located in the historic district and Federal funds are appropriated I believe the proposed work would come under Section 106 review process.

Thank you for this opportunity to comment on the EISPN.

George Kaya

George Kaya
Governor's Maui Liaison
2264 Aupuni Street, Suite 1
Wailuku, Hawaii 96793
Phone: 243-5798
Email: George.Kaya@hawaii.gov

MUNEKIYO & HIRAGA, INC.

Michael T. Munekiyo
Gwen Ohashi Hiraga
Mitsuru "Mich" Hirano
Karlynn Kawahara

Mark Alexander Roy

December 14, 2007

George Kaya
Governor's Maui Liaison
2264 Aupuni Street, Suite 1
Wailuku, Hawai`i 96793

SUBJECT: Environmental Impact Statement Preparation Notice for the Lahaina Small Boat Harbor Ferry Pier Improvements

Dear Mr. Kaya:

Thank you for your letter of January 20, 2005, providing comments on the Environmental Impact Statement (EIS) Preparation Notice for the proposed Lahaina Small Boat Harbor (LSBH) Ferry Pier Improvements, in Lahaina, Maui, TMK (2) 4-6-001:002. Our responses have been numbered to correspond with your letter:

1. An Oceanographic Design Criteria and Coastal Engineering Assessment was prepared by EKNA Services, Inc. for the proposed project. This provided useful ocean current data for the design considerations and will be included in the Draft EIS.

2. Potential impacts to view planes for the proposed project will be considered in the Draft EIS. The Department of Land and Natural Resources (DLNR) is very conscious of the need to avoid any impacts to oceanside views of the lighthouse. The roof structure over the proposed pier has been redesigned to incorporate two (2) smaller roofs which are separated by low trellises which will maintain view corridors.

3. The scope of the proposed ferry pier does not include comfort station facilities. However, the DLNR has pursued, on a separate track, improvements to the existing comfort station. This comfort station is intended to service the users of the LSBH. The improvements, which should be implemented before the proposed new ferry pier, include expanding the comfort station from its current six (6) stalls to a total of eighteen (18) stalls, including three (3) ADA-compliant stalls.

4. The Draft EIS will include an Alternative Analysis which discusses site alternatives. Mala Wharf was one of the alternative sites given consideration for the new ferry

pier. A number of factors which are discussed in the Draft EIS led to that location being deemed less desirable and feasible than the LSBH.

5. The DLNR's intent for the new ferry pier is to improve ferry service in the LSBH. Use of the new ferry pier will be prioritized for ferry vessels. However, when the ferry pier is not being used by the ferry vessels it can be used by other vessels.

6. The proposed project is subject to the Section 106 review process. Coordination continues to be undertaken with the State Historic Preservation Division and native organizations for this review.

Thank you again for providing your input to the proposed action. A copy of the Draft EIS will be provided to you for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\kaya.res.wpd

DEC 30 2004

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

December 29, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Mr. Hirano:

Subject: **Lahaina Small Boat Harbor Ferry Pier Improvements**
TMK: (2) 4-6-001: 002

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice. The following comments are offered:

1. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.

2. Although it is not a requirement, it is recommended that the applicant look into the feasibility of installing sewage pumpout facilities for recreational and commercial vessels.

Should you have any questions, please call me at 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: WWB

MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Herbert S. Matsubayashi, Chief
District Environmental Health Program
Maui District Health Office
54 High Street, Suite 104
Wailuku, Hawai`i 96793

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement

Dear Mr. Matsubayashi:

Thank you for your letter of December 29, 2004, providing comments on the Environmental Impact Statement Preparation Notice (EISPN) for the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, we wish to provide the following information in response to your comments.

1. Coordination with the State Department of Health will be carried out in order to meet the requirements set forth in Hawai`i Administrative Rules, Chapter 11-46, Community Noise Control. A noise permit, if required, will be obtained before commencement of work.

2. Two (2) sewage pump-out facilities placed on either side of the pier are proposed as part of the project improvements.

Thank you again for your comments. A copy of the Draft EIS will be forwarded to you for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\DOH.res.wpd

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhinconline.com

JAN 13 2005

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRIAN H. SEKIGUCHI

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

IN REPLY REFER TO:

STP 8.1521

December 29, 2004

Mr. Mich Hirano, AICP
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement Preparation Notice (EISPN)

Thank you for your transmittal requesting our review of the subject project.

We have been working with the Department of Land and Natural Resources to secure federal funding for this project, and are in full support of it.

Very truly yours,

RODNEY K. HARAGA
Director of Transportation

JAN 10 2005

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

January 6, 2005

Mr. Peter Young, Chair
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Young:

Subject: EISPN for the Lahaina Small Boat Harbor Ferry Pier Improvements

Thank you for the opportunity to review the subject document. We have the following comments.

1. Please describe the traffic, parking, and wastewater impacts associated with the additional boats?

2. Please analyze the impacts to surf sites.

3. OEQC recommends that a joint State and Federal EIS be prepared for this project.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Genevieve Salm

Genevieve Salmonson
Director

C: Munekiyo & Hiraga, inc.

MUNEKIYO & HIRAGA, INC.

Michael T. Munekiyo
Gwen Ohashi Hiraga
Mitsuru "Mich" Hirano
Karlynn Kawahara

Mark Alexander Roy

December 14, 2007

Laurence K. Lau, Interim Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai`i 96813

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements Environmental Impact Statement

Dear Mr. Lau:

Thank you for your department's letter of January 6, 2005, providing comments on the Environmental Impact Statement Preparation Notice (EISPN) for the subject project. On behalf of the Proposing Agency, State of Hawai`i, Department of Land and Natural Resources, we wish to provide the following information in response to your comments.

1. A Traffic Impact Assessment Report (TIAR) has been prepared by Wilson Okamoto Corporation for the subject project. The findings and conclusion of the TIAR will be discussed and included in the Draft EIS.

2. An Oceanographic Design Criteria and Coastal Engineering Assessment were prepared by EKNA Services, Inc., for the proposed project. The study assessed wave and current patterns in and around the Lahaina Small Boat Harbor and concluded that the proposed dredging will not adversely impact the existing surf sites. The findings and conclusions of the potential impacts on surf sites will be discussed and included in the Draft EIS.

3. The Environmental Impact Statement will be carried out pursuant to Chapter 343, Hawai`i Revised Statutes and the National Environmental Policy Act of 1969, as recommended.

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhinconline.com

Thank you again for your comments. A copy of the Draft Environmental Impact Statement will be forwarded to your office for processing, review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\oeqc.res.wpd

JAN 0 5 2005

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 3, 2005

Mr. Mich Hirano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Log No: 2004.3654
Doc No: 0412SC25

Dear Mr. Hirano:

SUBJECT: National Historic Preservation Act, Section 106 Compliance – Environmental Impact Statement Preparation Notice (EISPN) for the Proposed Lahaina Small Boat Harbor Ferry Pier Improvements Lahaina, Lahaina, Maui TMK: (2) 4-6-001:002, 014 and 017

Thank you for the opportunity to comment on the EISPN for the proposed improvements to the Lahaina Small Boat Harbor Ferry Pier, received on December 8, 2004. Our review is based on historic maps, aerial photographs, records, and reports maintained at the State Historic Preservation Division (SHPD). In addition, Nathan Napoka (History and Culture Branch), Thomas Lim and Susan Tasaki (Architecture Branch), and Melissa Kirkendall (Archaeology Branch) have all conducted field inspections in connection with the proposed undertaking.

The proposed undertaking includes the construction of a new ferry pier at the Lahaina Small Boat Harbor on Maui. The proposed new pier will be placed to the north of the existing pier in the harbor. Since the proposed new pier is financed in part by the Federal Transit Administration (FTA), the project falls under the purview of the National Historic Preservation Act, Section 106 Compliance.

As you have noted, the proposed undertaking is to be carried out within the Lahaina Historic District National Historic Landmark (NHL) District. Judging from the preliminary plans present in the subject EISPN, one or more contributing properties of NHL District may be adversely affected by the proposed undertaking. These contributing property include architectural and archaeological sites, and traditional cultural properties.

JAN 3 2005

You propose to conduct archaeological and cultural investigations in order to identify all historic properties within the Area of Potential Effect (APE) for the proposed undertaking. The investigations will include a determination of effect, and any proposed mitigation. We understand that the Engineering Division of the Department of Land and Natural Resources has contacted the NHL Program manager, and will be consulting with them on behalf of the FTA. Our office further anticipates that a Memorandum of Agreement (MOA) will need to be developed and executed by the FTA, prior to beginning any construction. The MOA will serve to resolve any "adverse effects" on the significant historic sites known to be in or near the APE.

We look forward to reviewing the archaeological and cultural studies that will be prepared as part of the EIS for the proposed undertaking. If you have any questions about archaeological matters, please contact Dr. Melissa Kirkendall on Maui at 243-5169. If you have questions about architectural matters, please contact Thomas Lim on O`ahu at 692-8030. If you have any questions about burials or cultural matters, please contact Nathan Napoka on O`ahu at 587-0192.

Sincerely,

Melanie A. Chinen,
Deputy State Historic Preservation Officer

SC:slc

C: Carol Braegelmann, Environmental Protection Specialist, Office of Human & Natural Environment, Federal Transit Administration, 400 Seventh Street, SW, Washington, DC 20590
Michael Foley, Director, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Eric Hirano, Administrator, Engineering Division, DLNR
Lee Keatinge, The President's Advisory Council on Historic Preservation
Thomas Lim, Branch Chief, Architecture Branch
Maui Section, Archaeology Branch
Maui Cultural Resources Commission, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Nathan Napoka, Branch Chief, History and Culture Branch
Richard Rice, Administrator, DOBOR, DLNR

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Deputy State Historic Preservation Officer
State Historic Preservation Division
State of Hawai`i
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawai`i 96809

SUBJECT: National Historic Preservation Act, Section 106 Compliance
Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement (EIS)

Dear Sir or Madam:

Thank you for your letter of January 3, 2005 providing comments on the proposed project. An Archaeological Assessment and a Cultural Impact Assessment have been carried out for the proposed project by Pacific Legacy, Inc. The findings and conclusion of the archaeological and cultural assessments will be provided in the Draft EIS. A copy of the reports will also be submitted to your office for review and approval.

The Department of Land and Natural Resources has also been meeting with cultural organizations within the project area to discuss the parameters of the project and lay the ground work for the Memorandum of Agreement to resolve any "adverse effects" on cultural and historic resources.

Thank you again for your comments. A copy of the Draft EIS will be forwarded to your office for review and comment.

Very truly yours,

MHirano

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
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JAN 10 2005

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
130 MAHALANI STREET
WAILUKU, HAWAII 96793
Phone (808) 243-5294

January 4, 2005

To: Mich Hirano, AICP
Munekiyo & Hiraga, Inc.

From: Skippy Hau, Aquatic Biologist

Subject: EISPN Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

(Page 41) The report states that the proposed project will facilitate surfer access to nearby surf spots. What are those accommodations and what happens when vessels are using the Pier? (Page 6 – movable gangway on west end of pier was described.)

Will the fuel dock or fueling operations be restricted to the existing pier? How are fuel spills or accidents addressed? Is there an oil spill plan for the new ferry pier improvements? Will access to the fuel dock be improved?

Will there be electricity, lights, water, or other utilities provided on the ferry pier?

On 16 November 2004, Dave Gulko, our coral reef biologist and I conducted an inspection of a grounded vessel. We also inspected The Carthaginian II and found a sandy bottom surrounding the vessel. On the bottom, we also found a metal walkway and fish trap beneath the vessel. Remnant coral pieces, invertebrates, and algae were found on the vessel hull and mooring lines. If possible, debris should be removed from the surrounding bottom during construction.

Call me if you have any questions.

c: DAR - Oahu

MUNEKIYO HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Skippy Hau, Aquatic Biologist
Division of Aquatic Resources
Department of Land and Natural Resources
130 Mahalani Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements Environmental Impact Statement

Dear Mr. Hau:

Thank you for your letter of January 10, 2005, providing comments on the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, we wish to provide the following information in response to your comments.

1. Surfer access from shore and/or the new ferry pier has been incorporated in the project plans. A small floating dock located on the land side of the new pier will facilitate surfer access. Surfers will be allowed to gain access to the ocean when the ferry pier is being used via the ladder and floating dock. Surfers will, however, need to use caution when paddling to the surfing spots to avoid interfering with ferry and harbor traffic.

2. The fueling operations will remain on the existing pier. There will be no expansion of the fueling station. Fuel spills or accidents are handled by trained harbor staff through application of absorbent pads when it occurs on the pier and by oil booms if the spill occurs in the water. An oil spill plan for the new ferry pier improvements will not be necessary since the new pier will not have fuel dispensers.

3. Access to the fuel dock on the north face of the existing pier will be improved by the proposed improvements. The new pier will reduce congestion at the existing pier, thereby, increasing access to the fuel station.

4. Electricity, lights, water and two (2) sewage pump out stations will be provided on the new ferry pier.

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305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

5. The area beneath the former Carthaginian II moorage site will be dredged. The dredged material, including the debris, will be removed from the area and disposed on land at the Kaunakakai Harbor.

Thank you again for your comments. A copy of the Draft EIS will be forwarded to you for further review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
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JAN 03 2005

ALAN M. ARAKAWA
MAYOR

OUR REFERENCE
YOUR REFERENCE

POLICE DEPARTMENT

COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

KEKUHAUPIO R. AKANA
DEPUTY CHIEF OF POLICE

December 27, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN) – Proposed Lahaina Small Boat Harbor Ferry Pier Improvements

Thank you for your letter of December 6, 2004, requesting comments on the above subject.

We have reviewed the information submitted for this project and have enclosed a copy of our comments. As always, thank you for giving us the opportunity to comment on this project. We hope you and your staff have a safe and happy holiday season.

Very truly yours,

Assistant Chief Sydney Kikuchi
for: Thomas M. Phillips
Chief of Police

c: Michael Foley, Planning Department

Enclosure

* State will need to address Homeland Security issues.
12/23/04

COPY

TO	**:**	**THOMAS PHILLIPS, CHIEF OF POLICE, COUNTY OF MAUI**
VIA	**:**	**CHANNELS**
FROM	**:**	**SCOTT Y. MIGITA, ACTING SERGEANT, LAHAINA SPECIALIZED UNITS**
SUBJECT	**:**	**PROPOSED LAHAINA SMALL BOAT HARBOR FERRY PIER IMPROVEMENTS**

Sir, this transmittal is being submitted regarding an Environmental Impact Statement Preparation Notice (EISPN) in reference to the Proposed Lahaina Small Boat Harbor Ferry Pier Improvements. Mr. Mich HIRANO, AICP, Planner, of Munekiyo & Hiraga, Inc. has prepared this notice for the State of Hawaii, Department of Land and Natural Resources and the Accepting Authority: Governor, State of Hawaii.

The State of Hawaii, Department of Land and Natural Resources is purposing to build a new ferry pier on the north side of the existing pier at the Lahaina Small Boat Harbor. This ferry pier will be used to accommodate the Lanai/Maui and Molokai/Maui ferries, cruise ship tenders, and commercial and recreational vessels. The new berthing area for the Carthaginian II replacement vessel is being considered on the north side of the new pier. This new ferry pier will measure thirty-five (35') feet in width and nearly one-hundred and fifteen feet (115') in length with a concrete walkway and safety railings for pedestrian access between the existing pier and the new ferry pier. The new pier will be situated in coastal waters approximately sixty feet (60') north of the harbor's existing pier.

In reference to the impact on traffic and safety issues from a police perspective, according page 32 of the manual, traffic impact considerations will be addressed in the Draft Environmental Impact Statement (EIS). Mentioned in this section is that due to the scenic location in the area with historical sites, retail shops, restaurants, and ocean recreational activities, the harbor area attracts many visitors. The volume of traffic and parking space in the area increases during peak visitor seasons and on Boat Days. The availability of parking within the harbor area is limited to existing on street parking stalls, bus loading zones, and public and private off street parking facilities.

During Boat Days, the area between the Pioneer Inn and the boat harbor is accessible only for parking at the Lahaina library and active loading and unloading at Pioneer Inn. As a result, traffic in the vicinity of Hotel and Front Street becomes congested with vehicular traffic. In addition to Boat Days, during weekends, there are art and cultural events taking place on a regular basis at the Banyan Tree along with keiki surf meets at Library Park.

Considering these events taking place alone or in combination with each other, traffic in this area may be overly congested during the construction phase of this project. One recommendation to alleviate the heavy traffic exiting the harbor area during construction would be to post traffic control personnel at the intersection of Papelekane and Front Street. Parking of construction equipment and construction workers' personal vehicles will also be a concern due to limited parking availability. Measures taken regarding this parking issue along with the hours and length of the construction operation would need to be addressed for traffic congestion solutions. Lahaina town special cultural events taking place on occasion also would need to be taken into consideration in terms construction operating hours.

In conclusion, the volume of traffic and availability of parking space within and around the Lahaina Small Boat Harbor remains a concern from a police standpoint during the construction phase as well as the operational phase of this project.

Submitted for your information and perusal.

CONCUR W/ THIS REPORT & RECOMMENDATIONS.
12/17/04

Scott Y. MIGITA, E-1122
A/Sgt.,Lahaina Specialized Unit
12/15/2004 at 1542 hours

MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICK" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Thomas Phillips, Chief of Police
Maui Police Department
County of Maui
55 Mahalani Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement

Dear Chief Phillips:

Thank you for your Department's letter of December 27, 2004 providing comments on the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, we wish to provide the following information in response to your comments.

A Traffic Impact Assessment Report (TIAR) was carried out for the proposed project by Wilson Okamoto Corporation. Peak traffic conditions around the harbor and at key intersections, including those intersections with Honoapiilani Highway, were assessed on Boat Days and Non Boat Days. Pedestrian numbers and movements around the harbor were also assessed and analyzed. The study found that most intersections around the harbor operated at acceptable levels of service. The intersection projected to experience poor levels of service in the future is the Dickenson Street/Honoapiilani Highway intersection. The TIAR, however, noted that the improvements at the harbor are proposed to alleviate existing conditions and safety concerns and will not generate any increase in ferry traffic. Therefore, the future traffic conditions are not from the ferry improvements, but from the general growth in traffic. The TIAR recommended that pedestrian movement be improved by extending the sidewalk on the north side of Hotel Street. The widening of the sidewalk, therefore, has been incorporated in the scope of the project. The findings and conclusion of the report will be discussed and included in the Draft EIS.

A traffic mitigation and control plan during construction will be submitted to the Department of Public Works for review and approval during the building permit application process. The plan will be developed to maintain efficient traffic operations during construction of the proposed improvements.

Thank you again for your comments. A copy of the Draft EIS will be sent to your department for review and comment.

Very truly yours,

MHirano

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
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ALAN M. ARAKAWA
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND ENVIRONMENTAL MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

TRACY TAKAMINE, P.E.
Wastewater Reclamation Division

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

Solid Waste Division

February 1, 2005

Mr. Mich Hirano, A.I.C.P.
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
LAHAINA SMALL BOAT HARBOR FERRY PIER IMPROVEMENTS
TMK: (2) 4-6-001:002

We reviewed the subject application and have the following comments:

1. Building permits are not required within the Conservation Districts.

2. In Chapter II, Description of Existing Environment, Subsection D, Infrastructure 1, Roadway System - please be advised that the information on County roadways is incorrect. Papalekane Street is not a County roadway as the land is owned by the State of Hawaii. This road was created when the State (not County) Library was constructed and the extension of Wharf Street to Market Place was cut off for the creation of the Brick Palace "park". Part of the roadway provides for library parking.

3. Please describe the traffic management controls that will be implemented during the construction period.

4. There are handicapped parking stalls near the lighthouse. Will these be affected by construction and if so, how will inconveniences to users be mitigated?

5. Describe the potential impacts to existing ferry/pier operations during the construction period and how they will be mitigated.

6. Americans with Disabilities Act (ADA) accessibility needs to be addressed.

7. Submit plan for recycling/disposal of demolition and construction waste.

8. A detailed and final drainage report and a Best Management Practices Plan (BMP) shall be submitted with the grading plans for review and approval prior to issuance of grading permits. The drainage report shall include hydrologic and hydraulic calculations and the schemes for disposal of runoff waters. It must comply with the provisions of the "Rules and Design of Storm Drainage Facilities in the County of Maui" and must provide verification that the grading and runoff water generated by the project will not have an adverse effect on adjacent and downstream properties. The BMP plan shall show the location and details of structural and nonstructural measures to control erosion and sedimentation to the maximum extent practicable.

9. A detailed, final Traffic Impact Assessment Report for the project shall be submitted for our review and approval. The report shall also address regional traffic impacts and include assessments from the local community police officer.

10. Preliminary construction plan submittal shall include a completed technical assistance review performed by the Disability and Communication Access Board (DCAB) for compliance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for all facilities. All technical and structural infeasible assessments shall be the responsibility of the developer and an agreement waiving the County of Maui of any future liability, including redesign and reconstruction for said facility shall be recorded with the State's Bureau of Conveyances.

Mr. Mich Hirano, A.I.C.P.
February 1, 2005
Page 3

If you have any questions regarding this letter, please call Michael Miyamoto at (808) 270-7845.

Sincerely,

for MILTON M. ARAKAWA, A.I.C.P.
Director

MMA:MMM:da
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MUNEKIYO & HIRAGA, INC.

MICHAEL T MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Milton Arakawa, Director
Department of Public Works
County of Maui
200 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Draft Environmental Impact Statement (EIS)

Dear Mr. Arakawa:

Thank you for your letter of February 1, 2005 providing comments on the subject Environmental Impact Statement Preparation Notice. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources (DLNR), the following information is provided in response to your comments. The responses are in the same order as presented in your letter.

1. The DLNR acknowledges that building permits are not required within the Conservation district.

2. Thank you for your clarification regarding the background and ownership of Papalekane Street. This will be corrected in the Draft EIS.

3. The traffic management controls that will be implemented during the construction period include the following measures. One (1) way traffic lanes on Hotel, Wharf and Papalekane Streets will be kept open to allow flow through traffic during construction. A traffic monitor will be present during roadway improvements to ensure vehicular and pedestrian safety.

4. The area near the lighthouse will be redeveloped to provide more efficient traffic circulation around the existing and proposed ferry pier and for passenger loading and unloading. The accessible stalls near the lighthouse will be relocated to the north side of Papalekane Street. The available parking at the relocated site will be increased by four (4) additional stalls. The new parking area will be constructed prior to the redevelopment of the existing parking area so that the availability of parking will not be adversely impacted during construction.

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhinconline.com

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5. The potential impacts to existing/pier operations during the construction period will be addressed by adherence to the construction methodology and mitigation measures attached herein as Exhibit "A".

6. The proposed project plans will be submitted to the Disability and Communication Access Board (DCAB) for review and compliance with Americans with Disabilities Act (ADA) requirements.

7. A detailed plan for recycling/disposal of demolition and construction waste will be submitted to Department of Public Works (DPW) during the building permitting process for the landside improvements.

8. A final detailed drainage report and a Best Management Practices Plan (BMP) will be submitted to DPW. The drainage report will comply with the provisions of the "Rules and Design of Storm Drainage Facilities in the County of Maui".

9. A Traffic Impact Assessment Report (TIAR) for the proposed improvements has been completed by Wilson Okamoto Corporation. The TIAR assessed regional traffic impacts and addresses the assessment from the local community police officer. The TIAR findings and recommendations will be included in the Draft EIS.

10. See response to Comment No. 6. All technical and infeasible assessment will be the responsibility of DLNR. DLNR will agree to waive the County of Maui of any future liability, including redesign and reconstruction for the proposed improvements, as required.

Thank you again for your comments. A copy of the Draft EIS will be forwarded to your Department for further review and comment.

Very truly yours,

MHirano

Mich Hirano, AICP
Project Manager

MH:tn
Enclosure
cc: Eric Hirano, Department of Land and Natural Resources (w/out enclosure)
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LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

June 22, 2006

Probable Construction Methodology and Mitigative Measures for "In-water" Construction

The "in-water" construction improvements includes the following:

1. Demolish the existing concrete catwalk and piles located on the North side of the existing pier;
2. Install temporary surfer access over the existing seawall and into the water near the range marker;
3. Construct new ferry pier approximately 116' long by 35' wide supported by foundation piles. The new ferry pier will be located 60 feet to the North of the existing pier. An open shade structure or structures will be constructed on the new pier;
4. Construct new 60' long by 16' wide walkway supported on foundation piles to connect the new ferry pier to the existing pier;
5. Dredge the entrance channel and berthing area. The dredging consists of maintenance and new (coral) dredging (approx. 2,500 C.Y.). The minimum channel dredged depth is -12' MLLW. The new (coral) dredging of approximately 2,720 S.F. is located to the North of the new pier and is needed to create a single berth;
6. Disposal of the dredged material at Kaunakakai Harbor on the island of Molokai is proposed;
7. Remove the Dolphin, a vessel grounded on the reef to the North of the new pier. The Dolphin is a steel hull, 42' long, 22-ton sail boat;
8. Transplant coral removed from the new dredging area to the "scar" created by the Dolphin;
9. Grout void under the existing seawall fronting the lighthouse;
10. Construct new surfer access from the new pier or existing seawall.

Construction Methodology:

1. Prepare and submit Best Management Practice (BMP) to DLNR and State DOH for approval;
2. Conduct "pre-dredge" bathymetric survey of area to be dredged;
3. Install off-shore moorings for construction related vessels;
4. Mobilize deck, crane, supply and/or transport barges; utility boat, equipment, supplies, tools and field office to the Lahaina Small Boat Harbor;

EXHIBIT "A"

5. Construct temporary surfer access;
6. Remove and dispose of the Dolphin, including the removal and replacement of offshore moorings if required to remove the Dolphin;
7. Install silt curtains and other necessary BMPs;
8. Remove the existing concrete catwalk and piles;
9. Removal select coral/algae from new (coral) dredging area and attach to "scar" created by the Dolphin;
10. Dredge entrance channel and turning basin;
11. Transport dredged material by barge to Kaunakakai Harbor for dewatering and disposal at a State approved site;
12. Grout void under the lighthouse;
13. Install foundation piles for walkway and new pier;
14. Install of decking for walkway and new pier;
15. Install fendering and utilities for new pier;
16. Install new surfer access;
17. Conduct "post-dredge" bathymetric survey of area that was previously dredged;
18. Remove silt curtains and other BMPs;
19. Demobilize vessels, field office, equipment, supplies and materials from the Lahaina Small Boat Harbor;
20. Clean up project site.

Site Specific Construction Notes:

1. The Contractor will not be permitted to stockpile materials and/or equipment on Wharf Street or the existing pier, except in a 40' X 20' area near the light house (to be designated by the Harbor Master);
2. DLNR will provide a temporary slip in the harbor for the Contractor's utility boat;
3. DLNR will provide the Contractor with off-site mooring space. The Contractor will be required to install and maintain their own moorings;
4. The North face of the existing pier and 30' berthing area adjacent to the pier shall be open at all times, unless prior approval from the Harbor Master is obtained;
5. The Dolphin shall be floated off the reef to minimize damage to the coral heads and/or adjacent reef.

Possible Adverse Impacts from Construction-activities:

This preliminary assessment identified possible environmental, cultural and social impacts from the "in-water" construction. Additional impacts may be identified as the planning environmental phase progresses and/or in the design phase.

1. The construction-activities will disrupt existing harbor/pier operations, at a harbor that is considered to be one of the busiest harbor's in the State;
2. The construction of "in-water" improvements are anticipated to result in direct and secondary adverse impacts to marine fish and wildlife resources. These impacts include the direct loss of coral reef resources (including corals, coralline algae, macro-algae, invertebrates) and sand habitat from dredging operations; and construction of the new pier and walkway;

3. The construction-related activities will mobilize sediments that may migrate, abrade, settle on, and smother corals, coralline algae, and macro-algae. The suspension of sediments may result in the temporary degradation of water quality, which may reduce the ability of the coral reef ecosystem to support certain functions such as foraging by sea turtles; coral replenishment, and general marine species recruitment, foraging, nesting, and sheltering from predators;
4. The construction-related activities may impact adjacent historic/cultural sites, including the light house, Brick Palace (associated with Kamehameha), and the Hauola Stone (Birthing Stone);
5. The pile driving may impact the adjacent light house, sea wall, historic Pioneer Inn and Hauola Stone;
6. The construction-related activities will impact surfer access to the surf break known as "Harbor", which is located seaward of the new ferry pier;
7. The construction-related activities may generate noise and air pollution above existing background levels;
8. The barge mounted crane and other equipment will impact the view plane from the Pioneer Inn and adjacent shoreline;
9. The construction-related activities may impact fishing in and adjacent to the new pier.

Mitigative Measures:

The Contractor will be required to comply with the Mitigation/Compensatory Plan and Coral Mitigation Plan. Both plans will be prepared by DLNR in coordination with the U.S. Fish and Wildlife Services, National Marine Fisheries Services, Department of Army and Environmental Protection Agency. The Contractor will be required to prepare and submit a site specific Best Management Practices Plan (BMP) to the State Department of Health and DLNR for review and approval, prior to the start of construction. The BMP shall include mitigative measures to reduce turbidity and/or discharge of sediment and contaminants into the surrounding waters. In addition, the Contractor will be required to comply with the General BMPs provided by the National Marine Fisheries Service (See attachment A) and Contract Specifications to reduce water, noise and air pollution.

The following mitigative measures will be implemented to address adverse impacts noted in the previous section:

1. The Contractor shall coordinate construction-related activities with the Harbor Agent to minimize disruptions to the harbor;
2. The direct and indirect impacts to marine fish and wildlife will be mitigated through the implementation of the provisions in the Mitigation/Compensatory Plan and Coral Mitigation Plans;
3. The sediment generated by the construction-related activities will be mitigated by the use of silt curtains and implementation of BMPs;
4. The construction-related activities will take place mainly in the water. Only a 40' by 20' area next to the light house will be utilized by the Contractor;
5. The Contractor will be required to predrill and grout foundation piles in place;
6. The Contractor will be required to construct a temporary surfer access;

7. The Contractor will be required to mitigate air and noise pollution through the implementation of BMPs;
8. The visual impacts of construction equipment is temporary;
9. The impacts to fishers are temporary and fishing could occur when the Contractor is not working.

General Best Management Practices (BMPs):

1. The Contractor shall prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60 - Air Pollution Control;
2. Noise shall be kept within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 - Community Noise Control. The Contractor shall obtain and pay for the Community Noise Permit from the State Department of Health when the construction equipment or other devices emit noise at levels exceeding the allowable limits;
3. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels;
4. Pile installation operations shall be confined to the period between 8:00 a.m. and 5:30 p.m;
5. Starting-up of construction equipment exceeding allowable noise limits shall not be done prior to 6:45 a.m. without prior approval of the Engineer;
6. No dumping of waste concrete, building materials and/or debris will be permitted at the job-site;
7. Care shall be taken to ensure that no petroleum products, bituminous materials or other deleterious substances are allowed to fall, flow, leach or otherwise enter the harbor waters;
8. The Contractor shall control fugitive dust from entering harbor waters;
9. The Contractor shall not allow any debris or building materials to be blown and/or dropped into the harbor waters. Any debris or waste blown or dropped into the water shall be immediately retrieved by the Contractor.

ATTACHMENT A

Best Management Practices
National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Pacific Islands Regional Office, Protected Resources Division

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a. Turbidity and siltation from project-related work should be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

b. Any construction-related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at the conclusion of the construction work.

c. All project-related materials and equipment placed in the water should be free of pollutants.

d. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, etc.)

e. No contamination (trash or debris disposal, alien species introductions etc.) of marine (reef flats, lagoons, open ocean, etc.) environments adjacent to the project site should result from project-related activities.

f. Fueling of project-related vehicles and equipment should take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site should be developed. Absorbent pads, containment booms and skimmers will be stored on-site to facilitate the cleanup of petroleum spills.

g. Underlayer fills will be protected from erosion with core-loc units (or stones) as soon after placement as practicable.

h. Attempts must be made to prevent discharge of dredged material into the marine environment during the transporting and off-loading of dredged material.

i. Return flow of or run-off from dredged material stored at inland dewatering or storage sites must be prevented.

j. Avoid drift to waterways and non-target sites.

k. Protect desirable non-target vegetation from overspray. Tarps may be needed in some situations.

Last updated December 23, 2004

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

DEC 29 2004

COUNTY OF MAUI
DEPARTMENT OF PLANNING

December 29, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

RE: EISPN – Proposed Lahaina Small Boat Harbor Ferry Pier Improvements located at TMK: 4-6-001: 002, 014, and 017, Lahaina, Island of Maui, Hawaii (LTR 2004/4500)

The Maui Planning Department (Department) received your request for preconsultation comments for an Environmental Impact Statement Preparation Notice (EISPN) prepared in accordance with Chapter 343, HRS. The Department's comments are as follows:

1. The discussion of traffic impacts should assume full operational use of the existing and proposed piers.

2. Include a discussion of impacts from increased pedestrian use assuming full operational use of the existing and proposed piers.

3. Discuss the parking provisions for the area.

4. The Coastal Engineering Report should include a discussion of potential impacts on the nearshore reef during the construction phase and following full operational use.

5. Discuss the use of Mala Wharf as an alternate site.

6. The Cultural Resources Commission (CRC) will be reviewing and commenting on the EISPN at the January 6, 2004, meeting. Any comments received will be forwarded under separate cover.

Thank you for the opportunity to comment. Please include the Department on the distribution list for the Draft EIS. Should you require additional clarification, please contact Ms. Kivette A. Caigoy, Environmental Planner, at 270-7735.

Sincerely,

MICHAEL W. FOLEY
Planning Director

MWF:KAC:do
c: Wayne A. Boteilho, Deputy Planning Director
Clayton I. Yoshida, AICP, Planning Program Administrator
Kivette A. Caigoy, Environmental Planner
Dawn Duensing, Cultural Resources Planner
Project File
General File
K:\WP_DOCS\PLANNING\EIS\PrepNotices\4500_LahainaPierImprvmts.wpd

MUNEKIYO & HIRAGA, INC.

Michael T Munekiyo
Gwen Ohashi Hiraga
Mitsuru "Mich" Hirano
Karlynn Kawahara

Mark Alexander Roy

December 14, 2007

Jeffrey S. Hunt, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai`i 96790

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements
Environmental Impact Statement (EIS)

Dear Mr. Hunt:

Thank you for your department's letter of December 29, 2004, providing comments on the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, the following information is presented in response to your comments. The responses are in the same order as your comments.

1 A Traffic Impact Assessment Report (TIAR) for the project has been prepared by Wilson Okamoto Corporation. Traffic counts at peak periods have been carried out during Boat Days and Non Boat Days. Both these periods have been analyzed with respect to the full operational use of the existing level of activity at the boat harbor and in the year 2010 with the proposed improvements. Discussion of the findings and conclusion of the TIAR will be included in the Draft EIS.

2. Pedestrian counts and assessment of pedestrian movements have also been included in the TIAR.

3. A parking analysis has been included in the TIAR. The proposed improvements include redeveloping the area at the entrance to the existing pier to create a more efficient zone for passenger loading and drop-off. The existing parking in this area will be relocated to Papalekane. The parking near the pier will be expanded by four (4) additional parking stalls, including an accessible stall. A parking survey was carried out by the Department of Land and Natural Resources. There are a total of 690 marked parking stalls, 40 unmarked parking stalls, 10 bus parking stalls, and 6 limousine parking stalls in and around the harbor. Provision of parking will be discussed in the Draft EIS.

305 High Street, Suite 104 • Wailuku, Hawaii 96793 • ph: (808)244-2015 • fax: (808)244-8729 • planning@mhinconline.com

environment planning government

4. The Coastal Engineering Report will include an analysis of the potential impacts on the nearshore reef during construction and following full operational use.

5. An analysis of alternative sites will be included in the Draft EIS. Alternative sites under consideration include Mala Wharf and Ke Kaa Point.

6. Representatives of the project team attended the Cultural Resources Commission meeting to present information on the project and to receive comments on the EIS Preparation Notice.

Thank you again for your comments. A copy of the Draft EIS will be forwarded to the Department of Planning for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
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ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 7, 2005

Mr. Peter T. Young, Chairperson
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
333 Queen Street, Suite 300
Honolulu, Hawaii 96813

Dear Mr. Young:

RE: Environmental Impact Statement Preparation Notice for the proposed Lahaina Small Boat Harbor Ferry Pier Improvements, Lahaina, Maui, Hawaii (LTR 2005/0087)

The Maui County Cultural Resources Commission (CRC) discussed the subject project at its regular meeting on January 6, 2005. The CRC offers the following comments:

1. Please identify alternative sites for this project. Lahaina is already impacted by existing congestion in the central Historic District.

2. Please address the impact of this project and related boat traffic on surfing. Surfing is an important cultural activity, and the surfing grounds in this area are considered historic sites. Field studies should be conducted to determine any impacts on surfing areas.

3. The Small Boat Harbor, seawall, and surfing grounds should be considered as historic sites. Thorough research by a qualified historian/architectural historian should be conducted as part of this study. Please note that "the Old Fort" is not a historic site.

4. Please discuss the proposed project's "land-based improvements" as part of the Draft EIS. What will these be and how will they impact the historic district?

5. Please include in the Draft EIS a study of carrying capacities of Lahaina's existing sidewalks, streets, and parking areas as these facilities are already quite congested.

6. As part of the Section 106 process, long-term and cumulative impacts to the Historic District must be addressed. We remind you that the FTA is responsible for all findings. As this project is located in a National Historic Landmark, the FTA should notify and invite the Advisory Council on Historic Preservation and the Secretary of the Interior National Park Service to participate in this action.

7. The planning process for the proposed project must also include Section 4(f) of the US Department of Transportation Act of 1966.

8. Please notify individual Cultural Resources Commission members of all public meetings for this project.

Thank you for this opportunity to comment. If additional clarification is required, please contact Ms. Dawn E. Duensing, Cultural Resources Planner, at 270-7841.

Sincerely,

Lori Sablas

LORI SABLAS, Chairperson
Maui County Cultural Resources Commission

LS:DED:jlp
c: Alan Arakawa, Mayor, County of Maui
Michael W. Foley, Director, Maui Planning Department
Kyle Ginoza, Director, Maui Department of Transportation
Gil Coloma-Agaran, Director, Department of Public Works & Environmental Management
Carol Braegelmann, Federal Transit Administration
Melanie Chinen, State Historic Preservation Division
Dawn Duensing, Cultural Resources Planner
Mich Hirano, AICP, Munekiyo and Hiraga, Inc.
CRC members
General File
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MUNEKIYO & HIRAGA, INC.

Michael T Munekiyo
Gwen Ohashi Hiraga
Mitsuru "Mich" Hirano
Karlynn Kawahara

Mark Alexander Roy

December 14, 2007

Samuel Kalalau, Chairperson
Cultural Resources Commission
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai`i 96790

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements Environmental Impact Statement

Dear Mr. Kalalau:

Thank you for the Cultural Resources Commission letter of December 29, 2005 providing comments on the subject project. On behalf of the Proposing Agency, State of Hawai`i Department of Land and Natural Resources, the following information is presented in response to your comments. The responses are in the same order as your comments.

1. An analysis of alternative sites will be included in the Draft EIS. Alternative sites under consideration include Mala Wharf and Ke Kaa Point.

2. The applicant acknowledges the importance of surfing and the cultural significance of this activity. An Oceanographic Design Criteria and Coastal Engineering Assessment was prepared by EKNA Services, Inc., for the proposed project. The study assessed wave and current patterns in and around the Lahaina Small Boat Harbor and concluded the proposed dredging will not adversely impact the existing surf sites. The findings and conclusions of the potential impacts on surf sites will be discussed and included in the Draft EIS.

3. An Archaeological Assessment of the project area, as well as a cultural impact assessment has been carried out by Pacific Legacy, Inc. The discussion of the findings of these assessments will be included in the Draft EIS. Your comment on the "Old Fort" is noted and has been corrected.

4. Full discussion and analysis of the proposed land-based improvements will be included in the Draft EIS.

5. A Traffic Impact Assessment Report (TIAR) has been prepared for the proposed project by Wilson Okamoto Corporation. This study has analyzed the carrying capacity of the existing streets, key intersections and pedestrian movements during Boat Days and Non Boat Days. The TIAR also has included assessment of pedestrian movements and parking capacity in and around the Lahaina Small Boat Harbor. This information will be discussed and included in the Draft EIS.

6. Coordination has been carried out under the National Historic Preservation Act, Section 106 consultation. The applicant has contacted the State Historic Preservation Officer, and the National Parks Service, as well as with native and cultural organizations as part of the Section 106 consultation. This contact will be ongoing during the completion of the EIS process and through to the execution of a Memorandum of Agreement (MOA) with native and cultural organizations.

7. A Section 4(f) analysis pursuant to the U.S. Department of Transportation Act of 1966 will also be carried out for the subject project. This assessment will be included in the Draft EIS.

8. The applicant confirms that the Cultural Resources Commission will be notified of all public meetings for this project. The applicant also intends to present the findings of the Draft EIS to the Cultural Resources Commission and receive comments on the Draft EIS during the 45-day comment period. The applicant will be coordinating with the Department of Planning to schedule a meeting with the Cultural Resources Commission for this presentation and review.

Very truly yours,

MHirano

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
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FEB 17 2005

ALAN M. ARAKAWA
MAYOR

GEORGE Y. TENGAN
Director
JEFFREY T. PEARSON, PE
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 South High Street
WAILUKU, MAUI, HAWAII 96793
Telephone (808) 270-7816 • Fax (808) 270-7833

February 14, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku HI 96793

SUBJECT: Proposed Lahaina Small Boat Harbor Ferry Pier Improvements - demolition of existing pier that provides access to the ship and build a new ferry pier to the north of the existing pier- TMK (2) 4-6-001:002

Dear Mr. Hirano:

Thank you for the opportunity to provide comments on this project proposal.

Source Availability and Consumption

The project area is served by our Lahaina system with Launiupoko aquifer as major source of water. As of December 2004, pending projects in West Maui at some stage of discretionary review total roughly 15.8 MGD, of which about 7.1 MGD plan to connect to the county system. DWS does NOT grant or imply any guarantee of water until an application for water meter has been received and reviewed. Should larger or additional meter be required for this project, water availability will be determined at time of meter application or meter reservation.

The EA should include expected potable and non-potable water uses for the proposed improvements. The new pier will be on approximately 4,000 sf. The existing pier on approximately 8,000 sf contains a harbor master's office, a ferry kiosks, fish hoist and diesel fuel dispensing and sewer pumping facilities. It has an average daily use of 13,250 gpd.

System Infrastructure

The project site is served by a 12-inch waterline along Wharf Street, 1 1/2-inch water meter and a fire hydrant situated within 250 feet of the parcel. The applicant will be required to submit domestic and fire flow calculations during the building permit process to determine meter capacity and adequate fire protection. Installation of reduced pressure back-flow prevention approved by the Department will likewise be required if one does not already exist.

Conservation

We suggest that the applicant consider the use of brackish or reclaimed water sources for all non-potable water uses including dust control during construction. Reclaimed water is readily available at the Lahaina Wastewater Facility.

Pollution Prevention

In order to protect ground and surface water resources, we recommend that the applicant adopt Best Management Practices (BMPs) designed to minimize infiltration and runoff from construction, vehicle operations as well as from daily activities. We have attached sample BMPs for bridge demolition and removal. We ask the applicant to take precautionary measures during demolition and construction to prevent construction materials and debris and eroded soils from entering coastal waters.

Should you have any questions regarding system infrastructure and requirements, please call our Engineering Division at 270-7835 and any questions on source availability or conservation and resource matters, please contact our Water Resources and Planning Division at 270-7199.

Sincerely,

George Y. Tengan
Director

eam
c: Engineering Division

attachments:

BMPs on Bridge Demolition and Removal - NC, Department of Transportation, 09-20-1999
Selected BMP's from "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters"-EPA
BMPs for Boatyards/Marinas - Residential and Commercial Source Control Programs, WERF 1998
BMPs for Fuel Stations - Water Quality Best Management Practices Manual for Commercial and Industrial Businesses

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LAND_USE: Bridges/Piers
SOURCE:

EFFECTS: Minimize impact on water quality and aquatic life
REFERENCE: North Carolina Dept of Transportation, 09-20-1999
PICTURE:

PRACTICE: Bridge Demolition and Removal

1. If the bridge is to be removed in a fashion such that there is a practical alternative to dropping bridge components into the water, that alternative should be followed. In the case of a concrete deck, the bridge deck should be removed by sawing completely through the concrete thickness. Removal may be in sections out between the beams or a cut full length of span between the beams. No part of the structure should be allowed to fall into the water. The concrete should be removed from the site intact and placed/retained in an upland disposal area.

2. If it is determined that components of the bridge must be dropped into the water, all efforts should be made to minimize the overall impact to the surface waters. If the bridge is composed of several spans, the demolition should occur one at a time. Components from a given span which have been dropped into the water must be removed from the water before demolition can proceed to the next span.

3. If it is determined that components of the bridge must be dropped into the water, any and all asphalt wearing surface should be removed and not dropped into the water.

4. If the substructure of a bridge includes timber or steel piles, they should be removed by cutting them off level with surface of the streambed. In no circumstances are the piles to remain above the surface of the streambed. This should be accomplished in a fashion which minimizes the increase of sediment into the surface waters. As an exemption, piles that are in conflict with the proposed piers may be completely removed by pulling. Timber and steel piles should be removed in a fashion that does not allow the pile to fall into the water. In tidal areas it may be necessary to remove the piers completely or to some depth below the substrate because of sand/current movement over time.

5. Any machine operating in an area which could leak engine fluids into the water should be inspected visually on a daily basis for leakage. If leakage is found, the fluid(s) should be contained and removed immediately in accordance with applicable state regulations and guidelines, as well as the equipment repaired prior to further use.

6. When pumping to de-water a drilled shaft pier, the discharge should be into an acceptable sediment containment bin to minimize siltation in the water.

LAND_USE: Boatyards/Marinas

SOURCE: Hazardous wastes

EFFECTS: Minimize pollutants from boatyards and marinas

REFERENCE: Residential & Commercial Source Control Programs..WERF 1998

PICTURE:

PRACTICE: Pollutants from boatyards and marinas include paint, wood preservatives, solvents, degreasers, engine fluids, bilge wastes, and boat sewage. The pollutants are generated from hydroblasting (pressure washing) or stripping to remove paint, painting, engine maintenance, bilge pumping , sewage disposal, and onsite spills. Paint removal wastes constitute the major waste problem at boatyards. Hydroblasting yields runoff containing paint chips that can possibly reach adjacent waterways. Chemical stripping produces a toxic sludge that must be disposed of as hazardous waste.

Pressure Washing and Surface Preparation. Prevent runoff from hydroblasting and any abrasives, dust, or paint chips from reachinf waterways or storm drains. For boatyards without settling tanks, lay tarps around the vessels and sweep up any remaining paint chips after the tarps are removed.

Painting. Train employees on proper spraying techniques. Mix paints in designated areas away from waterways..

Engine Maintenance. Use good housekeeping techniques, clean up spills thoroughly, and properly dispose of any wastes that are generated.

Materials Handling and Disposal. Store materials in protected, secure locations away from drain openings. Provide secondary containment when required. Label containers with correct information regarding the type and characteristics of its contents. Do not comingle wastes.

Boat sewage. Discharge sanitary wastes to a dockside pump-out station that is discharged to a sanitary sewer system or to a commercial waste disposal company. Most marinas provide this service. Another alternative is to arrange for pump-out service provided by commercial "tank-boats".

Bilge Water. Bilge water sometimes contain oils and solvents that should not be discharged to the sanitary sewer. Prior to discharge to sanitary sewer, oil shoud be decanted. Decanted oil may be disposed at used-oil collection centers. Residual surface oil can be absorbed by an oil-absorbing blanket. Bilge water may then be discharged tio the sanitary sewer.

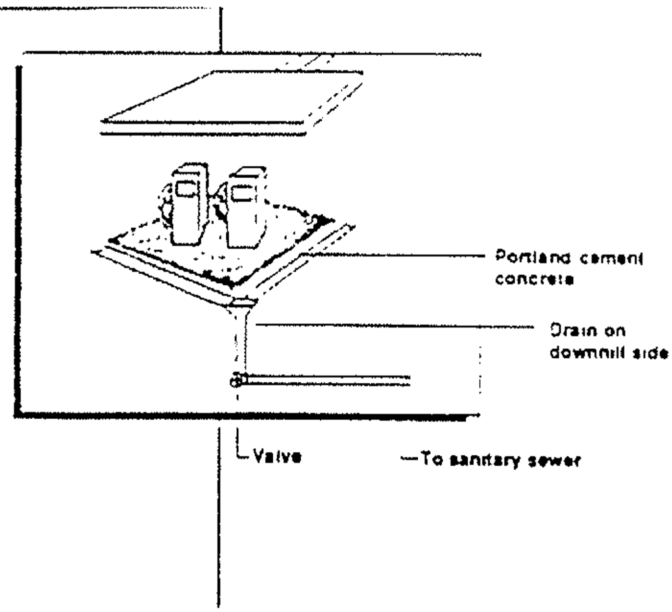
LAND_USE: Fuel station

SOURCE: Fuel handling

EFFECTS: Prevent compounds and metals to reach ground and surface water sources

REFERENCE: Water Quality, Best Management Practices Manual for Commercial and Industrial Businesses

PICTURE:



st Management Practices: Source Control 6/89

PRACTICE: Fueling Stations:

In addition to general service gas stations, fueling may also occur at 24-hour convenience stores, construction firms, warehouses, car washes, and businesses with fleet vehicles. Fuels contain organic compounds and metals that adversely affect aquatic life.

1. The fuel island shall be covered to prevent the direct entry of precipitation. See graphic field.
2. Longitudinal drains shall be located at the perimeter along the "downhill" side of the island. This drain shall be connected to the sanitary sewer. The drain shall have a valve to allow shutoff in the event of a large fuel spill.
3. The island shall be paved using Portland cement concrete, not asphalt.
4. Suitable cleanup materials shall be kept on site to allow prompt cleanup.

No waste liquids or chemicals of any kind are to be discharged to the storm sewers. Antifreeze and radiator flush can be discharged to the Sanitary sewers. All other liquids shall be recycled or properly disposed to permitted landfills.

Washing or steam cleaning of vehicles or vehicle parts outside shall occur in a designated area incorporating the requirements of BMP for steamcleaning.

Businesses generating Dangerous Wastes shall properly segregate and dispose the wastes as required by state regulations.

If stored above ground, waste container drums shall be kept inside the service bay; or if kept outside, be covered by a "lean-to" structure that keeps rainfall from reaching the drums (see BMP for above ground storage).

Dumpsters that store items awaiting transfer to a landfill such as used oil filters shall also be located in a lean-to (see BMP for above ground storage).

-Signs shall be painted on storm drain inlets to indicate that they are not to receive liquid or solid wastes.

-No waste liquids or chemicals of any kind are to be discharged to the storm sewers. Antifreeze and radiator flush can be discharged to the sanitary sewers. All other liquids shall be recycled or properly disposed to permitted landfills.

STORMWATER-TREATMENT BMPs: Stormwater from parking and maintenance areas where dripping oil or hydraulic fluids is likely to be occurring shall be treated by an API or CPI-separator (see BMP for oil/water separation).

Stormwater runoff from rooftops shall discharge to the storm sewer below the treatment system as long as the County's drainage requirements are met.

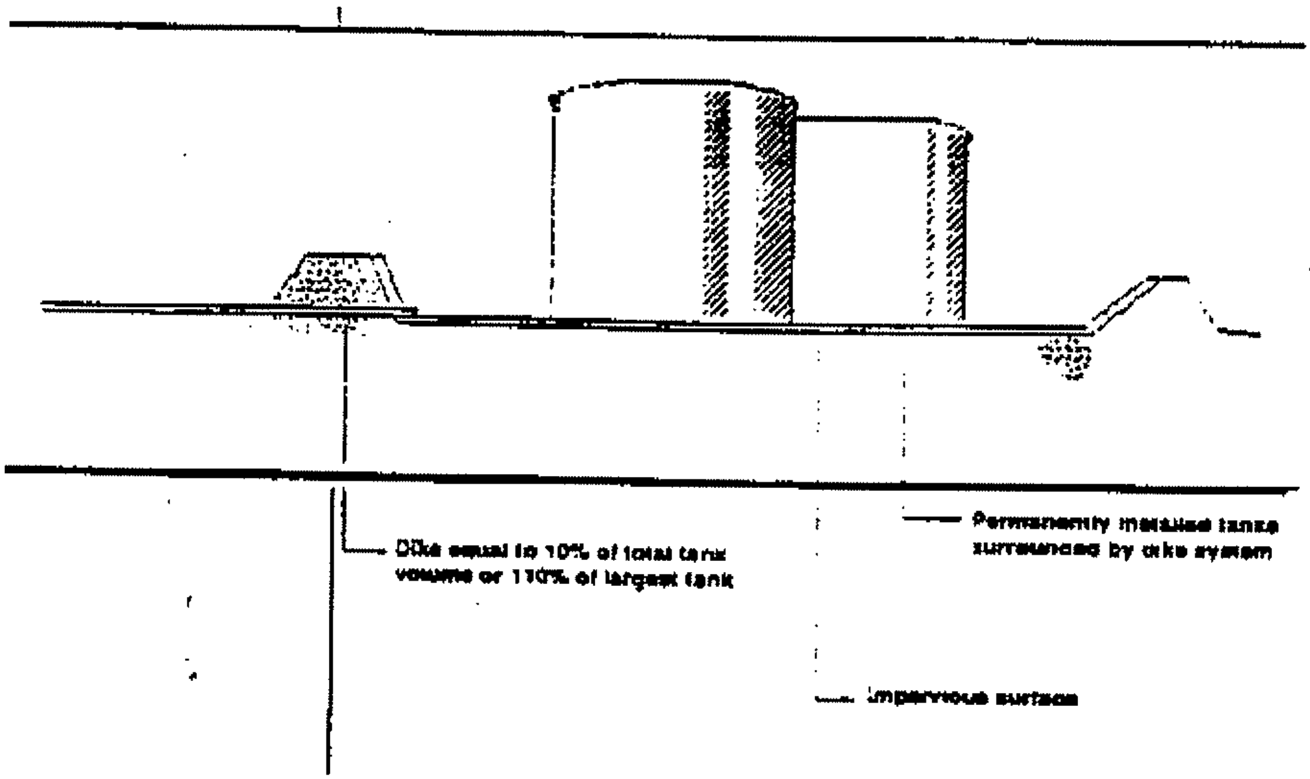
LAND_USE: Chemical or petroleum above ground storage

SOURCE: Spills and leaks from ASTs

EFFECTS: Prevent spills and leaks

REFERENCE: Water Quality, Best Management Practices Manual for Commercial and Industrial Businesses

PICTURE:



PRACTICE: ABOVE GROUND TANK STORAGE PERMANENT TANK STORAGE

1. The tank shall include an overfill protection system to minimize the risk of spillage during loading.

2. Permanently installed tanks are to be surrounded by a dike system as illustrated (see graphic field) The dike shall be of sufficient height to provide a volume within the diked area equal to 10% of the total tank storage or 110% volume of the largest tank whichever is greater.

3. The dikes and the surface within the dike area shall be sufficiently impervious to prevent loss of the stored material in the event of spillage.

4. Outlets from the tank area shall have positive control to prevent the uncontrolled discharge from the tank area of spilled chemicals or petroleum products.

5. The outlet shall have a sump for the collection of small spills. It shall be cleaned weekly to minimize the contamination of stormwater.

6. During the wet season, accumulated stormwater shall be released frequently.

7. For petroleum tank farms the stormwater shall pass through an oil/water separator

TEMPORARY TANK STORAGE OF LIQUIDS

1. A secondary containment system shall be used whenever liquids are temporarily stored in a portable tank

United States
Environmental Protection
Agency

Office of Water
Washington, DC 20460

840-B-92-002
January 1993

EPA

Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters

Issued Under the Authority of
Section 6217(g) of the Coastal Zone Act
Reauthorization Amendments of 1990

III. CONSTRUCTION ACTIVITIES

A. Construction Site Erosion and Sediment Control Management Measure

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and

(2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

1. Applicability

This management measure is intended to be applied by States to all construction activities on sites less than 5 acres in areas that do not have an NPDES permit[3] in order to control erosion and sediment loss from those sites. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The goal of this management measure is to reduce the sediment loadings from construction sites in coastal areas that enter surface waterbodies. This measure requires that coastal States establish new or enhance existing State erosion and sediment control (ESC) programs and/or require ESC programs at the local level. It is intended to be part of a comprehensive land use or watershed management program, as previously detailed in the Watershed and Site Development Management Measures. It is expected that State and local programs will establish criteria determined by local conditions (e.g., soil types, climate, meteorology) that reduce erosion and sediment transport from construction sites.

Runoff from construction sites is by far the largest source of sediment in urban areas under development (York County Soil and Water Conservation District, 1990). Soil erosion removes over 90 percent of sediment by tonnage in urbanizing areas where most construction activities occur (Canning, 1988). Table 4-14 illustrates some of the

[3] On May 27, 1992, the United States Court of Appeals for the Ninth Circuit invalidated EPA's exemption of construction sites smaller than 5 acres from the storm water permit program in *Natural Resources Defense Council* v. *EPA*, 965 F.2d 759 (9th Cir. 1992). EPA is conducting further rulemaking proceedings on this issue and will not require permit applications for construction activities under 5 acres until further rulemaking has been completed.

measured sediment loading rates associated with construction activities found across the United States. As seen in Table 4-14, erosion rates from natural areas such as undisturbed forested lands are typically less than one ton/acre/year, while erosion from construction sites ranges from 7.2 to over 1,000 tons/acre/year.

Table 4-14. Erosion and Sediment Problems Associated With Construction

Location	Problem	Reference
United States	Sediment loading rates vary from 36.5 to 1,000 ton/ac/yr. These are 5 to 500 times greater than those from undeveloped land. Approximately 600 million tons of soil erodes from developed sites each year. Construction site sediment in runoff can be 10 to 20 times greater than that from agricultural lands.	York County Soil and Water Conservation District, 1990
Franklin County, FL	Sediment yield (ton/ac/yr): forest < 0.5 rangeland < 0.5 tilled 1.4 construction site 30 established urban < 0.5	Franklin County, FL
Wisconsin	Erosion rates range from 30 to 200 ton/ac/yr (10 to 20 times those of cropland).	Wisconsin Legislative Council, 1991
Washington, DC	Erosion rates range from 35 to 45 ton/ac/yr (10 to 100 times greater than agriculture and stabilized urban land uses).	MWCOG, 1987
Anacostia River Basin, VA, MD, DC	Sediment yields from portions of the Anacostia Basin have been estimated at 75,000 to 132,000 ton/yr.	U.S. Army Corps of Engineers, 1990
Washington	Erosion rates range from 50 to 500 ton/ac/yr. Natural erosion rates from forests or well-sodded prairies are 0.01 to 1.0 ton/ac/yr.	Washington Department of Ecology, 1989
Anacostia River Basin, VA, MD, DC	Erosion rates range from 7.2 to 100.8 ton/ac/yr.	USGS, 1978
Alabama North Carolina Louisiana Oklahoma Georgia Texas Tennessee Pennsylvania Ohio Kentucky	1.4 million tons eroded per year. 6.7 million tons eroded per year. 5.1 million tons eroded per year. 4.2 million tons eroded per year. 3.8 million tons eroded per year. 3.5 million tons eroded per year. 3.3 million tons eroded per year. 3.1 million tons eroded per year. 3.0 million tons eroded per year. 3.0 million tons eroded per year.	Woodward-Clyde, 1991

Eroded sediment from construction sites creates many problems in coastal areas including adverse impacts on water quality, critical habitats, submerged aquatic vegetation (SAV) beds, recreational activities, and navigation (APWA, 1991). For example, the Miami River in Florida has been severely affected by pollution associated with upland erosion. This watershed has undergone extensive urbanization, which has included the construction of many commercial and residential buildings over the past 50 years. Sediment deposited in the Miami River channel contributes to the severe water quality and navigation problems of this once-thriving waterway, as well as Biscayne Bay (SFWMD, 1988).

ESC plans are important for controlling the adverse impacts of construction and land development and have been required by many State and local governments, as shown in Table 4-13 (in the Site Development section of this chapter). An ESC plan is a document that explains and illustrates the measures to be taken to control erosion and sediment problems on construction sites (Connecticut Council on Soil and Water Conservation, 1988). It is intended that existing State and local erosion and sediment control plans may be used to fulfill the requirements of this management measure. Where existing ESC plans do not meet the management measure criteria, inadequate plans may be enhanced to meet the management measure guidelines.

Typically, an ESC plan is part of a larger site plan and includes the following elements:

- Description of predominant soil types;
- Details of site grading including existing and proposed contours;
- Design details and locations for structural controls;
- Provisions to preserve topsoil and limit disturbance;
- Details of temporary and permanent stabilization measures; and
- Description of the sequence of construction.

ESC plans ensure that provisions for control measures are incorporated into the site planning stage of development and provide for the reduction of erosion and sediment problems and accountability if a problem occurs (York County Soil and Water Conservation District, 1990). An effective plan for urban runoff management on construction sites will control erosion, retain sediments on site, to the extent practicable, and reduce the adverse effects of runoff. Climate, topography, soils, drainage patterns, and vegetation will affect how erosion and sediment should be controlled on a site (Washington State Department of Ecology, 1989). An effective ESC plan includes both structural and nonstructural controls. Nonstructural controls address erosion control by decreasing erosion potential, whereas structural controls are both preventive and mitigative because they control both erosion and sediment movement.

Typical nonstructural erosion controls include (APWA, 1991; York County Soil and Water Conservation District, 1990):

- Planning and designing the development within the natural constraints of the site;
- Minimizing the area of bare soil exposed at one time (phased grading);
- Providing for stream crossing areas for natural and man-made areas; and
- Stabilizing cut-and-fill slopes caused by construction activities.

Structural controls include:

- Perimeter controls;
- Mulching and seeding exposed areas;
- Sediment basins and traps; and
- Filter fabric, or silt fences.

Some erosion and soil loss are unavoidable during land-disturbing activities. While proper siting and design will help prevent areas prone to erosion from being developed, construction activities will invariably produce conditions where erosion may occur. To reduce the adverse impacts associated with construction, the construction management measure suggests a system of nonstructural and structural erosion and sediment controls for incorporation into an

ESC plan. Erosion controls have distinct advantages over sediment controls. Erosion controls reduce the amount of sediment transported off-site, thereby reducing the need for sediment controls. When erosion controls are used in conjunction with sediment controls, the size of the sediment control structures and associated maintenance may be reduced, decreasing the overall treatment costs (SWRPC, 1991).

3. Management Measure Selection

This management measure was selected to minimize sediment being transported outside the perimeter of a construction site through two broad performance goals: (1) reduce erosion and (2) retain sediment onsite, to the extent practicable. These performance goals were chosen to allow States and local governments flexibility in specifying practices appropriate for local conditions.

While several commentors responding to the draft (May 1991) guidance expressed the need to define "more measurable, enforceable ways" to control sediment loadings, other commentors stressed the need to draft management measures that do not conflict with existing State programs and allow States and local governments to determine appropriate practices and design standards for their communities. These management measures were selected because virtually all coastal States control construction activities to prevent erosion and sediment loss.

The measures were specifically written for the following reasons:

(1) Predevelopment loadings may vary greatly, and some sediment loss is usually inevitable;

(2) Current practice is built on the use of systems of practices selected based on site-specific conditions; and

(3) The combined effectiveness of erosion and sediment controls in systems is not easily quantified.

4. Erosion Control Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Erosion controls are used to reduce the amount of sediment that is detached during construction and to prevent sediment from entering runoff. Erosion control is based on two main concepts: (1) disturb the smallest area of land possible for the shortest period of time, and (2) stabilize disturbed soils to prevent erosion from occurring.

■ a. *Schedule projects so clearing and grading are done during the time of minimum erosion potential.*

Often a project can be scheduled during the time of year that the erosion potential of the site is relatively low. In many parts of the country, there is a certain period of the year when erosion potential is relatively low and construction scheduling could be very effective. For example, in the Pacific region if construction can be completed during the 6-month dry season (May 1 - October 31), temporary erosion and sediment controls may not be needed. In addition, in some parts of the country erosion potential is very high during certain parts of the year such as the spring thaw in northern areas. During this time of year, melting snowfall generates a constant runoff that can erode soil. In addition, construction vehicles can easily turn the soft, wet ground into mud, which is more easily washed offsite. Therefore, in the north, limitations should be placed on grading during the spring thaw (Goldman et al., 1986).

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■ b. *Stage construction.*

،void areawide clearance of construction sites. Plan and stage land disturbance activities so that only the area urrently under construction is exposed. As soon as the grading and construction in an area are complete, the area hould be stabilized.

ʒy clearing only those areas immediately essential for completing site construction, buffer zones are preserved and ːoil remains undisturbed until construction begins. Physical markers, such as tape, signs, or barriers, indicating the imits of land disturbance, can ensure that equipment operators know the proposed limits of clearing. The area of he watershed that is exposed to construction is important for determining the net amount of erosion. Reducing the ːxtent of the disturbed area will ultimately reduce sediment loads to surface waters. Existing or newly planted ⁄egetation that has been planted to stabilize disturbed areas should be protected by routing construction traffic around ınd protecting natural vegetation with fencing, tree armoring, retaining walls, or tree wells.

■ c. *Clear only areas essential for construction.*

Ɔften areas of a construction site are unnecessarily cleared. Only those areas essential for completing construction ıctivities should be cleared, and other areas should remain undisturbed. Additionally, the proposed limits of land ıisturbance should be physically marked off to ensure that only the required land area is cleared. Avoid disturbing vegetation on steep slopes or other critical areas.

■ d. *Locate potential nonpoint pollutant sources away from steep slopes, waterbodies, and critical areas.*

Material stockpiles, borrow areas, access roads, and other land-disturbing activities can often be located away from critical areas such as steep slopes, highly erodible soils, and areas that drain directly into sensitive waterbodies.

■ e. *Route construction traffic to avoid existing or newly planted vegetation.*

Where possible, construction traffic should travel over areas that must be disturbed for other construction activity. This practice will reduce the area that is cleared and susceptible to erosion.

■ f. *Protect natural vegetation with fencing, tree armoring, and retaining walls or tree wells.*

Tree armoring protects tree trunks from being damaged by construction equipment. Fencing can also protect tree trunks, but should be placed at the tree's drip line so that construction equipment is kept away from the tree. The tree drip line is the minimum area around a tree in which the tree's root system should not be disturbed by cut, fill, or soil compaction caused by heavy equipment. When cutting or filling must be done near a tree, a retaining wall or tree well should be used to minimize the cutting of the tree's roots or the quantity of fill placed over the tree's roots.

■ g. *Stockpile topsoil and reapply to revegetate site.*

Because of the high organic content of topsoil, it cannot be used as fill material or under pavement. After a site is cleared, the topsoil is typically removed. Since topsoil is essential to establish new vegetation, it should be stockpiled and then reapplied to the site for revegetation, if appropriate. Although topsoil salvaged from the existing site can often be used, it must meet certain standards and topsoil may need to be imported onto the site if the existing topsoil is not adequate for establishing new vegetation.

h. Cover or stabilize topsoil stockpiles.

Unprotected stockpiles are very prone to erosion and therefore stockpiles must be protected. Small stockpiles can be covered with a tarp to prevent erosion. Large stockpiles should be stabilized by erosion blankets, seeding, and/or mulching.

i. Use wind erosion controls.

Wind erosion controls limit the movement of dust from disturbed soil surfaces and include many different practices. Wind barriers block air currents and are effective in controlling soil blowing. Many different materials can be used as wind barriers, including solid board fence, snow fences, and bales of hay. Sprinkling moistens the soil surface with water and must be repeated as needed to be effective for preventing wind erosion (Delaware DNREC, 1989); however, applications must be monitored to prevent excessive runoff and erosion.

j. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drain.

Earth dikes, perimeter dikes or swales, or diversions can be used to intercept and convey runoff above disturbed areas. An earth dike is a temporary berm or ridge of compacted soil that channels water to a desired location. A perimeter dike/swale or diversion is a swale with a supporting ridge on the lower side that is constructed from the soil excavated from the adjoining swale (Delaware DNREC, 1989). These practices should be used to intercept flow from denuded areas or newly seeded areas to keep the disturbed areas from being eroded from the uphill runoff. The structures should be stabilized within 14 days of installation. A pipe slope drain, also known as a pipe drop structure, is a temporary pipe placed from the top of a slope to the bottom of the slope to convey concentrated runoff down the slope without causing erosion (Delaware DNREC, 1989).

k. On long or steep, disturbed, or man-made slopes, construct benches, terraces, or ditches at regular intervals to intercept runoff.

Benches, terraces, or ditches break up a slope by providing areas of low slope in the reverse direction. This keeps water from proceeding down the slope at increasing volume and velocity. Instead, the flow is directed to a suitable outlet, such as a sediment basin or trap. The frequency of benches, terraces, or ditches will depend on the erodibility of the soils, steepness and length of the slope, and rock outcrops. This practice should be used if there is a potential for erosion along the slope.

l. Use retaining walls.

Often retaining walls can be used to decrease the steepness of a slope. If the steepness of a slope is reduced, the runoff velocity is decreased and, therefore, the erosion potential is decreased.

m. Provide linings for urban runoff conveyance channels.

Often construction increases the velocity and volume of runoff, which causes erosion in newly constructed or existing urban runoff conveyance channels. If the runoff during or after construction will cause erosion in a channel, the channel should be lined or flow control BMPs installed. The first choice of lining should be grass or sod since this reduces runoff velocities and provides water quality benefits through filtration and infiltration. If the velocity in the channel would erode the grass or sod, then riprap, concrete, or gabions can be used.

n. Use check dams.

Check dams are small, temporary dams constructed across a swale or channel. They can be constructed using gravel or straw bales. They are used to reduce the velocity of concentrated flow and, therefore, to reduce the erosion in a swale or channel. Check dams should be used when a swale or channel will be used for a short time and therefore it is not feasible or practical to line the channel or implement flow control BMPs (Delaware DNREC, 1989).

o. *Seed and fertilize.*

Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once a dense vegetative cover has been established. However, often seeding and fertilizing do not produce as thick a vegetative cover as do seed and mulch or netting. Newly established vegetation does not have as extensive a root system as existing vegetation and therefore is more prone to erosion, especially on steep slopes. Care should be taken when fertilizing to avoid untimely or excessive application. Since the practice of seeding and fertilizing does not provide any protection during the time of vegetative establishment, it should be used only on favorable soils in very flat areas and not in sensitive areas.

p. *Use seeding and mulch/mats.*

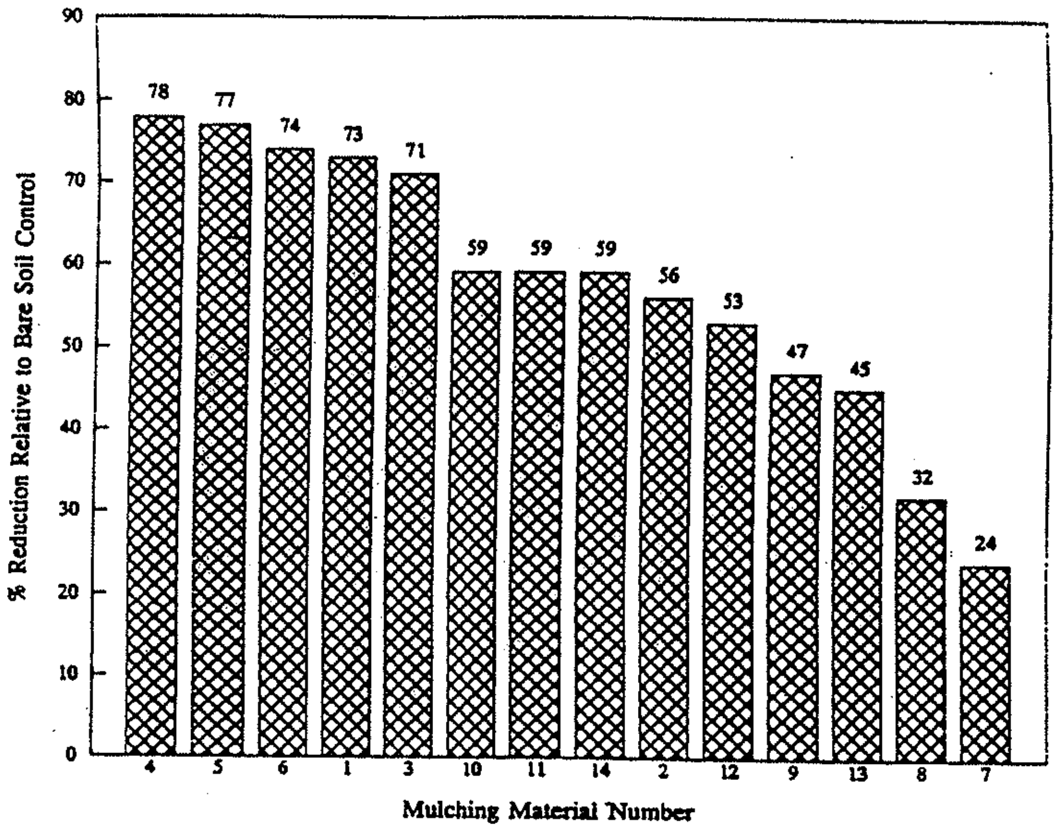
Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once the vegetative cover has been established. The mulching/mats protect the disturbed area while the vegetation becomes established.

The management of land by using ground cover reduces erosion by reducing the flow rate of runoff and the raindrop impact. Bare soils should be seeded or otherwise stabilized within 15 calendar days after final grading. Denuded areas that are inactive and will be exposed to rain for 30 days or more should also be temporarily stabilized, usually by planting seeds and establishing vegetation during favorable seasons in areas where vegetation can be established. In very flat, non-sensitive areas with favorable soils, stabilization may involve simply seeding and fertilizing. Mulching and/or sodding may be necessary as slopes become moderate to steep, as soils become more erosive, and as areas become more sensitive.

q. *Use mulch/mats.*

Mulching involves applying plant residues or other suitable materials on disturbed soil surfaces. Mulchs/mats used include tacked straw, wood chips, and jute netting and are often covered by blankets or netting. Mulching alone should be used only for temporary protection of the soil surface or when permanent seeding is not feasible. The useful life of mulch varies with the material used and the amount of precipitation, but is approximately 2 to 6 months. Figure 4-5 shows water velocity reductions that could be expected using various mulching techniques. Similarly, Figure 4-6 shows reductions in soil loss achievable using various mulching techniques. During times of year when vegetation cannot be established, soil mulching should be applied to moderate slopes and soils that are not highly erodible. On steep slopes or highly erodible soils, multiple mulching treatments should be used. On a high-elevation or desert site where grasses cannot survive the harsh environment, native shrubs may be planted. Interlocking ceramic materials, filter fabric, and netting are available for this purpose. Before stabilizing an area, it is important to have installed all sediment controls and diverted runoff away from the area to be planted. Runoff may be diverted away from denuded areas or newly planted areas using dikes, swales, or pipe slope drains to intercept runoff and convey it to a permanent channel or storm drain. Reserved topsoil may be used to revegetate a site if the stockpile has been covered and stabilized.

Consideration should be given to maintenance when designing mulching and matting schemes. Plastic nets are often used to cover the mulch or mats; however, they can foul lawn mower blades if the area requires mowing.



Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw -- 2,242 kg/ha
14	Uncrimped wheat straw -- 4,484 kg/ha

Figure 4-5. Water velocity reductions for different mulch treatments (adapted from Harding, 1990).

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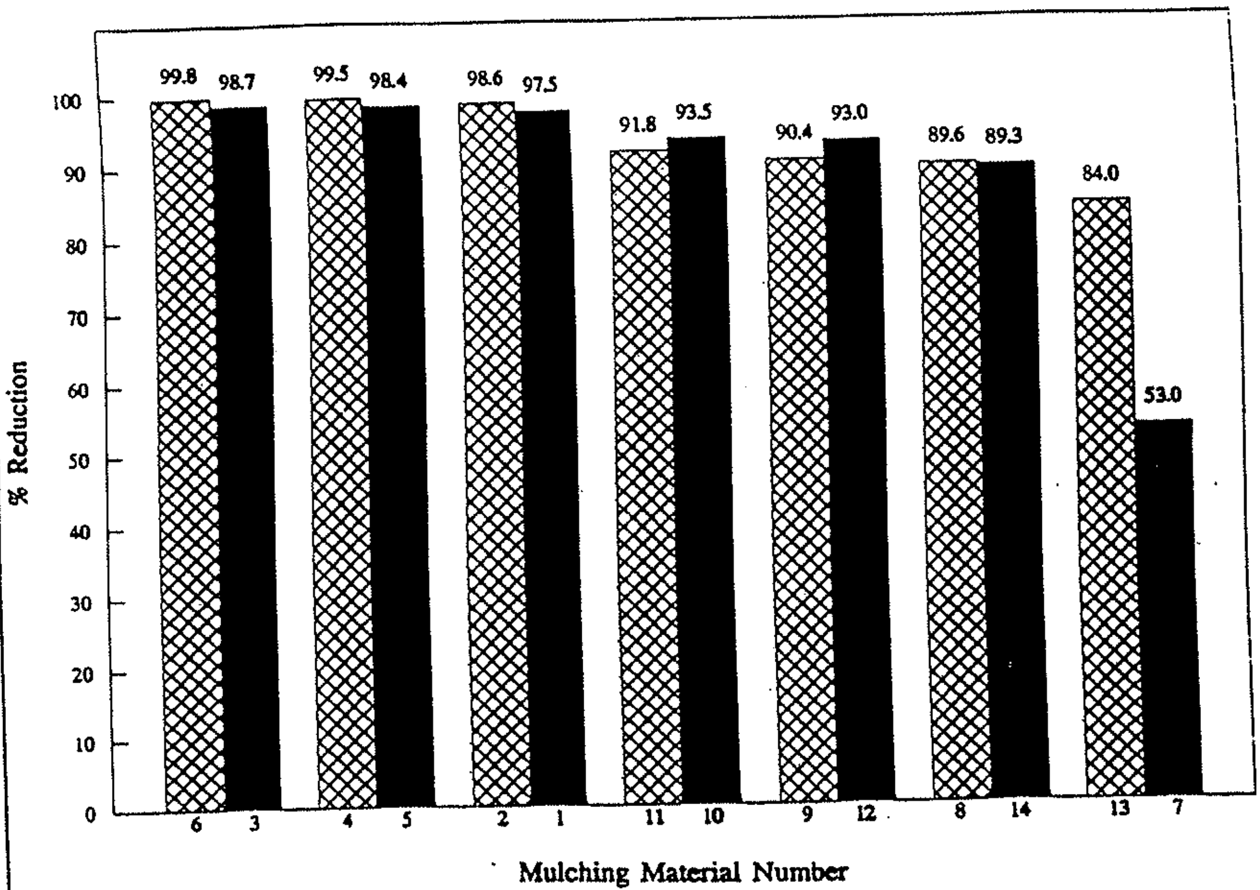

Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw – 2,242 kg/ha
14	Uncrimped wheat straw – 4,484 kg/ha

Figure 4-6. Actual soil loss reductions for different mulch treatments (adapted from Harding, 1990).

r. Use sodding.

Sodding permanently stabilizes an area. Sodding provides immediate stabilization of an area and should be used in critical areas or where establishment of permanent vegetation by seeding and mulching would be difficult. Sodding is also a preferred option when there is a high erosion potential during the period of vegetative establishment from seeding.

s. Use wildflower cover.

Because of the hardy drought-resistant nature of wildflowers, they may be more beneficial as an erosion control practice than turf grass. While not as dense as turfgrass, wildflower thatches and associated grasses are expected to be as effective in erosion control and contaminant absorption. Because thatches of wildflowers do not need fertilizers, pesticides, or herbicides, and watering is minimal, implementation of this practice may result in a cost savings (Brash et al., undated). In 1987, Howard County, Maryland, spent $690.00 per acre to maintain turfgrass areas, compared to only $31.00 per acre for wildflower meadows (Wilson, 1990).

A wildflower stand requires several years to become established; maintenance requirements are minimal once the area is established (Brash et al., undated).

5. Sediment Control Practices[4]

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Sediment controls capture sediment that is transported in runoff. Filtration and detention (gravitational settling) are the main processes used to remove sediment from urban runoff.

a. Sediment Basins

Sediment basins, also known as silt basins, are engineered impoundment structures that allow sediment to settle out of the urban runoff. They are installed prior to full-scale grading and remain in place until the disturbed portions of the drainage area are fully stabilized. They are generally located at the low point of sites, away from construction traffic, where they will be able to trap sediment-laden runoff.

Sediment basins are typically used for drainage areas between 5 and 100 acres. They can be classified as either temporary or permanent structures, depending on the length of service of the structure. If they are designed to function for less than 36 months, they are classified as "temporary"; otherwise, they are considered permanent structures. Temporary sediment basins can also be converted into permanent urban runoff management ponds. When sediment basins are designed as permanent structures, they must meet all standards for wet ponds.

b. Sediment Trap

Sediment traps are small impoundments that allow sediment to settle out of runoff water. Sediment traps are typically installed in a drainageway or other point of discharge from a disturbed area. Temporary diversions can be

[4]Adapted from Goldman (1986).

used to direct runoff to the sediment trap. Sediment traps should not be used for drainage areas greater than 5 acres and typically have a useful life of approximately 18 to 24 months.

c. Filter Fabric Fence

Filter fabric fence is available from many manufacturers and in several mesh sizes. Sediment is filtered out as urban runoff flows through the fabric. Such fences should be used only where there is sheet flow (i.e., no concentrated flow), and the maximum drainage area to the fence should be 0.5 acre or less per 100 feet of fence. Filter fabric fences have a useful life of approximately 6 to 12 months.

d. Straw Bale Barrier

A straw bale barrier is a row of anchored straw bales that detain and filter urban runoff. Straw bales are less effective than filter fabric, which can usually be used in place of straw bales. However, straw bales have been effectively used as temporary check dams in channels. As with filter fabric fences, straw bale barriers should be used only where there is sheet flow. The maximum drainage area to the barrier should be 0.25 acre or less per 100 feet of barrier. The useful life of straw bales is approximately 3 months.

e. Inlet Protection

Inlet protection consists of a barrier placed around a storm drain drop inlet, which traps sediment before it enters the storm sewer system. Filter fabric, straw bales, gravel, or sand bags are often used for inlet protection.

f. Construction Entrance

A construction entrance is a pad of gravel over filter cloth located where traffic leaves a construction site. As vehicles drive over the gravel, mud, and sediment are collected from the vehicles' wheels and offsite transport of sediment is reduced.

g. Vegetated Filter Strips

Vegetated filter strips are low-gradient vegetated areas that filter overland sheet flow. Runoff must be evenly distributed across the filter strip. Channelized flows decrease the effectiveness of filter strips. Level spreading devices are often used to distribute the runoff evenly across the strip (Dillaha et al., 1989).

Vegetated filter strips should have relatively low slopes and adequate length and should be planted with erosion-resistant plant species. The main factors that influence the removal efficiency are the vegetation type, soil infiltration rate, and flow depth and travel time. These factors are dependent on the contributing drainage area, slope of strip, degree and type of vegetative cover, and strip length. Maintenance requirements for vegetated filter strips include sediment removal and inspections to ensure that dense, vigorous vegetation is established and concentrated flows do not occur. Maintenance of these structures is discussed in Section II.A of this chapter.

6. Effectiveness and Cost Information

a. Erosion Control Practices

The effectiveness of erosion control practices can vary based on land slope, the size of the disturbed area, rainfall frequency and intensity, wind conditions, soil type, use of heavy machinery, length of time soils are exposed and unprotected, and other factors. In general, a system of erosion and sediment control practices can more effectively reduce offsite sediment transport than can a single system. Numerous nonstructural measures such as protecting natural or newly planted vegetation, minimizing the disturbance of vegetation on steep slopes and other highly erodible areas, maximizing the distance eroded material must travel before reaching the drainage system, and locating roads away from sensitive areas may be used to reduce erosion.

Table 4-15 contains the available cost and effectiveness data for some of the erosion controls listed above. Information on the effectiveness of individual nonstructural controls was not available. All reported effectiveness data assume that controls are properly designed, constructed, and maintained. Costs have been broken down into annual capital costs, annual maintenance costs, and total annual costs (including annualization of the capital costs).

b. Sediment Control Practices

Regular inspection and maintenance are needed for most erosion control practices to remain effective. The effectiveness of sediment controls will depend on the size of the construction site and the nature of the runoff flows. Sediment basins are most appropriate for drainage areas of 5 acres or greater. In smaller areas with concentrated flows, silt traps may suffice. Where concentrated flow leaves the site and the drainage area is less than 0.5 ac/100 ft of flow, filter fabric fences may be effective. In areas where sheet flow leaves the site and the drainage area is greater than 0.5 acre/100 ft of flow, perimeter dikes may be used to divert the flow to a sediment trap or sediment basin. Urban runoff inlets may be protected using straw bales or diversions to filter or route runoff away from the inlets.

Table 4-16 describes the general cost and effectiveness of some common sediment control practices.

c. Comparisons

Figure 4-7 illustrates the estimated TSS loading reductions from Maryland construction sites possible using a combination of erosion and sediment controls in contrast to using only sediment controls. Figure 4-8 shows a comparison of the cost and effectiveness of various erosion control practices. As can be seen in Figure 4-8, seeding or seeding and mulching provide the highest levels of control at the lowest cost.

Table 4-15. ESC Quantitative Effectiveness and Cost Summary

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sod	Immediate erosion protection where there is high erosion potential during vegetative establishment.	Average: 99% Observed range: 98% - 99% References: Minnesota Pollution Control Agency, 1989; Pennsylvania, 1983 cited in USEPA, 1991	2	Average: $0.2 per ft^2 [$11,300 per acre] Range: $0.1 - $1.1 References: SWRPC, 1991; Schueler, 1987; Virginia, 1980	Average: 5% Range: 5% Reference: SWRPC, 1991	$0.20 per ft^2 $7,500 per acre
Seed	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $400 per acre Range: $200 - $1000 per acre References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1980	Average: 20% Range: 15% - 25% References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991	$300 per acre
Seed and Mulch	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $1,500 per acre Range: $800 - $3,500 per acre References: Goldman, 1986; Washington DOT, 1990; NC State, 1990; Schueler, 1987; Virginia, 1980; SWRPC, 1991	Average: NA[b] Range: NA References: None	$1,100 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Mulch	Temporary stabilization of disturbed area.	Observed range: sand: (20% slope / 50% slope) wood fiber @ 1500 lb/ac: 50-60% / 0-20% wood fiber @ 3000 lb/ac: 50-85% / 50-70% straw @ 3000 lb/ac: 90-100% / 95%	Straw mulch: 0.25	Straw mulch: Average: $1,700 per acre Range: $500 - $5,000 per acre References: Wisconsin DOT cited in SWRPC, 1991; Washington DOT, 1990; Virginia, 1980	Average: NA[b] Range: NA References: None	Straw mulch: $7,500 per acre
		Silt-loam: (20% slope / 50% slope) wood fiber @ 1500 lb/ac: 20-60% / 40-60% wood fiber @ 3000 lb/ac: 60-90% / 60-70% straw @ 3000 lb/ac: 80-95% / 70-90%	Wood fiber mulch: 0.33	Wood fiber mulch: Average: $1,000 per acre Range: $100 - $2,300 per acre References: Washington DOT, 1990; Virginia, 1980		Wood fiber mulch: $3,500 per acre
		Silt-clay-loam: (10-30% slope / 30-50% slope) wood fiber @ 1500 lb/ac: 5% / -- wood fiber @ 3000 lb/ac: 40% / -- jute netting: 30-60% / 30% straw @ 3000 lb/ac: 40-70% / 20-40% wood chips @ 10,000 lb/ac: 60-80% / 50-60%	Jute netting: 0.33	Jute netting: Average: $3,700 per acre Range: $3,500-$4,100 per acre References: Washington DOT, 1990; Virginia, 1980		Jute netting: $12,500 per acre
		mulch blanket: 60-80% / 50-60% excelsior blanket: 60-80% / 50-60% multiple treatment (straw and jute): 90% / 90% References: Minnesota Pollution Control Agency, 1989; Kay, 1983 cited in Goldman, 1986	Straw and jute: 0.33	Straw and jute: Average: $5,400 per acre Range: $4,000-$9,100 per acre References: Washington DOT, 1990; Virginia, 1980		Straw and jute: $18,000 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Terraces	Break up long or steep slopes.	Observed range: Land Slope — Reduction in Erosion 1-12% — 70% 12-18% — 60% 18-24% — 55% Additionally, if the slope steepness is halved, while other factors are held constant, the soil loss potential decreases 2-1/2 times. If both the slope and length are halved, the soil loss potential is decreased 4 times. References: Goldman, 1986; Beasley, 1972	2	Average: $5 per lin ft Range: $1 - $12 References: SWRPC, 1991; Goldman, 1986; Virginia, 1991	Average: 20% Range: 20% Reference: SWRPC, 1991	$4 per lin ft
All Erosion Controls	Reduce amount of sediment entering runoff.	Average: 85% Observed range: 85% Reference: Schueler, 1990	--	Varies but typically low	Varies but typically low	Varies but typically low

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years).
[b] For Total Annual Cost, assume Annual Maintenance Cost = 2% of construction cost.

Table 4-16. ESC Quantitative Effectiveness and Cost Summary for Sediment Control Practices

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sediment basin	Minimum drainage area = 5 acres, maximum drainage area = 100 acres	Average: 70% Observed range: 55% - 100% References: Schueler, 1990; Engle, BW and Jarrett, AR, 1990; Baumann, 1990	2	Less than 50,000 ft^3 storage Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$1.30 per ft^3 Greater than 50,000 ft^3 storage Average: \$0.3 per ft^3 storage (\$550 per drainage acre[c]) Range: \$0.10 - \$0.40 per ft^3 References: SWRPC, 1991	Average: 25% Range: 25% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	Less than 50,000 ft^3 storage \$0.40 per ft^3 storage \$700 per drainage acre[b] Greater than 50,000 ft^3 storage \$0.20 per ft^3 storage \$900 per drainage acre[c]
Sediment trap	Maximum drainage area = 5 acres	Average: 60% Observed range: (-7%) - 100% References: Schueler, et al., 1990; Tahoe Regional Planning Agency, 1989; Baumann, 1990	1.5	Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$2.00 per ft^3 References: Denver COG cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986	Average: 20% Range: 20% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	\$0.70 per ft^3 storage \$1,300 per drainage acre[c]
Filter Fabric Fence	Maximum drainage area = 0.5 acre per 100 feet of fence. Not to be used in concentrated flow areas.	Average: 70% Observed range: 0% - 100% sand: 80% - 99% silt-loam: 50% - 80% silt-clay-loam: 0% - 20% References: Munson, 1991; Fisher et al., 1984; Minnesota Pollution Control Agency, 1989	0.5	Average: \$3 per lin ft (\$700 per drainage acre[c] Range: \$1 - \$8 per lin ft References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1991; NC State, 1990	Average: 100% Range: 100% References: SWRPC, 1991	\$7 per lin ft \$850 per drainage acre[c]

Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Straw Bale Barrier	Maximum drainage area = 0.25 acre per 100 feet of barrier. Not to be used in concentrated flow areas.	Average: 70% Observed Range: 70% References: Virginia, 1980 cited in EPA, 1991	0.25	Average: $4 per lin ft ($1,600 per drainage acre[d] Range: $2 - $6 per lin ft References: Goldman, 1986; Virginia, 1991	Average: 100% Range: 100% References: SWRPC, 1991	$17 per lin ft $6,800 per drainage acre[d]
Inlet Protection	Protect storm drain inlet.	Average: NA Observed Range: NA References: None	1	Average: $100 per inlet Range: $50 - $150 References: SWRPC, 1991; Denver COG cited in SWRPC, 1991; Virginia, 1991; EPA cited in SWRPC, 1991	Average: 60% Range: 20% - 100% References: SWRPC, 1991; Denver COG cited in SWRPC, 1991	$150 per inlet
Construction Entrance	Removes sediment from vehicles wheels.	Average: NA Observed Range: NA References: None	2	Average: $2,000 each Range: $1,000 - $4,000 References: Goldman, 1986; NC State, 1990	Average: NA[e] Range: NA References: None	$1,500 each
				With washrack: Average: $3,000 each Range: $1,000 - $5,000 References: Virginia, 1991		$2,200 each

Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Vegetative Filter Strip	Must have sheet flow.	Average: 70% Observed Range: 20% - 80% References: Hayes and Hairston, 1983 cited in Casman, 1990; Dillaha et al., 1989, cited in Glick et al., 1991; Virginia Department of Conservation, 1987; Nonpoint Source Control Task Force, 1983 cited in Minnesota PCA, 1989; Schueler, 1987	2	Established from existing vegetation- Average: $0 Range: $0 References: Schueler, 1987 Established from sod- Average: $11,300 per acre Range: $4,500 - $48,000 per acre References: Schueler, 1987; SWRPC, 1991	Average: NA Range: NA References: None	NA

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years)
[e] For Total Annual Cost, assume Annual Maintenance Cost=20% of construction cost.
[b] Assumes trap volume = 1800 cf/ac (0.5 inches runoff per acre).
[c] Assumes drainage area of 0.5 acre per 100 feet of fence (maximum allowed).
[d] Assumes drainage area of 0.25 acre per 100 feet of barrier (maximum allowed).

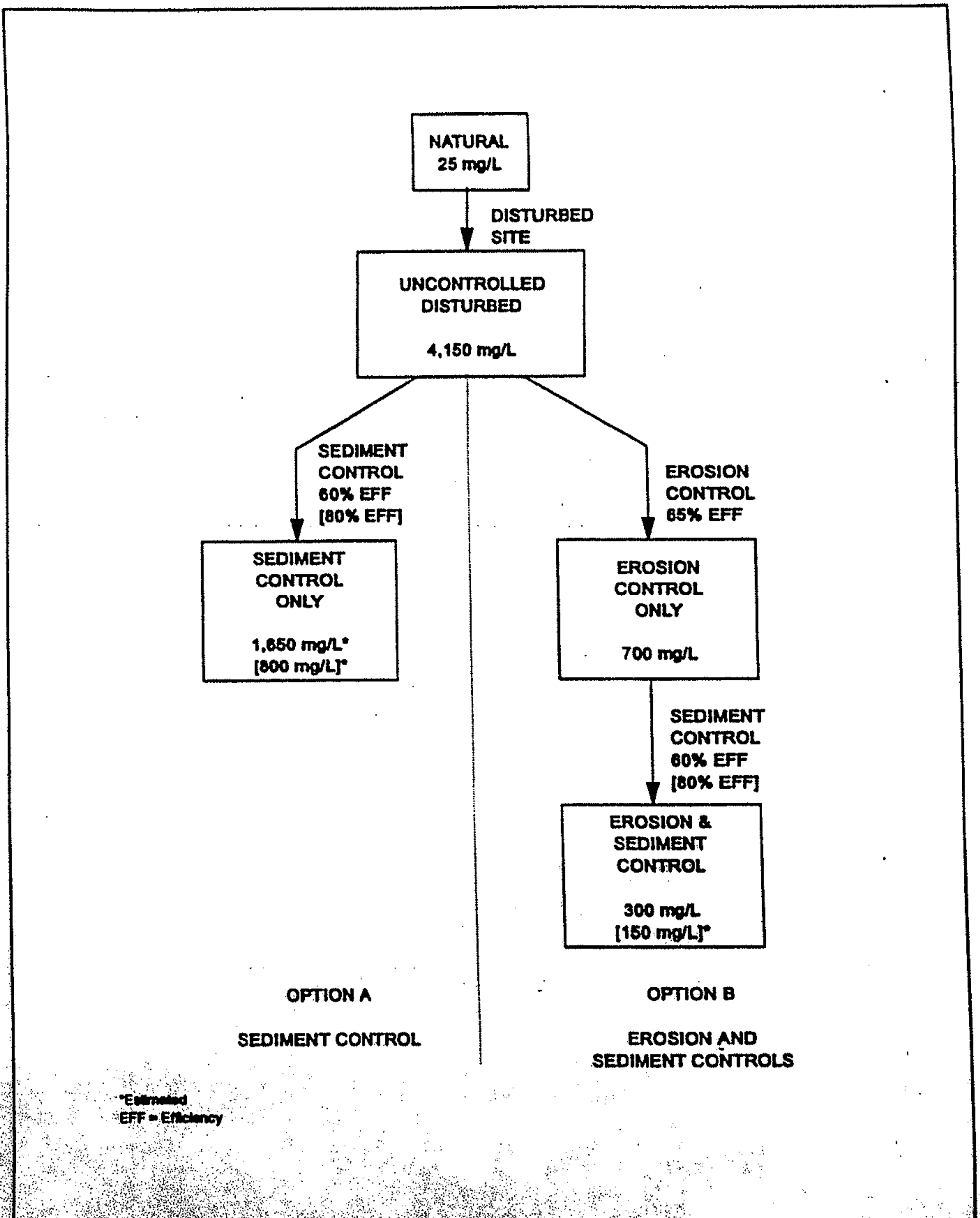

Figure 4-7. TSS concentrations from Maryland construction sites (Schueler, 1987).

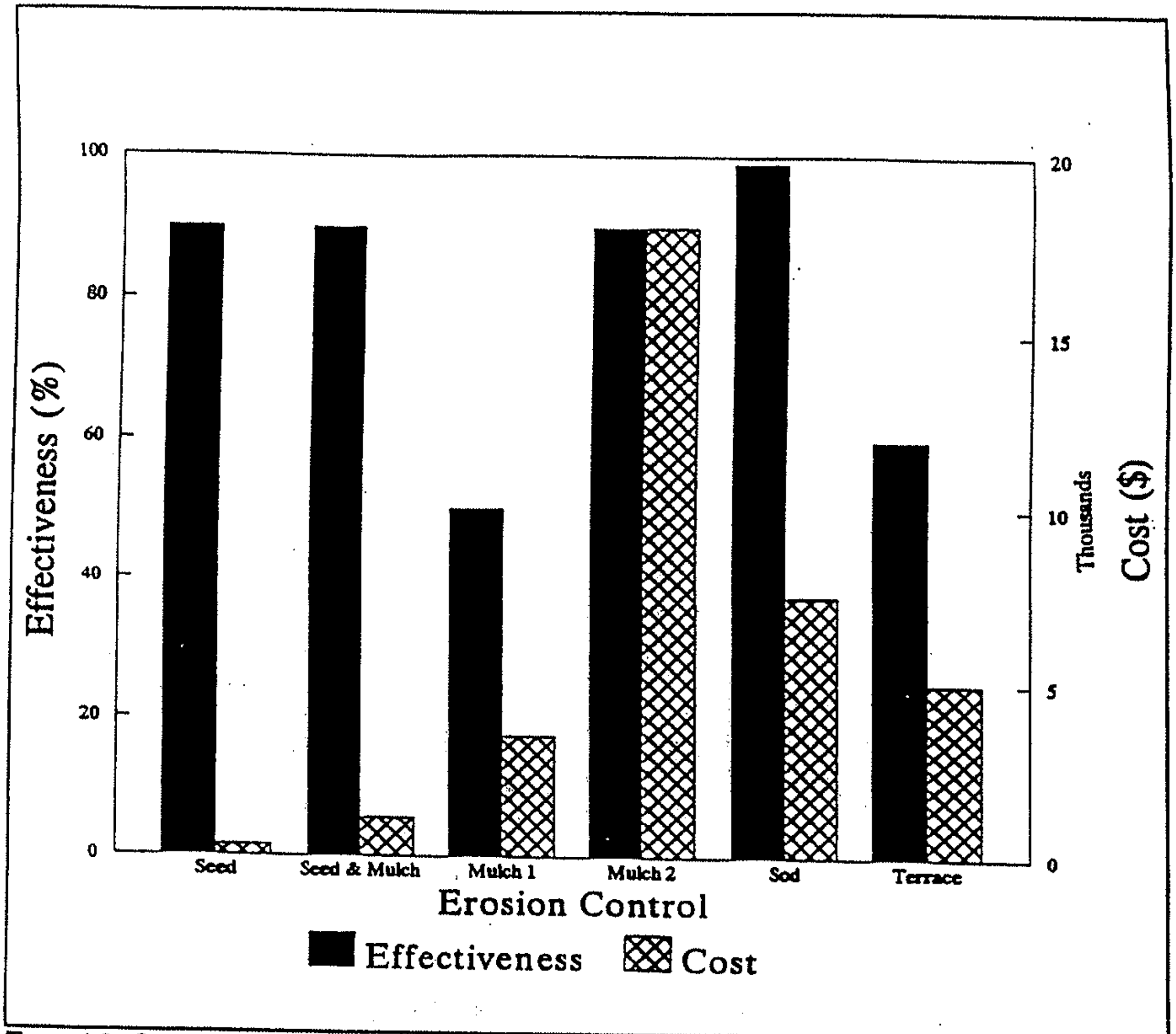

Figure 4-8. Comparison of cost and effectiveness for erosion control practices (based on information in Tables 4-15 and 4-16).

B. Construction Site Chemical Control Management Measure

(1) Limit application, generation, and migration of toxic substances;

(2) Ensure the proper storage and disposal of toxic materials; and

(3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

1. Applicability

This management measure is intended to be applied by States to all construction sites less than 5 acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformance with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The purpose of this management measure is to prevent the generation of nonpoint source pollution from construction sites due to improper handling and usage of nutrients and toxic substances, and to prevent the movement of toxic substances from the construction site.

Many potential pollutants other than sediment are associated with construction activities. These pollutants include pesticides (insecticides, fungicides, herbicides, and rodenticides); fertilizers used for vegetative stabilization; petrochemicals (oils, gasoline, and asphalt degreasers); construction chemicals such as concrete products, sealers, and paints; wash water associated with these products; paper; wood; garbage; and sanitary wastes (Washington State Department of Ecology, 1991).

The variety of pollutants present and the severity of their effects are dependent on a number of factors:

(1) **The nature of the construction activity.** For example, potential pollution associated with fertilizer usage may be greater along a highway or at a housing development than it would be at a shopping center development because highways and housing developments usually have greater landscaping requirements.

(2) **The physical characteristics of the construction site.** The majority of all pollutants generated at construction sites are carried to surface waters via runoff. Therefore, the factors affecting runoff volume,

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such as the amount, intensity, and frequency of rainfall; soil infiltration rates; surface roughness; slope length and steepness; and area denuded, all contribute to pollutant loadings.

(3) **The proximity of surface waters to the nonpoint pollutant source.** As the distance separating pollutant-generating activities from surface waters decreases, the likelihood of water quality impacts increases.

a. Pesticides

Insecticides, rodenticides, and herbicides are used on construction sites to provide safe and healthy conditions, reduce maintenance and fire hazards, and curb weeds and woody plants. Rodenticides are also used to control rodents attracted to construction sites. Common insecticides employed include synthetic, relatively water-insoluble chlorinated hydrocarbons, organophosphates, carbamates, and pyrethrins.

b. Petroleum Products

Petroleum products used during construction include fuels and lubricants for vehicles, for power tools, and for general equipment maintenance. Specific petroleum pollutants include gasoline, diesel oil, kerosene, lubricating oils, and grease. Asphalt paving also can be particularly harmful since it releases various oils for a considerable time period after application. Asphalt overloads might be dumped and covered without inspection. However, many of these pollutants adhere to soil particles and other surfaces and can therefore be more easily controlled.

c. Nutrients

Fertilizers are used on construction sites when revegetating graded or disturbed areas. Fertilizers contain nitrogen and phosphorus, which in large doses can adversely affect surface waters, causing eutrophication.

d. Solid Wastes

Solid wastes on construction sites are generated from trees and shrubs removed during land clearing and structure installation. Other wastes include wood and paper from packaging and building materials, scrap metals, sanitary wastes, rubber, plastic and glass, and masonry and asphalt products. Food containers, cigarette packages, leftover food, and aluminum foil also contribute solid wastes to the construction site.

e. Construction Chemicals

Chemical pollutants, such as paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, soil additives used for stabilization, and concrete-curing compounds, may also be used on construction sites and carried in runoff.

f. Other Pollutants

Other pollutants, such as wash water from concrete mixers, acid and alkaline solutions from exposed soil or rock, and alkaline-forming natural elements, may also be present and contribute to nonpoint source pollution.

Revegetation of disturbed areas may require the use of fertilizers and pesticides, which, if not applied properly, may become nonpoint source pollutants. Many pesticides are restricted by Federal and/or State regulations.

Hydroseeding operations, in which seed, fertilizers, and lime are applied to the ground surface in a one-step operation, are more conducive to nutrient pollution than are the conventional seedbed-preparation operations, in which fertilizers and lime are tilled into the soil. Use of fertilizers containing little or no phosphorus may be required by local authorities if the development is near sensitive waterbodies. The addition of lime can also affect the pH of sensitive waters, making them more alkaline.

Improper fueling and servicing of vehicles can lead to significant quantities of petroleum products being dumped onto the ground. These pollutants can then be washed off site in urban runoff, even when proper erosion and sediment controls are in place. Pollutants carried in solution in runoff water, or fixed with sediment crystalline structures, may not be adequately controlled by erosion and sediment control practices (Washington Department of Ecology, 1991). Oils, waxes, and water-insoluble pesticides can form surface films on water and solid particles. Oil films can also concentrate water-soluble insecticides. These pollutants can be nearly impossible to control once present in runoff other than by the use of very costly water-treatment facilities (Washington Department of Ecology, 1991).

After spill prevention, one of the best methods to control petroleum pollutants is to retain sediments containing oil on the construction site through use of erosion and sediment control practices. Improved maintenance and safe storage facilities will reduce the chance of contaminating a construction site. One of the greatest concerns related to use of petroleum products is the method for waste disposal. The dumping of petroleum product wastes into sewers and other drainage channels is illegal and could result in fines or job shutdown.

The primary control method for solid wastes is to provide adequate disposal facilities. Erosion and sediment control structures usually capture much of the solid waste from construction sites. Periodic removal of litter from these structures will reduce solid waste accumulations. Collected solid waste should be removed and disposed of at authorized disposal areas.

Improperly stored construction materials, such as pressure-treated lumber or solvents, may lead to leaching of toxics to surface water and ground water. Disposal of construction chemicals should follow all applicable State and local laws that may require disposal by a licensed waste management firm.

3. Management Measure Selection

This management measure was selected based on the potential for many construction activities to contribute to nutrient and toxic NPS pollution.

This management measure was selected because (1) construction activities have the potential to contribute to increased loadings of toxic substances and nutrients to waterbodies; (2) various States and local governments regulate the control of chemicals on construction sites through spill prevention plans, erosion and sediment control plans, or other administrative devices; (3) the practices described are commonly used and presented in a number of best management practice handbooks and guidance manuals for construction sites; and (4) the practices selected are the most economical and effective.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

■ a. *Properly store, handle, apply, and dispose of pesticides.*

Pesticide storage areas on construction sites should be protected from the elements. Warning signs should be placed in areas recently sprayed or treated. Persons mixing and applying these chemicals should wear suitable protective clothing, in accordance with the law.

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Application rates should conform to registered label directions. Disposal of excess pesticides and pesticide-related wastes should conform to registered label directions for the disposal and storage of pesticides and pesticide containers set forth in applicable Federal, State, and local regulations that govern their usage, handling, storage, and disposal. Pesticides and herbicides should be used only in conjunction with Integrated Pest Management (IPM) (see Chapter 2). Pesticides should be the tool of last resort; methods that are the least disruptive to the environment and human health should be used first.

Pesticides should be disposed of through either a licensed waste management firm or a treatment, storage, and disposal (TSD) facility. Containers should be triple-rinsed before disposal, and rinse waters should be reused as product.

Other practices include setting aside a locked storage area, tightly closing lids, storing in a cool, dry place, checking containers periodically for leaks or deterioration, maintaining a list of products in storage, using plastic sheeting to line the storage area, and notifying neighboring property owners prior to spraying.

b. Properly store, handle, use, and dispose of petroleum products.

When storing petroleum products, follow these guidelines:

- Create a shelter around the area with cover and wind protection;
- Line the storage area with a double layer of plastic sheeting or similar material;
- Create an impervious berm around the perimeter with a capacity 110 percent greater than that of the largest container;
- Clearly label all products;
- Keep tanks off the ground; and
- Keep lids securely fastened.

Oil and oily wastes such as crankcase oil, cans, rags, and paper dropped into oils and lubricants should be disposed of in proper receptacles or recycled. Waste oil for recycling should not be mixed with degreasers, solvents, antifreeze, or brake fluid.

c. Establish fuel and vehicle maintenance staging areas located away from all drainage courses, and design these areas to control runoff.

Proper maintenance of equipment and installation of proper stream crossings will further reduce pollution of water by these sources. Stream crossings should be minimized through proper planning of access roads. Refer to Chapter 3 for additional information on stream crossings.

d. Provide sanitary facilities for constructions workers.

e. Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff of pollutants and contamination of ground water.

f. Develop and implement a spill prevention and control plan. Agencies, contractors, and other commercial entities that store, handle, or transport fuel, oil, or hazardous materials should develop a spill response plan.

Post spill procedure information and have persons trained in spill handling on site or on call at all times. Materials for cleaning up spills should be kept on site and easily available. Spills should be cleaned up immediately and the contaminated material properly disposed of. Spill control plan components should include:

- Stop the source of the spill.
- Contain any liquid.
- Cover the spill with absorbent material such as kitty litter or sawdust, but do not use straw. Dispose of the used absorbent properly.

g. Maintain and wash equipment and machinery in confined areas specifically designed to control runoff.

Thinners or solvents should not be discharged into sanitary or storm sewer systems when cleaning machinery. Use alternative methods for cleaning larger equipment parts, such as high-pressure, high-temperature water washes, or steam cleaning. Equipment-washing detergents can be used, and wash water may be discharged into sanitary sewers if solids are removed from the solution first. (This practice should be verified with the local sewer authority.) Small parts can be cleaned with degreasing solvents, which can then be reused or recycled. Do not discharge any solvents into sewers.

Washout from concrete trucks should be disposed of into:

- A designated area that will later be backfilled;
- An area where the concrete wash can harden, can be broken up, and then can be placed in a dumpster; or
- A location not subject to urban runoff and more than 50 feet away from a storm drain, open ditch, or surface water.

Never dump washout into a sanitary sewer or storm drain, or onto soil or pavement that carries urban runoff.

h. Develop and implement nutrient management plans.

Properly time applications, and work fertilizers and liming materials into the soil to depths of 4 to 6 inches. Using soil tests to determine specific nutrient needs at the site can greatly decrease the amount of nutrients applied.

i. Provide adequate disposal facilities for solid waste, including excess asphalt, produced during construction.

j. Educate construction workers about proper materials handling and spill response procedures. Distribute or post informational material regarding chemical control.

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN KAWAHARA

MARK ALEXANDER ROY

December 14, 2007

Jeffrey Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Environmental Impact Statement Preparation Notice for the Lahaina Small Boat Harbor Ferry Pier Improvements

Dear Mr. Eng:

Thank you for your department's letter of February 14, 2005, providing comments on the Environmental Impact Statement (EIS) Preparation Notice for the proposed Lahaina Small Boat Harbor (LSBH) Ferry Pier Improvements, in Lahaina, Maui, TMK (2) 4-6-001:002. In response to the comments, we note the following:

1. The proposed project will not result in any substantial increase in water demand at the LSBH and no new or larger water meters will be required. Only two (2) hose bibs will be added to new pier.

2. The EIS will discuss anticipated potable and non-potable water uses for the new ferry pier.

3. The applicant, the Department of Land and Natural Resources (DLNR), will submit domestic and fire flow calculations during the building permit process.

4. The DLNR will determine the presence of reduced pressure back-flow prevention and acknowledges that such will be required if it does not already exist.

5. The DLNR will consider the use of brackish or reclaimed water for non-potable uses to the extent practicable.

6. The DLNR will implement Best Management Practices (BMPs) to the fullest extent practicable during construction-related activities.

305 High Street, Suite 104 · Wailuku, Hawaii 96793 · ph: (808)244-2015 · fax: (808)244-8729 · planning@mhinconline.com

environment
planning
government

Thank you again for providing your input to the proposed action. A copy of the Draft EIS will be provided to you for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:tn
cc: Eric Hirano, Department of Land and Natural Resources
F:\DATA\MAI\LhnPier\DEIS\dws.res.wpd

14. LIST OF ENVIRONMENTAL IMPACTS STATEMENT PREPARERS

14. LIST OF ENVIRONMENTAL IMPACTS STATEMENT PREPARERS

	Name of Firm	Area of Responsibility
1.	Mitsunaga & Associates, Inc. 747 Amana Street, Suite 216 Honolulu, Hawai`i 96814	Architectural Basis of Design Preliminary Engineering Report
2.	Munekiyo & Hiraga, Inc. 305 High Street, Suite 104 Wailuku, Hawai`i 96793	Environmental Impact Statement
3.	EKNA Services, Inc. 615 Piikoi Street, Suite 300 Honolulu, Hawai`i 96814	Oceanographic Design and Coastal Engineering
4.	AECOS, Inc. 45-939 Kamehameha Highway, Rm 104 Kane`ohe, Hawai`i 96744	Marine Biology and Water Quality
5.	Pacific Legacy, Inc. 332 Uluniu Street Kailua, Hawai`i 96734	Archaeological Inventory Survey and Cultural Impact Assessment
6.	Wilson Okamoto Corporation 1907 South Beretania Street Honolulu, Hawai`i 96826	Traffic Impact Assessment Report
7.	U.S. Department of Interior U.S. Fish and Wildlife Service Pacific Region Honolulu, Hawai`i	Marine Biological Assessment of Alternative Sites and Habitat Equivalency Analysis
8.	Iwado Court Reporters, Inc. 2233 Vineyard Street Wailuku, Hawai`i 96793	Stakeholder Meeting Minutes

15. REFERENCES

15. REFERENCES

County of Maui, General Plan of the County of Maui, 1990 Update.

County of Maui, Maui County Data Book 2005, June 2005.

County of Maui, West Maui Community Plan, February 1996.

Department of the Army, Draft Environmental Statement - Lahaina Small Boat Harbor, July 1976.

Federal Emergency Management Agency, Flood Insurance Rate Map Community/Panel No. 150003/0163C, August 3, 1998.

Hardin, M.J. with Elgledow, Jill, Maui Magic The Best Island, Aka Press 1988.

Kupau, Summer, Exploring Historic Lahaina, Watermark Publishing 2001.

Maui County Planning Department, Socio-Economic Forecast, The Economic Projections for the Maui County General Plan 2030, June 2006.

Munekiyo, Arakawa & Hiraga, Inc., Final Environmental Assessment - Westside Resource Center, December 2000.

Munekiyo & Hiraga, Inc., Lahaina Small Boat Harbor Comfort Station Improvements Environmental Funding/Details/Justification Information to Support a Categorical Exclusion Under 23 CFR 771.11(c)(12) and 23 CFR 771.177(d)(10), February 2005.

Munekiyo & Hiraga, Inc., Final Environmental Assessment-Lahaina Small Boat Harbor Comfort Station Improvements, January 2005.

Munekiyo & Hiraga, Inc., Final Environmental Assessment - Proposed Front Street Commercial Building, October 2002.

Munekiyo & Hiraga, Inc., Site Location and Design Alternatives, Proposed Interisland Ferry Pier Improvements at West Maui, Hawai`i, August 2005.

R.M. Towill Corporation, Public Facility Assessment Update County of Maui, Maui County Planning Department, July 2002.

Rosendahl, Paul H., Archaeological Inventory Survey, Lahaina Bypass Highway New Connector Roads Project Area, January, 1994.

SMS, Maui County Community Plan Update Program: Socio-Economic Forecast Phase I Report (Final Version), June 14, 2002.

Sea Engineering and AECOS, Inc., Coastal Engineering and Marine Environment Investigations for Drainline "F" Improvements, Lahaina, Maui, 1994.

State of Hawai`i, Department of Health, Clean Air Branch, 2007 Air Monitoring Network Plan, May 2007.

University of Hawai`i, Department of Geography, Atlas of Hawai`i, Third Edition, 1998.

U.S. Army Engineer District, Honolulu, Draft Supplement II, Environmental Impact Statement for Ma`alaea Harbor for Light Draft Vessels, Maui, Hawai`i, May 1998.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kaua`i, O`ahu, Maui, Moloka`i and Lana`i, State of Hawai`i, 1972.

Wilson Okamoto & Associates, Inc., County of Maui Infrastructure Assessment Update, May 2003.

Xamanek Researches, Inc., An Archaeological Inventory Survey of the West Side Resources Center (Ka Hale A Ke Ola), Lands of Ko'oka, Waine'e, Pua'a nui, Lahaina District, Maui Islands (TMK 4-6-15: por. 1), November, 2000.

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APPENDIX A.

Basis of Design, Lahaina Small Boat Harbor New Ferry Pier, Lahaina, Maui, Hawai`i, May 2006

Basis of Design

LAHAINA SMALL BOAT HARBOR
NEW FERRY PIER
LAHAINA, MAUI, HAWAI'I
(TMK: 4-6-01:02, 4-6-01:17, 4-6-01:14)

MAY 2006

PREPARED FOR:

State of Hawaii
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street, Rm. 221
Honolulu, Hawaii 96810

PREPARED BY:

Mitsunaga and Associates, Inc.
747 Amana Street Suite 216
Honolulu, Hawaii 96814
Phone: (808) 945-7882 Fax: (808) 946-2563
Email: Mitsunaga-civil@hawaii.rr.com

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LAHAINA SMALL BOAT HARBOR
FERRY PIER IMPROVEMENTS
Lahaina, Maui, Hawaii
(TMK: 4-6-01:02, 4-6-01:17, 4-6-01:14)

BASIS OF DESIGN
CIVIL ENGINEERING

1.0 SITE ACCESSIBILITY AND PARKING

1.1 Existing Conditions

The existing Lahaina Small Boat Harbor pier is approximately 120 feet long and 66 feet wide. The pier contains the harbor masters office, ferry ticket booths, a fish hoist, diesel fuel dispensing station and wastewater pump out station. When cruise ships are moored off Lahaina the boat harbor becomes one of the busiest in the state.

The existing drop off area/loading zone fronting the pier has four parking stalls, three for drop off/ loading and one reserved stall. There are also two accessible parking stalls in front of the historic Light House. The drop off/loading stalls are regularly double or triple parked (See attached photos). Removable bollards are put up when cruise ships are in town to provide a passenger staging and security screening area. The bollards block of the drop off/loading stalls and create a 50 ft by 50 ft buffer area fronting the pier.

1.2 Proposed Improvements

The proposed Ferry Pier Improvements are located within the Lahaina Small Boat Harbor and on the adjacent Wharf Street (part State and part County) fronting the existing pier in the Town of Lahaina, on the Island of Maui. The project area is approximately 0.7 acre and owned and maintained by the State of Hawaii. Improvements to the drop off/loading zones may require work to be done on the adjacent streets including Wharf Street (part State and part County) and Papelekane Street (State) and Hotel Street (County).

The improvements to the proposed Ferry Pier drop off area will provide additional parking stalls and loading/unloading zones. New medians and removable bollards will provide a temporary buffer zone to the new ferry pier and existing pier when required. The buffer zone may also be used for passenger staging and security screening when cruise ships are moored off Lahaina.

Additional Parking will be provided in accordance with the County of Maui. Roadway Design criteria will adhere to the *Hawaii Statewide Uniform Design Manual For Streets and Highways*, DOT Highways Division & DPW Counties of the State of Hawaii, October 1980. Traffic control plans and/or phasing plans will be provided to maintain

harbor operations including safe vehicular and pedestrian circulation within the project site.

The project will comply with Americans with Disabilities (ADA) Guidelines. Final plans will be submitted to the Disability and Communication Access Board (DCAB) for ADA review and compliance.

2.0 GRADING AND DRAINAGE

2.1 Existing Conditions

The project site is relatively flat with elevations mainly between 7 to 9 feet above sea level. The existing pier is at approximately 7 feet above sea level.

The existing site runoff sheet flows from the northwest into the ocean.

2.2 Proposed Improvements

The grading of the 0.7 acre site will comply with the Maui County Grading Ordinance and the recommendations of the geotechnical engineer. On-site fill meeting the specification requirements will be utilized within the project limits, as directed by the Engineer. Site grading will have slopes of 3:1 or flatter.

There is no existing drainage system located on the project site, existing drainage patterns will be maintained. Drainage facilities will be added in accordance Maui County Standards as required.

Erosion and dust control measures will be implemented to accommodate adjacent facilities.

3.0 WATER SYSTEM

3.1 Existing Conditions

DOMESTIC WATER

An existing 3" water line services the Harbor Masters Office, hose bibs and fire cabinets on the existing pier.

FIRE PROTECTION

There are three fire cabinets containing a 100 gallon water bladder tank and a 100 foot fire hose on the existing pier. The three cabinets seem to provide redundant coverage for the pier as they are all relatively close together. There are two fire hydrants near the existing pier. One hydrant is located approximately 110 feet to the north of the existing pier. The second hydrant is located approximately 40 feet west of the existing pier.

3.2 Proposed Improvements

DOMESTIC WATER

Two hose bibs will be provided on the proposed ferry pier. A new three-inch water line will connect to the water line on the existing pier and be routed under the proposed gangway and ferry pier to supply the new hose bibs and fire system.

FIRE PROTECTION

There are three fire cabinets containing a 100 gallon water storage tank and a 100 foot fire hose on the existing pier. One of the existing three fire cabinets will be relocated to the new ferry pier to provide fire protection to the ferry pier. Fire hydrants on the landside will be relocated to accommodate new parking and loading zone areas.

WATER SUPPLY REQUIREMENTS:
(Reference: Water System Standards, Department of Water Supply, 2002)

Fire flow: 2000 gpm, 2 hrs, 250' spacing of fire hydrants. (Table 100-19)

4.0 <u>WASTEWATER SYSTEM</u>

4.1 Existing Conditions

The wastewater system for the harbor masters office and vessel pump out station are served by an existing three-inch force main. There is an existing pump station located adjacent to the harbor masters office. The wastewater is pumped to a County gravity sewer located near the intersection of Hotel and Wharf Streets. The County system in Lahaina is pumped through a series of force mains and gravity lines to Lahaina Wastewater Reclamation Facility (LWRF) just beyond Kaanapali Resort.

4.2 Proposed Improvements

The proposed Ferry Pier will include two vessel wastewater pump out stations to provide vessels with a disposal facility for their wastewater. The vessel pump out stations may be furnished with an Edson 284EB-40 diaphragm pump (See Attached Catalog Sheet) or approved equal. This is a marine bronze pump that will suction out at 30 gallons per minute. Wastewater from the vessel pump station will be conveyed into a grinder pump station on the proposed ferry pier. An ABS duplex sewage grinder pump station, or approved equal, will included two 3.5 horse power wastewater pumps (See Attached Catalog Sheet) providing the required lift and flow velocity needed to pump the

wastewater from the pier to the existing manhole. The wastewater will be pumped in a new three-inch force main under the proposed pier and gangway, to the existing three-inch force main on the existing pier. In order to utilize the existing force main, check valves will be provided on the new and existing force mains to mitigate backflow within the system. A high water alarm should be installed on the existing pump station, if it does not already exist, adjacent to the Harbor Master's Office to ensure that the existing system does not overflow when the new system is pumping. The existing three inch force main connects to the Counties gravity sewer system on Hotel Street.

PUMP SYSTEM

EXISTING PUMP STATION (Assumed)

Existing 3-inch Force Main
For V_{ave} = 5 f/s (feet per second)
$Q = AV = (p/4)*(3/12)*5 = 0.245\ ft^3/sec$
$\longrightarrow$ $(0.245\ ft^3/sec)*(7.43\ gal/1\ ft^3)*(60\ sec/1\ min) = 110\ gal/min$

Q = 110 gpm (gallons per minute)

Pump model unknown

PROPOSED PUMP STATION

Assumptions
1. 3-inch Force Main
2. Flow = 110 GPM = 6,600 Gallons Per Hour

Volumetric Flow Rate = $V = (6{,}600\ GPH)*(0.1337 ft^3) = 882.4\ ft^3/hr$

Velocity in the pipe = $v = V/A = (882.4\ ft^3/hr)*(1hr/3600\ sec) / 0.0491\ ft^2 =$ <u>4.99 ft/sec</u>

Total Head $= h_a = h_f + h_z$
$h_z = 5$ ft
$h_f = fLV^2/2Dg$

f = (friction factor) = (0.009) (L.F Moody – "Friction Factor from Pipe Flow")

$L_t = L +$ Sum of L_e (Equivalent lengths for head loss in fittings from Table 17.D CERM)
= 310 ft + (11+11+4)
= 336 ft

$h_f = (0.009)*(336\ ft)*(4.99\ ft/sec)^2 / (2)*(0.25\ ft)*(32.2\ ft/sec^2) = 4.68$ ft

$h_a = h_f + h_z = 4.68\text{ ft} + 5\text{ ft} = 9.68\text{ ft} = \underline{10\text{ ft}}$ (round up)

Hydraulic Horse Power

$WHP = h_a Q(SG)/3956$

$= 10\text{ ft }(6{,}600\text{ gal/hr})*(1/60\text{min})(1) / 3956\text{ ft-gal/hp-min}$

$= 2.78\text{ hp say }\underline{3.5\text{ hp}}$

Therefore, based on preliminary pump system requirements, the new lift station at the proposed ferry pier will need to provide 110 gpm at 10 feet of total dynamic head.

APPENDIX A
Photographs

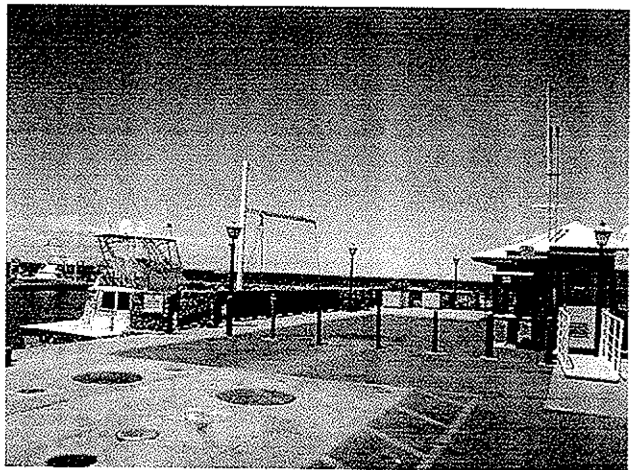


Photo 1 – Existing Ferry Pier

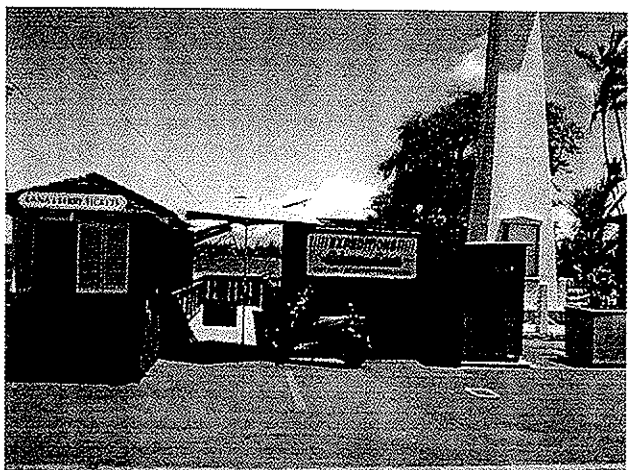


Photo 2 – Street Entrance to "Carthinaginian II" Dock

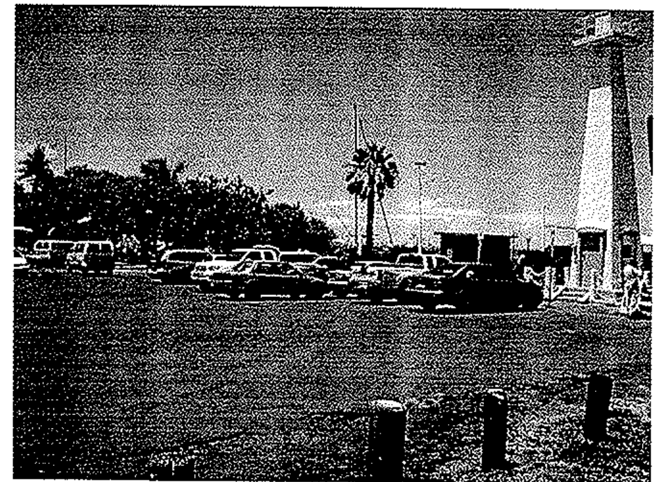


Photo 3 – Existing Pier Drop Off 1

Photo 4 – Existing Pier Drop Off 2

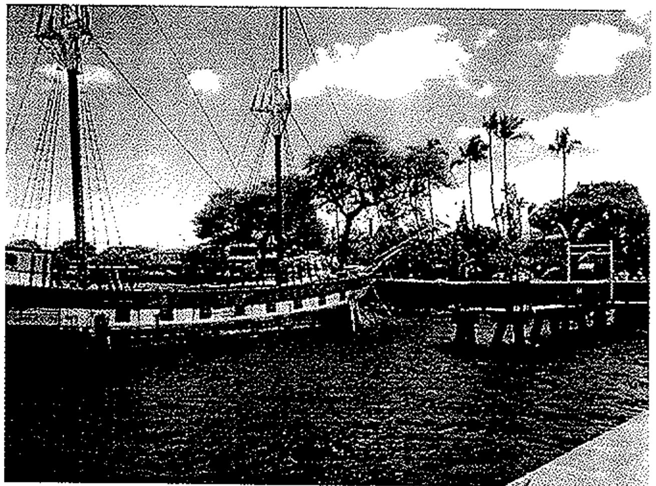


Photo 5 – Proposed Location of New Pier

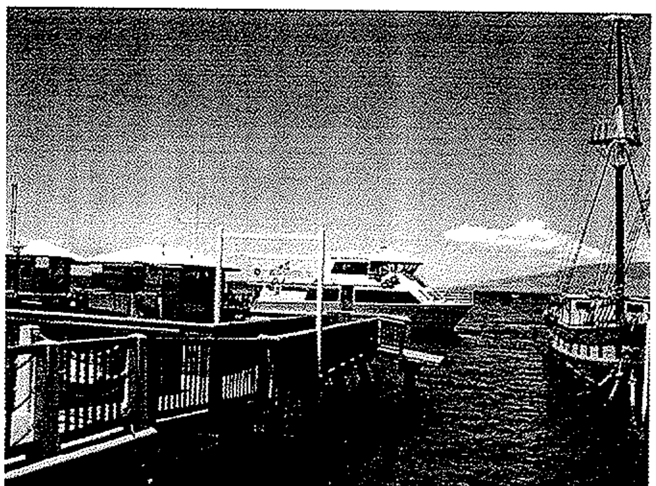


Photo 6 – Lanai Ferry at Existing Pier

APPENDIX B
Diaphragm Pump System

Edson DIAPHRAGM PUMP OUT SYSTEM

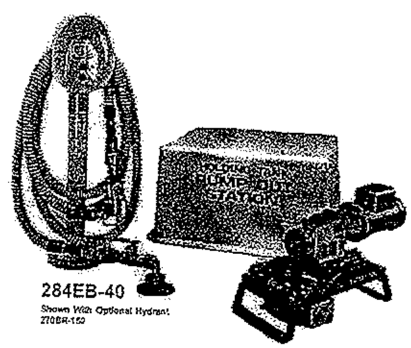
Complete Pumping Station For Marina Pump Out

Performance Features
- No Clog, No Spill, No Smell
- Dry Start Suction Lift to 12ft (3.65m)
- Discharge Head 15ft (4.57m)
- Pump Rated to 38 GPM (144LPM)
- Dependable Performance
- Automatic Self Priming Starts
- 24V Push Button Start/Stop with Shut Off Timer

Design Features
- Easy to Use-Low Maintenance Components
- Modular For Flexibility of Installation
- Pump - Bronze, 2" Diaphragm
- Pump Cover - Heavy Duty UV Protected Fiberglass
- Hose Stand - White Powder Coated Aluminum
- Start/Stop Controls - On Hose Stand for Easy Access
- Motor - 3/4 HP, 1Ph, 115/230V for Convenient Installation
- Optional Motors & Controls For Any Requirements

For Marine, Campground and Industrial Applications. Edson's engineers have combined Edson Single Diaphragm Pump with the hose, fittings and accessories required to provide a trouble-free and efficient Sewage Collection System. The Edson Diaphragm Pump Out will also provide industrial and commercial operations with an environmentally sound method of sewage, oil, and waste liquid collection.

At the "Heart" of the pump out is Edson's powerful diaphragm pump. It is the best choice for the transfer and collection of sewage, sludge, waste oil and high viscosity fluids with suspended solids under low head conditions. Straight-through passages with no impellers insure Edson Pumps will not be stopped or damaged by personal hygiene items, bottle caps, paper, stones, twigs, banana peels, or any materials encountered when collecting waste products.



284EB-40
Shown With Optional Hydrant 270BR-150

Edson Diaphragm Pump Out Systems

PUMP PERFORMANCE: Max. Volume - 38GPM / 144 LPM ● Suction Lift - to 15 ft / 4.57m ● Disharge Head - to 15 ft / 4.57m ● Dry Suction Lift - 12 ft / 3.65m.

PUMP CONSTRUCTION: Marine Bronze Pump Body ● Nitrile Diaphragm and Valves ● Stainless Steel Hardware ● Aluminum Frame ● Inlet - 2" Male NPT ● Discharge - 2" Female NPT ● Standard Electric - 3/4 HP, Single Phase, 110/220 Volt, 60 HZ, 55 RPM, TEFC Gearmotor with a Control Panel with Timer and 24 Volt Remote Stop/Start.

ENCLOSURE CONSTRUCTION: Molded Solid Fiberglass 39" wide x 28" deep x 20" high ● Stainless Steel Optional

PUMP OUT HOSE ASSEMBLY: 1 1/2" Polyflex Hose ● 90º Ball Valve ● Sight Glass/Check Valve ● Quick Clamp Adapter ● Complete Set of Deck Adapters ● 25 ft Length Standard ● 50ft Optional

HOSE STAND CONSTRUCTION: White Powder Coated Aluminum with Start/Stop Buttons Installed ● Remote NEMA 4 Start/Stop Control Box Optional ● Stainless Steel Optional

OPTIONS: 50' Hose Assembly ● Explosion Proof Motor ● Motors and Controls for Any Power Requirement ● Explosion Proof On/Off Switch ● Bronze Pump Out Hydrant 270BR-150

ORDERING INFORMATION

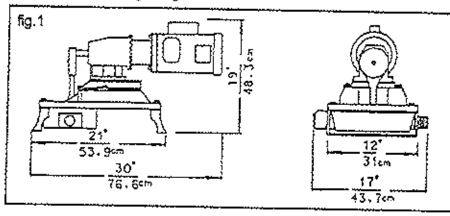
DESCRIPTION (See Price List For Other Models)	WEIGHT (Lbs / Kgs)	ORDER NO.
Diaphragm Pump Out Station	250 / 112	284EB-40

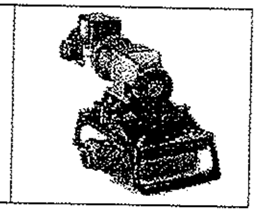
Edson INTERNATIONAL 146 Duchaine Blvd., New Bedford, MA 02745-1292 Tel. 508-995-9711 Fax 508-995-5021
E-Mail pumps@edsonintl.com www.edsonpumps.com

Edson Diaphragm Pump Out Systems 284EB-40

Pump: 3/4hp/1ph/115-230v/60hz/tefc gearmotor coupled to a 40 gpm diaphragm pump. All arranged on a painted aluminum frame with 2 mounting flanges.

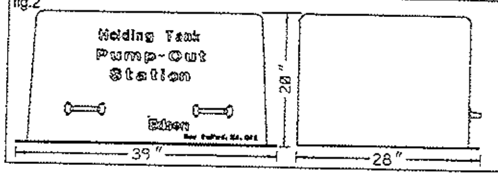
fig.1

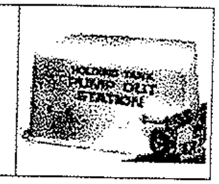




Pump Cover: White Fiberglass with Handles and Pump Out Sign. fig.2

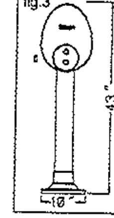
fig.2





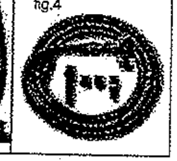
Hose Stand: White Powder Coated Aluminum with Start/Stop Buttons Installed, Operation Instructions Sign and (4) 1/2" X 7" Aluminum Hex Head Mounting Bolts. fig.3

fig.3



Hose Assembly: 25' X 1 1/2" Polyflex Hose, 90º Ball Valve, Sight Glass/Check Valve, Quick Clamp Adapter, Complete Set of Deck Adapters.fig.4

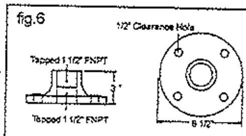
fig.4

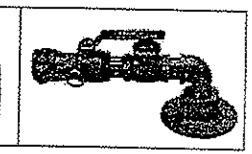


Control Panel with Timer and 24 Volt Remote Stop/Start: The Control Panel includes a 120/240 volt to 24 volt Transformer and a Timer to automatically shut off the pump after a selected time. The Red Stop Switch and the Green Start Switch installed in the Hose Stand operate on 24 volt for safety. Upon request they can be mounted in a separate nema-4 electrical box. fig.5

Hydrant (Optional): 1 1/2" Bronze Check Valve, Bronze Ball Valve and Quick Clamp Hose Adapter with Bronze Elbow and Close Nipple with Bronze Mounting Flange. fig.6 Order No. 270BR-150

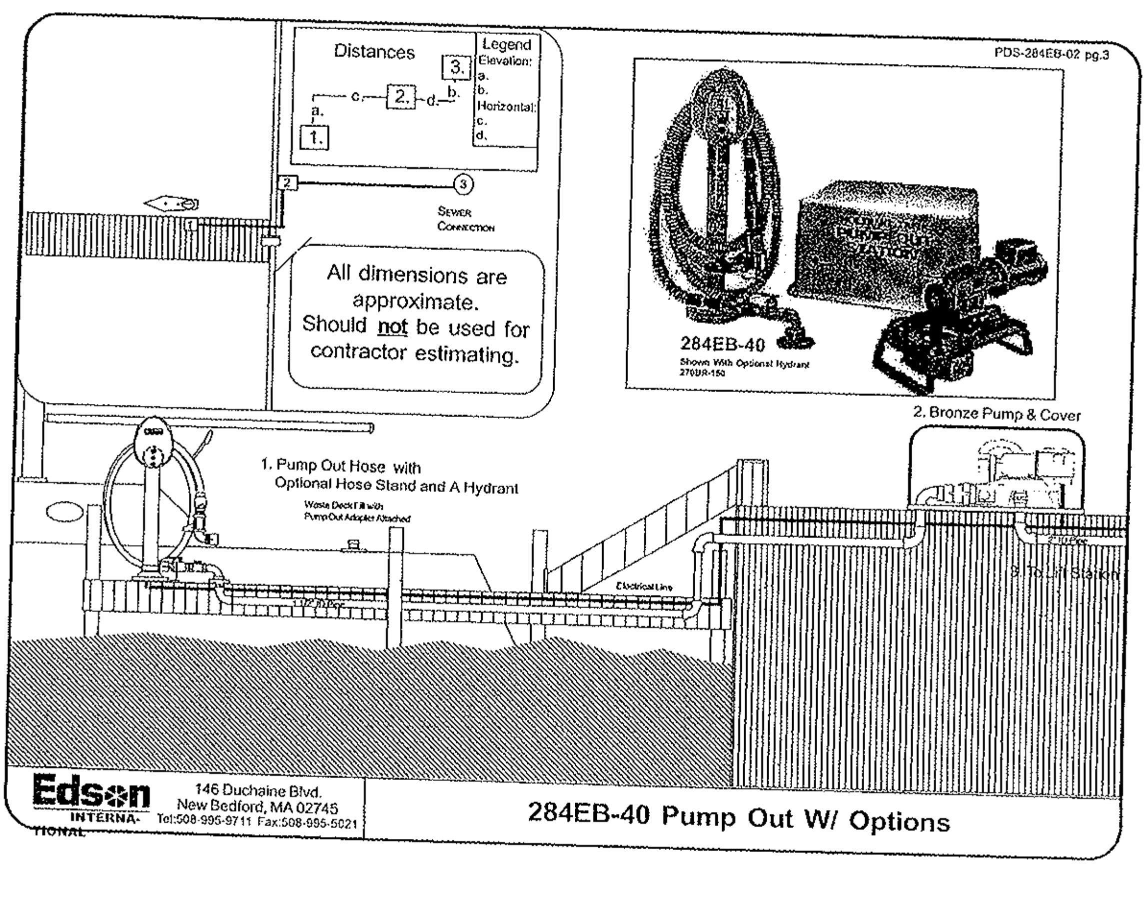
fig.6



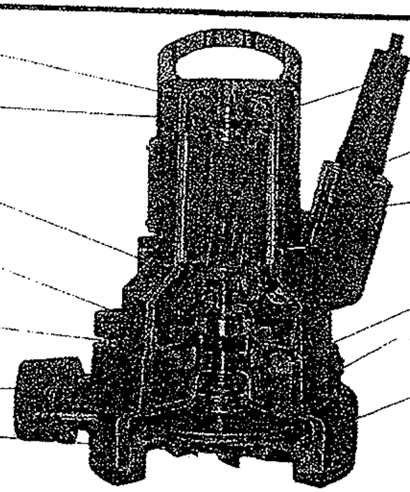


Edson INTERNATIONAL 146 Duchaine Blvd., New Bedford, MA 02745-1292 Tel. 508-995-9711 Fax 508-995-5021
E-Mail pumps@edsonintl.com www.edsonpumps.com

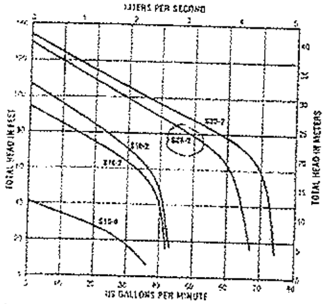
APPENDIX C
Wastewater Pump System



"S" Series Model



Performance



Consult an authorized ABS representative when selecting Piranha pumps for low head applications.

Specifications

Model	S10-4W	S10-4D	S16-2W	S16-2D	S18-2W	S18-2D	S26-2W	S30-2D
Voltage	230	230/460 575	230	230/460 575	230	230/460 575	230	230/460 575
Phase	1	3	1	3	1	3	1	3
RPM	1750	1750	3450	3450	3450	3450	3450	3450
HP	1.3	1.3	2.1	2.1	2.4	2.4	3.5	4.0
Standard Cable (ft.)	30	30	30	30	30	30	30	30
Discharge (inches)	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Height (inches)	14	14	14	14	14	14	14½	14½
Weight (lbs.)	70	70	70	70	71	71	88	88

Specifications are subject to change without notice.

Accessories

- ☐ Standard guide rail assembly
- ☐ Ball check guide rail assembly
- ☐ Vertical pedestal base
- ☐ Horizontal pedestal base
- ☐ ABS manufactured control panel — designed to enhance the operation and reliability of the pump

Sealminder – safety check system

Piranha pumps are equipped with a Sealminder probe in the oil chamber. Should the lower seal leak, allowing water into the oil chamber, the probe activates a warning light or audible alarm. This gives advanced warning allowing for the repair of the pump seal before water enters the motor.

The Piranha

The shredding rotor and ring of the Piranha System ensures efficient operation in sewage containing solids, and allows blockage-free pumping. Good reasons for being named after the voracious South American fish.

SPECIFICATIONS | PIRANHA "S" SERIES | 10/4 - 30/2

Dwg: DS-P03-005 Rev: A Date: 7/96 | Section Piranha | Tab "S" Series | Page 1.2

STANDARD & EXPLOSION PROOF

GENERAL

Furnish and install 2 Model S26/2 ABS Piranha Grinder Pump(s) to deliver 67 USGPM against a total head of 20 feet. The motor shall be 3.5 HP, 3500 RPM connected for operation on a 230 volt, 60 HZ, 1 phase service. The motor shall be an integral part of the pumping unit. The pump discharge shall be 1 ¼".

The grinder unit shall be capable of shearing and reducing to a fine slurry all material normally found in domestic and commercial sewage such as sanitary napkins, disposable diapers, cloth diapers, wash rags, wood, plastic, etc. The slurry shall be capable of freely passing through a 1 ¼" piping system including check and gate valves.

GRINDER PUMP CONSTRUCTION

The pump shall be of the centrifugal type with the rotating cutter mounted on the pump shaft directly against the impeller. The stationary cutter shall be mounted in an adjustable bottom plate. The stationary cutter shall have slots to facilitate better flow. The bottom plate shall be cast with grooves threading outward from the center opening of the plate to the outer diameter. The impeller shall be a multiple vane centrifugal type. The cutter material shall be similar to an ANSI 440C stainless steel with the addition of cobalt, vanadium, and molybdenum for superior abrasion resistance and a hardness of 58-62 Rockwell C.

The common pump and motor shaft shall be 420 stainless steel supported on the impeller end by a heavy duty single row ball bearing on 1.3-2.4 hp pumps, or a heavy duty double row ball bearing on 3.5-4 hp pumps. The opposite end of the shaft is supported on a sealed single row ball bearing (all models). The cutting elements and impeller shall be designed to keep the overhung load distance to a minimum. All fasteners shall be 304 stainless steel.

Shaft Seals: Each pump shall be equipped with two (2) seals. The lower seal (pump side) shall be of the mechanical type with silicon carbide faces. The upper seal shall be a lip type seal. The seals shall be separated by an oil chamber providing cooling and lubrication of the seals, and a barrier between the pumped fluid, and the dry motor chamber.

Seal Failure Warning System: An electric probe shall be provided in the oil chamber to detect the presence of water in the oil. A solid-state device mounted in the pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe. If water enters the oil chamber in sufficient quantity to warrant concern, the probe shall activate a warning light in the control panel.

MOTOR CONSTRUCTION

The motor shall be of submersible type rated for 3.5 HP at 3500 RPM. The full load current shall not exceed 13.7 amps at 230 volts. Single phase motors shall be of the capacitor start capacitor run type for high starting and running torque.

The motor shall be air-filled and shall have Class "F" insulation. The rotor and stator shall be enclosed in a cast iron outer housing. Bi-metallic thermal switches shall be imbedded in each phase of the winding to sense high temperature. The rating of the switch shall be 130°C +/- 5°C. The control circuit shall be connected through the bi-metallic switches so the motor is shut down should a high temperature condition exist. The switches shall be self-resetting when the motor cools. Power cable shall be rated for explosion proof environment

APPROVALS

All models shall be UL and CSA approved. Explosion proof models shall be FM approved for Class I Division I Group C and D.

TECHNICAL DATA — PIRANHA — S26/2W

Dwg. DS-P01-015 Rev: B Date: 2/00 | Section Piranha Tab "S" Series Page 1.10

STANDARD & EXPLOSION PROOF

MOTOR SPECIFICATIONS

Motor Design	NEMA design B, squirrel cage induction, air filled
Motor Type	Enclosed submersible
Insulation Class	Class F, rated at 155° C
Motor Protection	Oil Chamber Moisture Detector, bimetallic switches embedded in each phase for thermal overload protection. Installer must conform to N.E.C. standards, 1990 Ed. Art. 430.
Bimetallic Temp Trip	130° C ± 5° C
Service Factor	1.0
Voltage Tolerance	± 10% from nominal
Approvals	UL, CSA (FM available as option)

MOTOR DATA, 60Hz

Model	Phase	Output Power bhp	Volts	Full Load Amps	Locked Rotor Amps	NEMA Code Letter	Power Factor 100% Load	Motor Efficiency 100% Load	Pole/ Speed (rpm)
S26/2W*	1	3.5	230	13.7	65.5	D	0.99	83.4	2/3450

*Requires external start kit mounted in the control panel

MATERIALS of CONSTRUCTION

Motor Housing	Cast Iron ASTM A48 Class 30
Cable Cap	Cast Iron ASTM A48 Class 30
Volute	Cast Iron ASTM A48 Class 30
Oil Chamber	Cast Iron ASTM A48 Class 30
External Hardware	AISI 304 Stainless Steel
O-Rings	Buna-N
Motor Shaft	AISI 420 Stainless Steel
Cutter Disc Assembly	Chrome Molybdenum Cobalt Tool Steel 58-62 Rockwell "C"
Upper Bearing	Single row ball bearing.
Lower Bearing(s)	Double row ball bearing.
Upper Shaft Seal	Buna N Lip Seal
Lower Shaft Seal	Silicon Carbide
Impeller	Cast Iron, Open Multi-vane

DIMENSIONS, WEIGHT, AND MISC.

Pump weight (lb.)	82
Pump weight (lb.) (explosion proof)	83
Maximum submergence (foot)	33
Discharge size, standard	1¼ Inch
Discharge thread type	Female NPT
Maximum temp. of pumped fluid	40°C

CABLE SPECIFICATIONS

MODEL	POWER CABLE Quantity, Type	LENGTH, Feet
S26/2W	14/7 Type SOW-A	30

Power cable suitable for all standard voltages listed in "MOTOR DATA" section

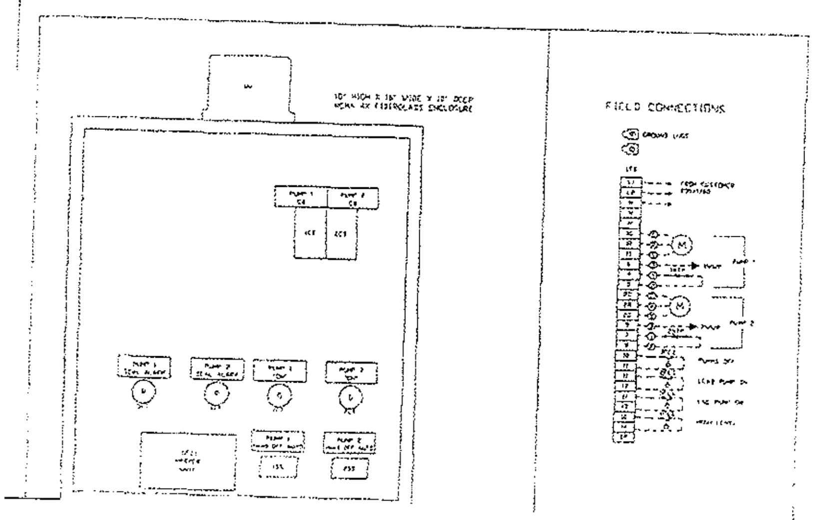
CONTROL PANELS — STANDARD QCII CONTROL PANELS

Dwg: DS-C00-001 Rev: Date: 11/96 | Section AFP Tab Accy & Controls Page 1.1

The QCII line of control panels are offered as a standard control for typical simplex or duplex pump applications. The control panels include the following:

- NEMA 4X fiberglass enclosure with aluminum inner deadfront.
- UL 508 listed industrial control panel.
- Thermal magnetic circuit breaker for each pump.
- IEC rated contactor, ambient compensated thermal overload relay for each pump.
- Klixon (internal motor thermal protection) wired to automatically shutdown pump upon an overtemp condition.
- Start capacitors, run capacitors, and start relays as required for single phase applications only.
- Hand-off-auto selector switches
- Green pump on indicator lights.
- Red seal failure indicator lights.
- ABS solid state sealminder water sensing relays.
- Alternating relay for duplex control panels only.
- Flashing high level alarm beacon.
- 150VA transformer for three phase, three wire systems only.
- Fuse for protection of 120VAC control circuit.
- 600 volt rated terminals for field wiring of panel.

Typical Duplex 230 volt 1 phase inner door layout

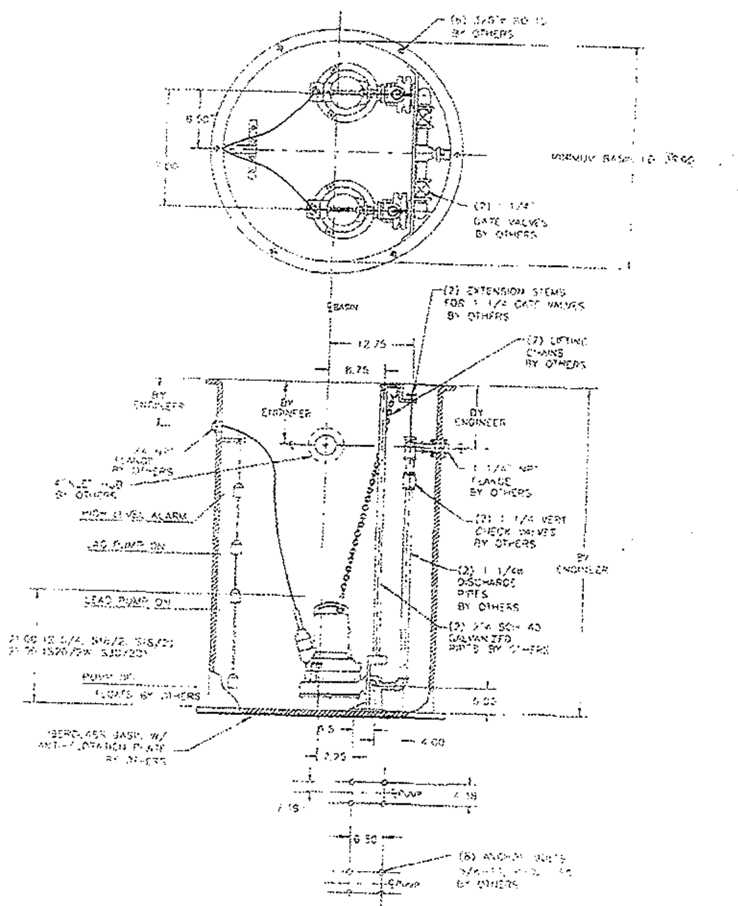


INSTALLATION DRAWING

PIRANHA "S" Series

Dwg: DS-P99-010 Rev: A Date: 10/99 | Section Piranha Tab Dimensions Page 1.10

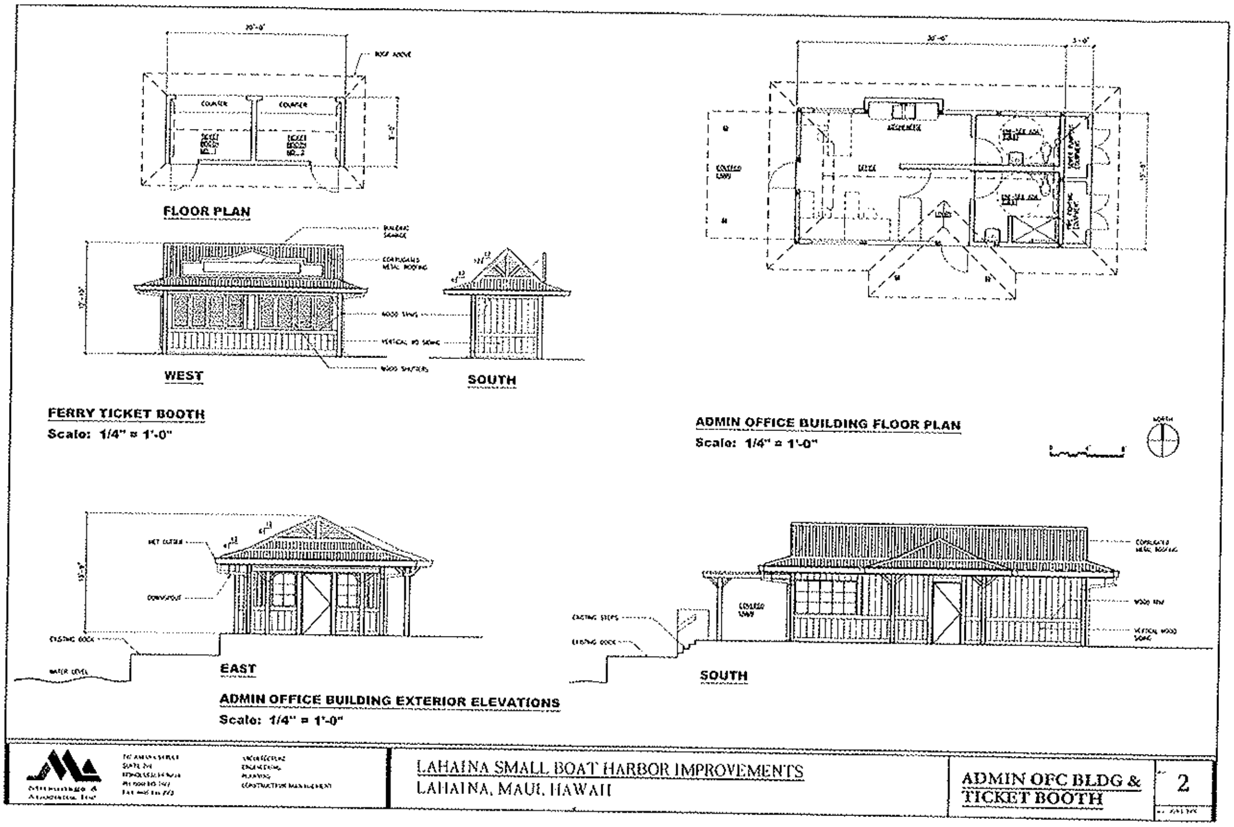
Piranha duplex basin installation with a fiberglass basin and an ABS standard guide rail assembly.

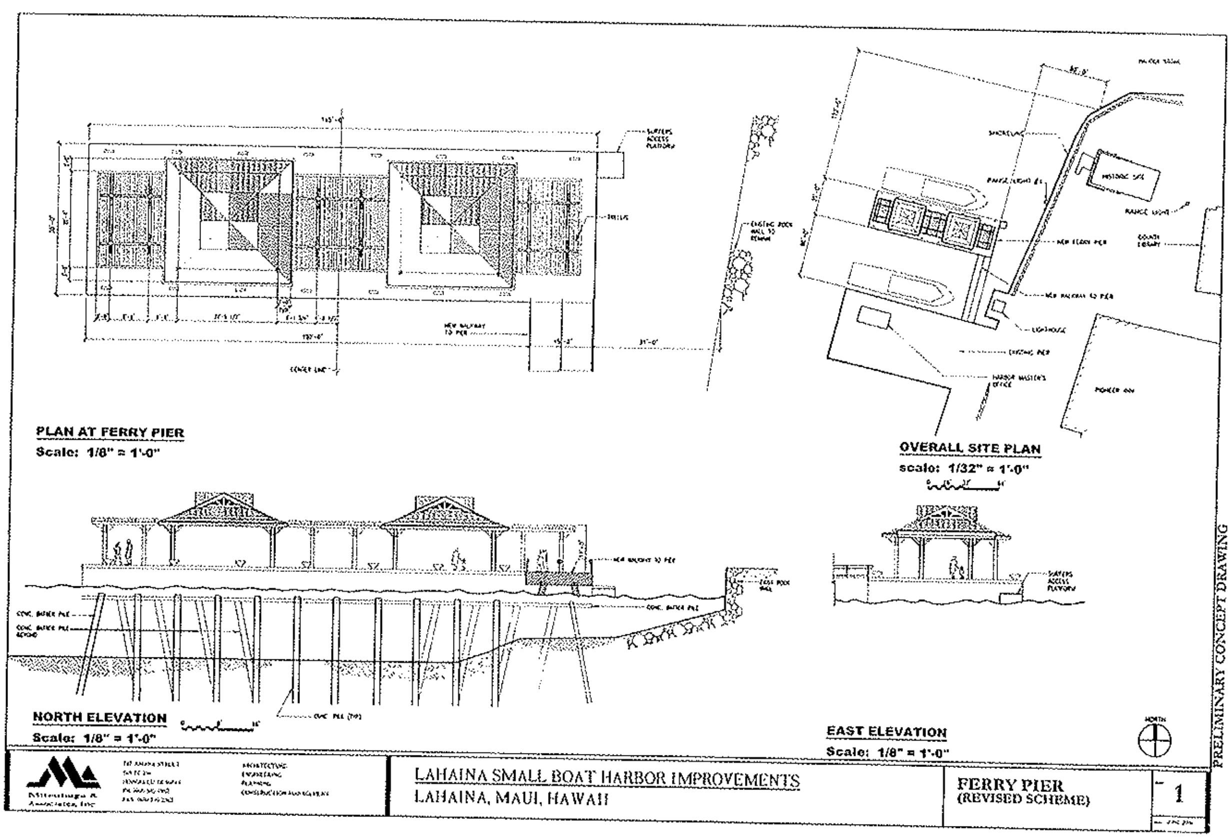


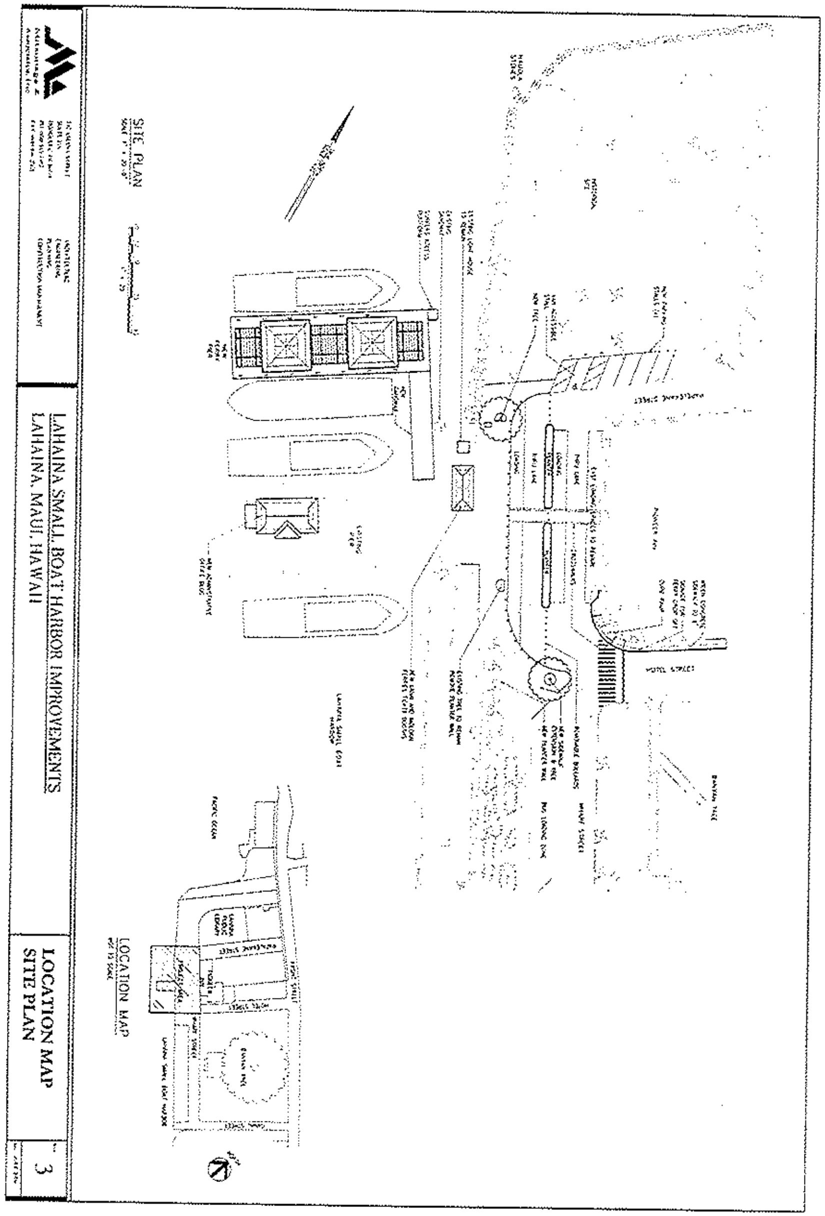
Important Note: Customer to give locations of discharge, conduit, and vent hubs prior to construction of basin assembly by ABS Pumps

ABS

APPENDIX D
Schematic Layout


FLOOR PLAN
WEST
SOUTH
FERRY TICKET BOOTH
Scale: 1/4" = 1'-0"
ADMIN OFFICE BUILDING FLOOR PLAN
Scale: 1/4" = 1'-0"
EAST
SOUTH
ADMIN OFFICE BUILDING EXTERIOR ELEVATIONS
Scale: 1/4" = 1'-0"
LAHAINA SMALL BOAT HARBOR IMPROVEMENTS
LAHAINA, MAUI, HAWAII
ADMIN OFC BLDG & TICKET BOOTH
2


PLAN AT FERRY PIER
Scale: 1/8" = 1'-0"
OVERALL SITE PLAN
scale: 1/32" = 1'-0"
NORTH ELEVATION
Scale: 1/8" = 1'-0"
EAST ELEVATION
Scale: 1/8" = 1'-0"
PRELIMINARY CONCEPT DRAWING
LAHAINA SMALL BOAT HARBOR IMPROVEMENTS
LAHAINA, MAUI, HAWAII
FERRY PIER
(REVISED SCHEME)
1



APPENDIX E
Cost Estimate

LAHAINA SMALL BOAT HARBOR FERRY PIER

PROJECT. LAHAINA SMALL BOAT HARBOR FERRY PIER, <u>SCHEMATIC CIVIL COST</u> PREPARED BY: MITSUNAGA AND ASSOCIATES
LAHAINA, MAUI DATE: MAY 2006

PROJECT NO.: SUBMITTAL:

ITEM NO.	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
	New Ferry Pier Improvements				
	Site Improvements				
1	Clearing/ Grubbing and Demolition	1.00	LS	$15,000.00	$15,000.00
2	Site Grading	10,000	SQ FT	$1.50	$15,000.00
3	2-1/2" A.C. Pavement	700	SQ FT	$6.00	$4,200.00
4	6" Decorative Concrete Pavement	13,000	SQ FT	$25.00	$325,000.00
5	4" Concrete Sidewalk	600	SQ FT	$10.00	$6,000.00
6	6" Concrete Curb	100	LIN FT	$25.00	$2,500.00
7	6" Aggregate Base Course	265	CU YD	$48.00	$12,711.11
8	Curb Ramp	1	EACH	$3,500.00	$3,500.00
9	Crosswalk Striping	330	LIN FT	$4.00	$1,320.00
10	Pavement Striping	1,000	LIN FT	$1.50	$1,500.00
11	Accessible Signage including Sign Posts	3	EACH	$500.00	$1,500.00
12	Ferry Signage	1	EACH	$1,000.00	$1,000.00
13	Removeable Bollards	42	EACH	$250.00	$10,500.00
14	Planter Wall	8	LIN FT	$80.00	$640.00
15	Planter	2	EACH	$450.00	$900.00
16	Landscaping	1	LS	$20,000.00	$20,000.00
17	Adjust Utility Box to Grade	2	EACH	$1,000.00	$2,000.00
18	Pollution/ Erosion Control	1	LS	$10,000.00	$10,000.00
	Subtotal				**$433,271.11**
	Water System				
19	Connect to Exist. Waterline	2	LS	$2,000.00	$4,000.00
20	Relocate Fire Hydrant and Assembly	2	LS	$5,000.00	$10,000.00
21	Relocate Fire System Cabinet	1	LS	$2,500.00	$2,500.00
22	3" Waterline	125	LIN FT	$120.00	$15,000.00
23	3/4" Waterline	50	LIN FT	$80.00	$4,000.00
24	Hose Bibs	2	EACH	$750.00	$1,500.00
25	Chlorination and Flushing for Waterline	1	LS	$2,000.00	$2,000.00
	Subtotal				**$39,000.00**
	Sewer System				
26	Connect to Exist. Sewerline	1	LS	$1,000.00	$1,000.00
27	3" Force Main	190	LIN FT	$120.00	$22,800.00
28	Sewer Manhole	1	EACH	$6,000.00	$6,000.00
29	Check Valve	2	EACH	$1,500.00	$3,000.00
30	3.5hp Grinder Pump Station	1	LS	$13,000.00	$13,000.00
31	Vessel Pump Out Station	2	LS	$4,500.00	$9,000.00
32	High Water Alarm	1	LS	$250.00	$250.00
	Subtotal				**$55,050.00**
	Mobilization/ Contingency (20%)				$105,464.00
	TOTAL ESTIMATED COST				**$632,785.00**

APPENDIX A-1.

Lahaina Small Boat Harbor Ferry Pier Improvements Quantity Takeoff and Cost Estimate

Lahaina SBH Ferry Pier Improvements Quantity Takeoff and Cost Estimate

Prepared by: E. Yuasa, Engineering Division

Date: May 31, 2007

Alternative No. 1

New concrete pier and walkway structures

Concrete walkway: 60 feet X 16 feet wide (960 SF) and abutment

Sheet Pile and Fill Structure: (115 feet + 35 feet) X 2 = 300 Lineal feet
300 LF X 17' deep = 5,100 SF
Fill: 115 feet X 35 feet wide X 17' deep = 68,425 CF or 2,534 CY

Dredging of entrance channel and turning basin approximately 2,500 CY

Administration Building: 25' X 100' = 2,500 SF

Cost Estimate:

Item	Quantity	Unit Cost	Total
Mobilization and demobilization	LS		300,000
Demolition existing pier structure	740 SF	50	37,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
Concrete walkway and pier:			
Concrete abutment	LS		100,000
Concrete walkway	960 SF	300	288,000
Sheet pile	5,100 SF	233	1,188,300
Fill material	2,534 CY	30	76,020
Concrete pier	4,025 SF	350	1,408,750
Sewer pump out	2 Each	5,000	10,000
3.5 hp grinder sewer pump station	LS	25,000	25,000
Force main from pump out to pump station	300 LF	60	18,000
Sewer lateral from pump station to County sewer system	200 LF	120	24,000
Sewer manholes	2 Each	7,000	14,000
6" Waterline	200	150	30,000
Fire hydrants	2	5,000	10,000
3/4" Waterline and hose bibs	70	80	5,600
Relocate fire system cabinet	LS		3,000
Drainage system	LS		30,000
Electrical upgrades	LS		550,000
Administration Building	2,500	500	1,250,000
Surfer access	LS		30,000

Item	Quantity	Unit Cost	Total
Vehicle and pedestrian traffic improvements	LS		300,000
			5,947,670
Construction contingency (10%)			594,767
Planning work	LS		600,000
Design work	LS		900,000
Construction management	LS		594,767
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
Total			8,817,204

Alternative No. 2

New concrete pier and walkway structures

Concrete walkway: 60 feet X 16 feet wide (960 SF)
Support piles: Assume 12 piles (based on concept plan dated 12-27-04)

Sheet Pile and Fill Structure: 115 feet X 35 feet wide (4,025 SF)
300 LF X 17' deep = 5,100 SF
Fill: 115 feet X 35 feet wide X 17' deep = 68,425 CF or 2,534 CY

Dredging of entrance channel and turning basin approximately 2,500 CY

Covered Waiting Area: 28.5' X 28.5' = 812.25 SF X 2 = 1,625 SF
Open Trelis: 22.5' X (14.5' + 18' + 14.5') = 1,058 SF

Administration Office: 23.5' X 35' = 823 SF

Cost Estimate:

Item	Quantity	Unit Cost	Total
Mobilization and demobilization	LS		300,000
Demolition existing pier structure	740 SF	50	37,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
Concrete walkway and pier:			0
Concrete piles	12	20,000	240,000
Concrete walkway	960 SF	300	288,000
Sheet Pile	5,100 SF	233	1,188,300
Fill Material	2,534 CY	30	76,020
Concrete pier	4,025 SF	350	1,408,750
Sewer pump out	2 Each	5,000	10,000
3.5 hp grinder sewer pump station	LS	25,000	25,000
Force main from pump out to pump station	300 LF	60	18,000
Sewer lateral from pump station to County sewer system	200 LF	120	24,000
Sewer manholes	2 Each	7,000	14,000
3" Waterline	200	120	24,000
Fire hydrants	2	5,000	10,000
3/4" Waterline and hose bibs	70	80	5,600
Relocate fire system cabinet	LS		3,000
Drainage system	LS		30,000
Electrical upgrades	LS		250,000
Open Shade Structure	1,625 SF	150	243,750
Open Trellis	1,058 SF	50	52,900
New ferry office	100 SF	250	25,000
Administrative office	823 SF	500	411,500

Item	Quantity	Unit Cost	Total
Surfer access	LS		30,000
Vehicle and pedestrian traffic improvements	LS		300,000
			5,264,820
Construction contingency (10%)			526,482
Planning work	LS		600,000
Design work	LS		600,000
Construction management	LS		526,482
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
Total			7,697,784

Alternative No. 3:

Quantity Take-off:

New concrete pier and walkway structures

Concrete walkway: 60 feet X 16 feet wide (960 SF)
Support piles: Assume 12 piles (based on concept plan dated 12-27-04)

Concrete Pier: 115 feet X 35 feet wide (4,025 SF)
Support piles: Assume 88 piles (based on concept plan dated 12-27-04)

Dredging of entrance channel and turning basin approximately 2,500 CY

Covered Waiting Area: 28.5' X 28.5' = 812.25 SF X 2 = 1,625 SF
Open Trelis: 22.5' X (14.5' + 18' + 14.5') = 1,058 SF

Administration Office: 23.5' X 35' = 823 SF

Cost Estimate:

Item	Quantity	Unit Cost	Total
Mobilization and demobilization	LS		300,000
Demolition existing pier structure	740 SF	50	37,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
Concrete walkway and pier:			0
Concrete piles	100 Each	20,000	2,000,000
Concrete walkway	960 SF	300	288,000
Concrete pier	4,025 SF	350	1,408,750
Sewer pump out	2 Each	5,000	10,000
3.5 hp grinder sewer pump station	LS	25,000	25,000
Force main from pump out to pump station	300 LF	60	18,000
Sewer lateral from pump station to County sewer system	200 LF	120	24,000
Sewer manholes	2 Each	7,000	14,000
3" Waterline	200	120	24,000
Fire hydrants	2	5,000	10,000
3/4" Waterline and hose bibs	70	80	5,600
Relocate fire system cabinet	LS		3,000
Drainage system	LS		30,000
Electrical upgrades	LS		250,000
Open Shade Structure	1,625 SF	150	243,750
Open Trellis	1,058 SF	50	52,900
New ferry office	100 SF	250	25,000
Administrative office	823 SF	500	411,500
Surfer access	LS		30,000

Item	Quantity	Unit Cost	Total
Vehicle and pedestrian traffic improvements	LS		300,000
			5,760,500
Construction contingency (10%)			576,050
			0
Planning work	LS		600,000
Design work	LS		600,000
Construction management	LS		576,050
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
			0
Total			8,292,600

APPENDIX B.

Archaeological Inventory Survey for the Lahaina Harbor Improvements and New Ferry Project, Waihee Ahupua`a, Lahaina District, Maui Island, Hawai`i, May 2006

Pacific Legacy

Incorporated

Cultural Resources Consultants

ARCHAEOLOGICAL INVENTORY SURVEY FOR THE LAHAINA HARBOR IMPROVEMENTS AND NEW FERRY PROJECT WAINE`E AHUPUA`A, LAHAINA DISTRICT, MAUI ISLAND, HAWAI`I (TMK: 2-4-6-01: 02, 14, 17)

Prepared By:
Pacific Legacy, Inc.

ARCHAEOLOGICAL INVENTORY SURVEY FOR THE LAHAINA BOAT HARBOR IMPROVEMENTS AND NEW FERRY PROJECT MAUI ISLAND, HAWAI`I

Prepared by
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May 2006

ABSTRACT

Pacific Legacy, Inc. at the request of EKNA Services, Inc. conducted an archaeological assessment and cultural impact assessment (CIA) for the proposed Lahaina Pier Improvement Project, *ahupua`a* of Waine`e, Maui, Hawaii. These assessments were conducted as an "undertaking" in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

The Lahaina Pier Improvement Project is located in the Lahaina Historic District, registered as a National Historic Landmark and on the National and State Register of Historic Places. The improvements include the construction of a new pier, and possible widening and deepening of the entrance channel and berthing area. The archaeological assessment was conducted to determine the affect of the developmental improvements, on the historic landmark and prehistoric features in the Lahaina Pier vicinity.

To gather information about the Lahaina area, for the CIA, background research was undertaken and interviews were conducted with people knowledgeable about the area known as Lahaina today. The interviewees were either cultural practitioners in Lahaina, or from Lahaina.

The Hauola Stone is in the vicinity of the project area, and any activities impacting the stone would also impact the whole Lahaina Area. The Hauola Stone is a healing stone as well as a birthing stone. It is the area's link to life and health. The stone, Site 50-50-03-1202, was evaluated for its significance to the National Register of Historic Places by criteria defined at 36 CFR §60.4.

It is recommended that extreme care be used near the two historic sites in the vicinity of the proposed construction area. Further dredging of the reef is not recommended as they would come too close to the Hauola Stone and could also negatively impact the surf at Keawaiki. While several other historic sites are outside the project area, there is a low potential of affecting any of these features.

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LIST OF FIGURES

*Frontispiece: The Carthaginian II viewed from the Hauola Stone.

1.0 INTRODUCTION

Pacific Legacy, Inc. under contract to EKNA Services, Inc. conducted an archaeological assessment and a cultural impact assessment (CIA) for the Lahaina Harbor improvement project located in the *ahupua`a* of Waine`e on the island of Maui. The assessments were conducted as an "undertaking" in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The improvements will consist of building a new ferry pier, and possibly widening and deepening the entrance channel to the harbor. This project is being proposed by the State Department of Land and Natural Resources - Division of Boating and Ocean Recreation (DLNR-DBOR) to improve the harbor facilities at Lahaina. This archaeological assessment and CIA were conducted as part of an Environmental Impact Assessment (EIS) being conducted for this project. Solomon H. Kailihiwa, III, B.A. performed the fieldwork on Maui from 3 May 2004 to 7 May 2004. Paul Cleghorn, Ph.D. served as principal investigator.

The primary means of collecting information for the archaeological assessment was conducted through archival research at the State Historic Preservation Division (SHPD) library and the state library and archives. Research found that numerous historic sites, prehistoric sites and burials have been found in and around the Lahaina Historic District. Two existing historic sites in the area have a potential for being impacted by the proposed construction and it is recommended that extreme care be used near the sites. The majority of sites still exist, however there is a low potential that these sites would be affected by the project. There is also a low potential of finding any prehistoric sites.

The CIA follows the Office of Environmental Quality Control guidelines for assessing cultural impacts The purpose of a cultural impact assessment (CIA) is to identify traditional cultural practices which could be compromised by proposed development projects, and to comply with the Hawai'i State Department of Health Act 50.

The CIA guidelines state that project properties as well as surrounding property areas, shall be studied to determine the potential for significant and/or adverse effects on cultural practices of the community and State from the proposed construction or development. These guidelines also recommend personal interviews be conducted with knowledgeable informants and traditional cultural practitioners, concerning the cultural practices identified for the area.

On April 26, 2000 Governor Ben Cayetano signed Act 50 into law. The following CIA investigations are intended to satisfy Act 50, which has the stated purpose to:

> (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

To gather information about the Lahaina Harbor area, background research was undertaken and interviews were conducted with people knowledgeable about the area known as Lahaina today.

1.2 Environmental Setting

The Lahaina Pier Improvement Project is in the District of Lahaina, on the island of Maui, Hawai`I (Figure 1). Maui is the second largest island in Hawai`i and formed by two volcanoes, Haleakalā and Hale Mahina. Lahaina is on the west coast of Maui, in one of the drier regions of the island. The area of Lahaina receives the lowest amount of average annual rainfall, at 15 inches per year (Juvik and Juvik 1998). During the winter months it is common for the tradewinds to cease, producing heavy humidity and storms from the south (Klieger et al 1995).

The town of Lahaina is situated on Pulehu silt loam, 0 to 3 percent slopes (PpA) (Sato et al. 1972: map 94, jp. 116). This soil is typical of sugarcane fields, homesites, and wildlife habitat.

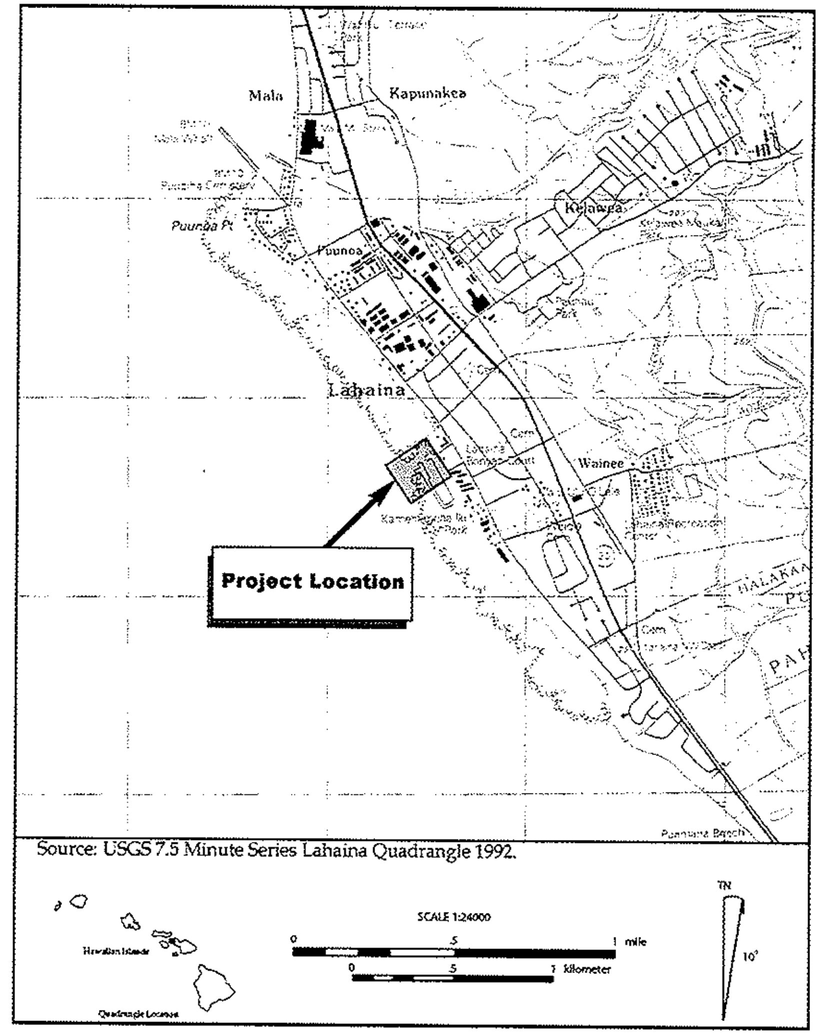

Figure 1. Proposed Project Location.

2.0 METHODS

The primary means of collecting information for the archaeological assessment was conducted through archival research at the State Historic Preservation Division (SHPD) library and the state library and archives.

In order to perform the CIA investigation, attempts were made to contact various people that were knowledgeable of the Lahaina area. The people interviewed ranged from cultural practitioners to those born and raised in Lahaina. Many *Kanaka Maoli* (native Hawaiian) terms are used throughout the report. The depth of the Hawaiian language is such that, often, much is lost in translation to English. To hold the ideas from the *Kānaka Maoli* that were interviewed truer to form, terms are left in their Hawaiian form rather than being translated into English. An English explanation of the Hawaiian term is presented at first usage to give the non-native speaker an idea of the word's meaning.

Semiformal interviews were conducted and recorded on audio microcassettes. The interviews followed a "talk-story" format and the questions led to themes so that the interviewee would be able to tell what he or she thought was most important to them. The audio microcassettes were not transcribed. The interviewees that agreed to a taped interview signed a release form. The microcassettes and release forms are on file at Pacific Legacy.

2.1 INTERVIEWEES

The following people were recommended by respected members of the Maui community as individuals that would be knowledgeable of the Lahaina Area.

Akoni Akana is the executive director of Friends of Moku`ula, a nonprofit organization dedicated to restoring, protecting, and preserving historically significant sites including the island and pond in Lahaina known as Moku`ula and Mokuhinia respectively.

George "Keoki" W. Freeland is the executive director of the Lahaina Restoration Foundation, a nonprofit organization that strives to faithfully restore, maintain, and interpret the physical, historical, and cultural legacy of Lahaina.

George Manulani Kaimiola is a volunteer with the Maui Historical Society and the Friends of Moku`ula and conducts the historical Lahaina walking tours for Maui Nei. Maui Nei is a cultural tourism company dedicated to presenting the traditions of Hawaii to Maui's visitors, and works in partnership with Friends of Moku`ula.

**Ke`eaumoku Kapu** is the vice president of Hui O Wa`a Kaulua, a nonprofit organization currently based in Lahaina devoted to educating Hawaii's youth in the Hawaiian culture through double-hull and single-hull canoe sailing activities.

Charles Lindsey currently works for the Kaho`olawe Island Restoration Commission (KIRC). He was born and raised in Lahaina. The Lindsey family is one of the few old Lahaina families that has retained its property on Front Street.

Nā Kūpuna O Maui is an organization of respected elders of the Maui Community.

Ann Kaleilokelani Tsuha (Kalei) also works for the KIRC. She was born and raised in Lahaina. Kalei is the education/cultural chair for the Hui O Wa`a Kaulua.

3.0 HISTORICAL BACKGROUND

The town of Lahaina is believed to have acquired its name from a traveling chief on his journey through the island of Maui. During the chief's voyage, he stopped in Lahaina at noon to rest and commented "*kau keia ka la-haina*", which literally means cruel sun (Maui Historical Society 1961). The original pronunciation was Lā-hainā, but over time the diacriticals have been dropped (Pukui et al. 1976: 127). But there are also other suggestions as to the origin of the name, that Lahaina was once known as *Lele* (to jump around) because of the *ali`i* short stays on the island (Klieger et al. 1995).

Kahekili, a well-known Maui chief, ruler of all the islands except Hawai`i, made his home and royal court at Lahaina from 1736 until his death in 1794. Soon after Kahekili's death, Kamehameha I returned to Maui and chose to establish his home and government out of Lahaina. Kamehameha I was very influential in the lucrative sandalwood trade (1790's-1829) which Lahaina served as the main Maui port to ship goods to China. But when Kamehameha I died in 1819 his son Kamehameha II (Liholiho) (1796-1824) was unable to maintain the strong leadership his father had possessed and the royal seat along with the town of Lahaina began to lose its strength. The young king made the decision to give the chiefs more power and allowed one of his fathers wives to begin violating Hawaiian taboos, thus leading to the conversion of many Hawaiians to the Catholic faith by missionaries who had arrived in 1820 (Day 1984). In 1819, the first whaling ships arrived to Honolulu and Lahaina ports, and Kamehameha II used the growing whaling trade (1819-1859) as his bargaining power with the chiefs (Bartholomew and Bailey 1994).

In 1825, Kauikeaouli (Kamehameha III), younger brother of Liholiho, seceded to the throne. Synonymous with the Kamehameha III reign was also the institution of the Lahaina as the capital from 1820-1840 (Bartholomew and Bailey 1994). With Kamehameha III at reign, he began establishing a new palace in Lahaina. Construction of the palace continued after the king's death in 1854, but before the construction was complete a strong wind-storm demolished the structure in 1858 (ibid.).

Lahaina was increasingly becoming overwhelmed with the whaling ships and their crews beginning in 1820. A total of 549 whaling ships had landed in Lahaina in 1854. However, the unruly crews totaling 1250-1500 men looking for drink and women where living by the saying "No God west of the Horn" led to their unwillingness to behave (Community Planning Inc. 1961). While these unruly sailors helped Lahaina flourish commercially, the recession of the whaling industry in 1860 had a direct negative affect on the town of Lahaina.

It was not until the United States Civil War (1861-1865) that the whaling industry and the town of Lahaina felt its biggest decline. Once the port of San Francisco was developed and the transcontinental railroad was running, whaling ships no longer had a purpose to sail to the Hawaiian Islands because the San Francisco Port was larger and more accessible. As the whaling industry declined in Lahaina, the Lahaina Sugar Company and Pioneer Mill was

established in 1861 (Monahan 2003). Pioneer Mill's railroad allowed the sugar to be processed and bagged in Lahaina and then taken by train to Pu`u Keka`a (McGerty and Spear 2003).

By the 1960's the plantations were going into decline as there was a rise in tourism around the Kaanapali and Lahaina area (McGerty and Spear 2003). The presence of golf courses, hotels, resorts and shops continued to increase and bring the tourism industry to the Lahaina District.

Presently, the core of Lahaina Town is a tourist/resort destination primarily comprised of retail shops and restaurants. The town is also the location for cruise ships to motor tourist in once they have anchored offshore, allowing for heavy flows of pedestrian traffic. But just a few blocks back from the main Front Street is the local Lahaina community and residential area. This mixture of locals and visitors still exist from the days of the sandalwood and whaling fleets to today, allowing the Lahaina Historic District to maintain its historic whaling-era atmosphere.

3.1 Lahaina Historic District

On December 29, 1962 the Lahaina Historic District was listed as a National Historic Landmark, because "Lahaina preserves the atmosphere of a mid-19th century Hawaiian seaport, when it was a favorite port of call for American whalers. It was also the center of missionary activities" (National Historic Landmark, nd)

In 1970, the Lahaina Historic District was nominated to the National Register of Historic Places (See Appendices A and B). It was listed in on the Hawaii Register of Historic Places in 1971 (See Appendix C). The district boundaries include an arbitrary rectangular land boundary of 33 acres; the northeast boundary lies above Honoapiilani Highway and includes the Pioneer Sugar Mill, the south boundary is the beginning of the Makila site, the southwest boundary runs into the Pacific Ocean, and the north boundary stops at Puunoa Point (Figure 2). In the National Survey of Historic Sites and Buildings Registration Form, the following principal historic sites and structures were listed (National Register of Historic Places 1970):

3.1.1 The Baldwin House

In 1834, Ephraim Spaulding began the construction of what is now known as the Baldwin House. The house is located on Front Street at Dickenson Street. The two-story house is constructed from coral blocks and sits on 42,360 square feet of property (National Register of Historic Places 1970). The Spauldings took residence of the home in 1835; however they only resided in the house until 1836 when Dr. Dwight Baldwin and his family moved in to replace the Spauldings. The Baldwin's lived in the home until 1868 when Dr, Baldwin was transferred to Honolulu. Along with being a government physician for the islands of Maui, Molokai, and Lanai, Dr. Baldwin's positions also included pastor of the Hawaiian church of Lahaina, seamen's chaplain, and a medical doctor. It was also his duty to greet guests to the Lahaina Mission and the nearby Lahainaluna Seminary. With all of Dr. Baldwin's company and business affairs he expanded the house in 1847-1849 to include a dispensary and office.

Dr. Baldwin and his wife had their son Henry P. Baldwin in the Baldwin home and as Henry got older he and his wife, became very involved on the Island of Maui. Mrs. Henry P. Baldwin used the home to sponsor a community center in which the house acted as the center for a kindergarten, night-school, circulating library, language school, and high school. These activities helped establish the house as a center for Hawaiian social and cultural development. At the time the National Registration Form was filed the home was no longer being used for any purpose but remained in "excellent condition" (National Register of Historic Places 1970).

3.1.2 Old Spring House

The Old Spring House is known as one of the last links to the whaling era. The small stone building is located south of the Baldwin House, off Front Street. Constructed by Rev. William Richards in 1823, the spring house served as a water supply to the Richard's residence, the entire community, and for ships anchored at the Lahaina Pier including the whaling ships and their crews.

3.1.3 Court House

The Court House as it now stands is not the original court house. In 1858 the original court house was destroyed by forceful winds from Kauaula Valley. The Interior Department responded to request for reconstruction of all the government offices affected by the storm and the government gave Lahaina an appropriation of $6000.00 for the Lahaina Court and Custom House and Government Offices to be repaired.

The building was rebuilt again in 1925 but the structure still maintains part of the old structure with additions. The Court House was determined eligible to be included in the Lahaina Historic District because of its links to the kingdom. Located in front of the Court House is "Hawaii's largest" banyan tree (National Register of Historic Places 1970).

3.1.4 Old Prison (Hale Paahao)

Located on the corner of Prison Road and Wainee Street, the Old Prison was built of heavy planks enclosed by a coral wall. During the whaling era the prison held many uncontrollable seamen along with the normal criminals of Lahaina. Most criminals were put into the prison for not obeying the sundown curfew. In 1852 on the request of the prison's physician a new sleeping facility for the prisoners was constructed. The physician believed the old sleeping arrangements were unhealthy and many illnesses could be prevented if the prisoners had better sleeping quarters. The original cell house burnt down in 1958; in its place a wooden gate house was constructed in 1959. The prison now serves as a historic tourist site.

3.1.5 Wainee Church and Cemetery (Waiola)

The present church on Wainee Street between Chapel and Shaw Streets was recently constructed in 1953. The church and adjoining cemetery are owned by the Waiola Protestant Church.

When the missionaries first arrived, services were held in temporary structures until 1832 when a new stone church ordered by chief Hoapili was finished. However, this church could not withstand strong storms and was destroyed once and then again by a fire in 1894. The current church was dedicated in 1953 and renamed Waiola.

Unlike the church, the cemetery has remained in its same location even with all the structural changes to the church. It is believed to date to 1823 when the missionaries first arrived. It contains the bodies of Hawaiian royalty such as, Keōpūolani, wife of Kamehameha I. Other nobles include Governor Hoapili, King Kaumualii, Princess Nahienaena, Queen Kalakua and Governess Liliha. Also, pioneer missionary the Rev. William Richards who advised the Hawaiian monarchy is buried in the Waiola Cemetery (National Register of Historic Places 1970).

3.1.6 Hale Aloha

Known as the first stone church in the islands, Hale Aloha is situated In the middle of Wainee, Hale, and Chapel Streets and Prison Road and is said to have been built in 1823. The 15,900 square feet of land is owned by Waiola Protestant Church. The church was rebuilt in 1855-1858. At the time of its reconstruction it was "the largest sectional meeting house of its time" (National Register of Historic Places 1970: 7).

3.1.7 United States Marine Hospital

The United States Marine Hospital is owned by the Bernice P. Bishop Estate and sits on the northeast side of Front Street, between Kenui and Baker Streets. The hospital's date is uncertain but there are references to it by 1843 from Herman Melville (Maui Historical Society 1961). The two-story coral block building was sold to three Sisters of Society of the Holy Trinity who turned the hospital into the St. Cross School for girls. Once the school was moved to Oahu the church housed the Episcopal Minister but was later abandoned in 1908. The building's significance is its connection with the maritime days (National Register of Historic Places 1970).

3.1.8 Roman Catholic Church (Maria Lanakila First Catholic Church)

The site of the Roman Catholic Church is on Wainee and Dickenson Streets. The first church located on the property was built in 1846. By 1858, the original church had been destroyed and a new church was constructed on the same property. It is unclear how long this church survived but another church was built in 1928. This church is still in existence today and said to contain parts of the original 1846 church, such as the ceiling (National Register of Historic Places 1970).

3.2 Contributing Sites

The Lahaina Historic District is comprised of the above described eight historic sites listed on the Lahaina Historic District Nomination Form, and several other contributing elements. The State Historic Preservation Division inventory of National and State Register of Historic Places, list the Lahaina Historic District as being comprised of approximately 60 sites. However, there are only a few individual records and descriptions for the sites. This suggests the other contributing elements have not been formally evaluated for their significance to the Lahaina Historic District.

3.2.1 Kamehameha I's Brick Palace (Site 50-50-03-2951) (Figure 4)

Kamehameha I's Brick Palace was once located on Wharf Street between Market Street and Papelekane Street. Kamehameha I, resided in this palace from 1802, for a little over a year while he collected taxes on Maui, Lanai, Molokai, and Kahoolawe (Maui Historical Society 1964). It is unclear when the structure was destroyed. Today, the brick foundation of Kamehameha I's Palace is still visible. The Palace is a contributing site to the Lahaina Historic District because it was built with the intentions of entertaining captain's from visiting whaling ships during the whaling era.

3.2.2 Aus Site (Site 50-50-03-1797) (Figure 4)
The "Aus Site" is located at 731 Wainee Street on the west side of Seaman's Hospital. The site consisted of three refuse pits. Within the three pits, the artifacts recovered include, a variety of glass sherds, a probable adze fragment, grooming tools, leather, batteries, and other historic artifacts. These artifacts are from the late 19th or early 20th century (Frederickson et al. 1988).

3.2.3 Site 50-50-03-2968 (Figure 4)
The State Historic Preservation Division had no description for site 50-50-03-2968 (State Historic Preservation Division, GIS).

3.2.4 Human Remains (Site 50-50-03-3550) (Figure 4)
Site 50-50-03-3550 is a single human burial. Associated artifacts with the burial included volcanic glass sherds (State Historic Preservation Division, GIS) (See Figure 4).

3.2.5 Heiau (Figure 7)
Before 1823, a heiau existed on the future site of the Lahaina Wharf. After 1823, the stones from the Heiau were removed and used to surround the tomb of Keōpūolani. Keōpūolani was the wife of Kamehameha I and mother of Kamehameha II and III (Community Planning Inc. 1961).

3.3 Non-Contributing Sites

3.3.1 Hau`ola Stone (Site 50-50-03-1202) (Figure 4)
The Hau`ola Stone, also known as, Pōhaku Hau`ola, still exist today in it original location and is still used by Native Hawaiians (See Section 5.2). The Hau`ola Stone is a large couch shaped boulder, which is located in shallow water, on the north side of the Lahaina Pier (Figures 4, 5, and 6). Legend says, a woman trying to escape from her enemies was saved by the gods, when they turned her into stone (James 2001). Tradition states that the stone contains healing properties. It is believed to cure labor pains and rejuvenate health. The Hau`ola Stone is also a sacred place where the umbilical cords of new born children are placed. During the time of chiefs, it was thought that by hiding the umbilical cord in the rocks crevices, the child would grow up to be a chief (Maui Historical Society 1961). Today umbilical cords are still placed in the rocks crevices to hide the cord from rats. The belief is, if a rat eats the cord the child will become a thief (See Section 5.2).

3.4 Carthaginian II

The original Sweden-constructed Carthaginian sunk off-shore of Kihei, about thirty years ago on a trip to Oahu. The Carthaginian II was chosen to replace the old whaling vessel and has been anchored at the Lahaina Pier for over thirty years. The Carthaginian II is a German-made vessel christened in 1920, making the ship 84 years old. The ship houses a whaling museum

inside, which serves as a tourists attraction and the ship has been photographed and painted in various depictions of Lahaina. Currently the Carthaginian II is owned by the Lahaina Restoration Foundation (Wilson 2002). High costs to maintain and berth the Carthaginian II are forcing the Lahaina Restoration Foundation to donate the ship to Atlantis Adventures, who plan to sink it off shore of Lahaina as an artificial reef site.

3.5 Land Commission Awards

Land Commission Awards for the Lahaina Historic District and the proposed project area can be found on the tax map key 4-6-09. The Lahaina Historic District is in the *ahupua`a* of Polanui, Pahoa, Puehuehunui and Wainee. The proposed project in the Lahaina Harbor, is in the *ahupua`a* of Wainee. In the *ahupua`a* of Wainee, several Land Commission Awards were granted; they were awarded as follows:

Land Commission Award	Awardee
322	Kaipo
6869.2	Kawaioahu
4533.2	Ualo
5207B.2.	R. Kalaipaihala
752	A.M. Birch
4878.1	Makaiole
6787.1	Hanaumua
6786	Kamohomoho
484.3	Kaihe`ekai
3425.1B	Alu
6795	Kaluahine Nui
241	S.O. Burrows
6218.1	Maunae
4878-FF1	Po`opu`u
6784.2	Na`ai
4878.2	Olala
6784.1	Na`ai
5207B.3	R. Kalaipaihala

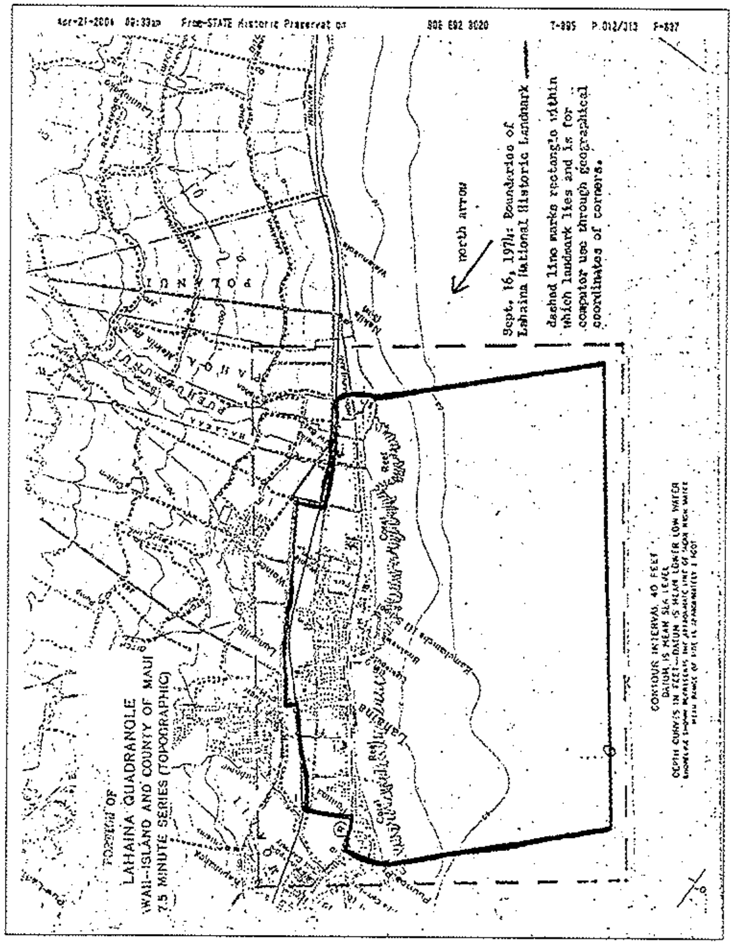

Figure 2. Lahaina Historic District Boundaries (from National Register of Historic Places).

4.0 PREVIOUS ARCHAEOLOGY

Numerous archaeological studies have been conducted in the Lahaina Historic District and surrounding vicinity. The first study was completed in 1965 by Fredericksen and Fredericksen (Fredericksen and Fredericksen 1965). From 1965 to 1996 a total of 21 other studies were conducted (Major and Klieger 1995).

A majority of these 21 reports came about in the 1970's when archaeological research in the area was prevalent. Hommon (1973), Conolly (1974), Joerger and Kaschko (1979) and Ahlo and Morgenstein (1980) all wrote reports on the area formerly known as Mala pier. Major and Klieger in their 1995 report state that the Mala pier area was tested by Aki Sinoto (1975), Davis (1974), and Hammatt (1978). In these studies human Hawaiian burials were discovered on and near the beach on at Mala Pier.

In March of 1975, Paul L. Cleghorn carried out a series of test excavations at the Seamen's Hospital or United States Marine Hospital (site 50-Ma-D5-10) in Lahaina. The purpose of the excavation was to expose portions of the hospitals foundation. During Phase I, the features encountered included a possible old roadway, the foundation of a wall (1819), a mortar slab, a human burial, and 1,229 artifacts. While most of the artifacts were historic period artifacts, some were traditional Hawaiian artifacts (Cleghorn 1975).

During the months of June and July of 1991, Paul H. Rosendahl, Ph.D., Inc. (PHRI) completed a survey of the Lahaina Bypass Section of the Honoapiilani Highway Realignment Project for the Department of Transportation of the State of Hawaii. The inventory survey documented four archaeologically sites, however three of the sites (2484, 2489, and 2490) had previously been recorded. Site 2847 was the newly discovered site. This site is a walled enclosure (Rosendahl 1991).

In 1994, Berdena Burgett and Robert L. Spear completed an archaeological inventory survey of a 8.8 acre parcel in the land of Kainehi, where a single human burial (Site 50-50-03-3550) was identified (Burgett and Spear 1994). No other associated materials, burials, or cultural deposits were found during the archaeological inventory survey.

In 1992 Bishop Museum received a research contract from the County of Maui and administered by the Lahaina Restoration Foundation. The purpose of the research was to focus on the private residence of King Kamehameha III, Moku`ula, an island within the former fishpond, Loko o Mokuhinia (Site 50-03-2967). Klieger, et al. (1995) describe the extensive findings on Moku`ula and its relation to the royal family. Before the project began it was unclear if the location of the King's Palace was correct, but after excavations it was confirmed that the palace did lie under the Malu`ulu o Lele Park and some architectural features still remain. The Moku`ula site was determined to be eligible for listing in the National Register of Historic Places under criteria A, B, and D. Before the Kamehameha dynasty the site was home to *Mō`ī* Pi`ilani, a ruling chief of Maui, Molokai, Lanai, and Kahoolawe bays. A stone tomb on the site housed the remains of the royal family of Maui and the Kamehameha lineage until it was moved to Waine`e Cemetery, some time after Kamehameha III's death in 1854. The palace site was also used for taro production. It is believed that Moku`ula functioned as a residence for the Kamehameha family from late pre-contact to 1837. However, evidence does not suggest the site was the primary home for the Kamehameha family. The collection of artifacts and lack of midden suggest it was only used on occasions. The site was listed on the State Register of Historic Places in 1994 and on the National Register of Historic Places in 1997.

5.0 BEFORE THERE WAS WHALING

The people that were interviewed had many concerns about the proposed improvements to the Lahaina Harbor Area. Emphasized by many of the interviewees was that further development would not just impact the local area, but it would also have systemic repercussions for the surrounding Lahaina area.

5.1 WAINE`E

Akoni Akana, Kalei Tsuha, and representatives from Nā Kūpuna O Maui discussed the linkages of features in the area. Akoni Akana discussed, that culturally, everything in the *ahupua`a* is connected, from the mountain to the sea. He gave the example of Moku`ula (Figure 2) being more than "just Moku`ula," but the connection to the *ali`i* of the *ahupua`a* of Waine`e.

Kalei Tsuha, when asked about the connections of the places in the Lahaina area, conveyed the following:

> Mokuhinia's entrance was not far from the Hauola stone; Kamehameha III's red brick house was built extremely close to the stone. Moku'ula was the *pu'uhonua* and refuge for Kauikeaouli (Kamehameha III) and his residence too. The fish pond was near at Pa Kala. The fishing was great, the *'aumākua* shark and *mo'o* [Kihawahine] resided in the area, Kananaka, the man-eating half shark/half woman resided near the reef between the surf of 'Uo and Keawaiki, the *ali'i* and *maka'āinana* would continue to surf right outside of the Harbor mouth, which is the famous Keawaiki surf and 'Uo surf, the Waine'e church [which was where the *ali'i* prayed and were buried], Luakini street is near the area, fishing *ko'a* (shrine) and *heiau* (temple) were near 505 Front Street and the old Puamana area. Taro patches stretched from Waine'e all the way up to Kaua'ula, Kahili, and Halona Valley, Lahainaluna High School is also within the *ahupua'a*. Canal street was a real canal where folks would paddle their canoes up the stream into Mokuhinia and Moku'ula. Whaling vessels would anchor off of canal to collect the fresh water before they continued on their journey. Pu'upa'upa'u [Mt. Ball] was the fortified battle hill, similar to Ka'uiki Hill in Hāna. David Malo is buried on the top of this hill.

The *ahupua`a* connections did not stop at the shore, but went out into the ocean as well. Akoni Akana, Keeaumoku Kapu, and George Kaimiola named the reef as Kapapalimuāpi`ilani (Figure 1). As the name suggests, this reef was favored by the noted Maui chief Pi`ilani as a place for gathering limu. All of the interviewees stated that it is important to keep the connections of all aspects of the *ahupua`a* in mind when considering the cultural impacts within the project area. Most importantly is the connection of the Hauola stone to Waine`e.

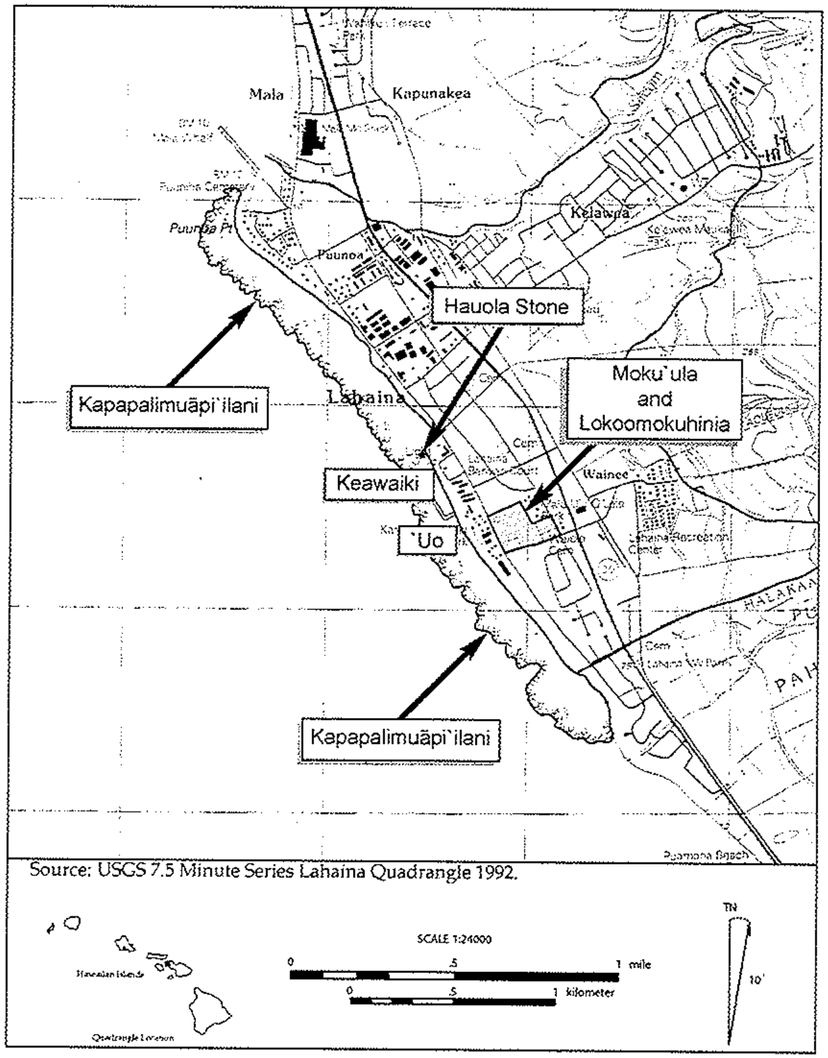

Figure 3. Storied Places in Vicinity of Lahaina Harbor.

5.2 THE HAUOLA STONE

The Hauola stone (Figures 2, 3) is located 57m NW of the Lahaina Harbor lighthouse at the base of the rock wall. According to all of the interviewees, this stone is still in its original place. Akoni Akana and Kalei Tsuha both stated that the stone is much more than a birthing stone, but also a healing stone used to help those who were terminally ill, and the stone was also used as a place for hiding babies' umbilical cords. Pukui (1983) speaks thusly of the Hauola Stone:

> There is a stone in the sea at Lahaina, Maui, called Pōhaku-o-Hauola, where pregnant women went to sit to ensure an easy birth. The umbilical cords of babies were hidden in crevices in the stone. (Pukui 1983: 154)

Members of Nā Kūpuna O Maui stressed the importance of the Hauola Stone, stating that if anything happened to the stone, all of Lahaina would be "wiped out." Ke`eaumoku Kapu also emphasized that if anything were to happen to the stone it would become the "Haumake Stone" [*make* meaning death; the stone would no longer bring life, but death]. He further went on to say, "When shit (*sic*) starts to happen, that's when shit (*sic*) starts to fly. This place is so sensitive that [if] anything was to occur . . . [it] would have major [re]percussions." Akoni Akana conveyed the following when talking about the Hauola Stone. The meaning of the word *hau* is cold, chilly, as in water, but it is also the *hau* tree (*Hibiscus tiliaceus*) which grows abundant in wet areas and brackish water areas near the shore. *Hau* is used for medicine, *ama* (outrigger float), and for making cordage. Thus, *hau* can be used for cordage or cord. The *kaona* (concealed reference) of the cord is that the cord is representative of the *piko* (umbilical cord, an attachment to a greater whole, e.g. one's ancestors or descendants). The Hauola stone could be seen as the connection to life or health.

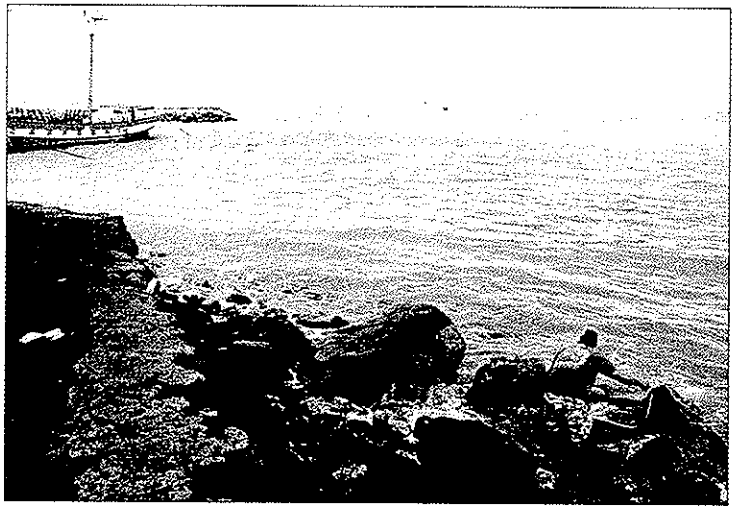

Figure 4. Hauola Stone at Low Tide.

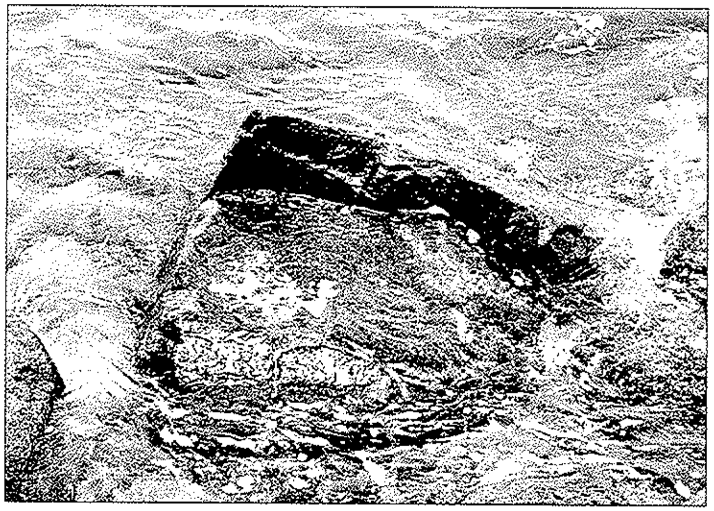

Figure 5. Hauola Stone at High Tide.

In an email transmission Kalei further explained *hau* in the following manner:

> *Hau* also means to be laid out or lay before; as an offering; or to offer a sacrifice or prayer. I believe that Hauloa meant that it was a place that folks offered prayers or sacrifices for healing while laying upon the stone. Perhaps the one who needed the treatment was laid out [*hau*] for healing [*ola*].

Akoni Akana and Kalei Tsuha both spoke about the commingling of the *kai* (seawater) and the *wai* (freshwater) being areas used for purification, cleansing, healing, and ceremony. According to Akoni Akana all of the waters, including the rain, from this area are sacred. The name of the rain is Ka`alani and it comes in from the ocean. It is not a drenching rain, but it passes through the area and one can see it move.

Kalei Tsuha goes on to talk further about the importance of the ocean in the Hawaiian culture:

> The ocean is seen in the Hawaiian culture as a place of refuge. It's a place that one retreats to for healing, cleansing, purging, and help. It's a place that reminds us of the nine months that (we) resided in our mother's womb; a place of security, of protection, and of nurturing. It is natural for a Hawaiian to sit in a place, such as the Hauola stone, for spiritual, mental and physical health and well being. *Kapu kai* and *Hi`uwai* were both important for the healing and the cleansing of illness and disease. The Hauola stone is a reminder of all those who've come before for healing, and of those who still utilize it today, and we hope (it) will still be there for future generations .

Akoni Akana, Charles Lindsey, George Kaimiola, and Kalei Tsuha spoke of the stone as still being used today. Charles Lindsey recalls seeing people going down to the stone when he was growing up. Kalei Tsuha knew of people still visiting the rock, but they are likely visiting during early morning or late evening hours when there will be little or no spectators. Akoni Akana, himself has used the stone in recent times. An old friend was terminally ill so Akoni and some of his friends took him down to the stone to help ease his passing.

Akoni Akana recalled that the last known birth at the stone was ca. 1920. This information was relayed to him by Ned Lindsey. Ned Lindsey's aunt was a midwife and she assisted in the birth.

5.3 Surf and Fishing

Akoni Akana, Ke`eaumoku Kapu, George Kaimiola, Charles Lindsey, and Kalei Tsuha spoke of the surf at Lahaina Harbor. The surfing spots were known as Keawaiki, located right outside of the Lahaina Harbor entrance, and `Uo, located just to the south of Keawaiki (Figure 1).

George Kaimiola related that surfing is the sport of Hawaii's kings, and, that at times, the surf was so nice that the people would sit back and watch Kanaloa (one of the primary Hawaiian deities) surf.

People are still surfing at Keawaiki and `Uo today (Figure 4) Ke`eaumoku Kapu has concerns that further development of the Lahaina Harbor area would push the surfers further down to the areas abundant with *wana* (sea urchins).

Charles Lindsey and Kalei Tsuha both recalled seeing the shoreline lined with *akule* (*Trachurops crumenophthalmus*) and *`ōpelu* (*Decapterus pinnulatus*) boats before the harbor was built. The area was known for *`ama`ama* (*Mugil cephalus*), *moi* (*Polydactylus sexfilis*), *kūmū* (*Upuneus porphyreus*), *kūpīpī* (*Abudefduf sordidus*), *āholehole* (*Kuhlia sandvicensis*), *manini* (*Acanthurus sandvicensis*), *uouoa* (*Neomyxus chaptalii*), and *he`e* (*Polypus* sp). Kalei Tsuha's grandmother gathered *he`e* in the area. There are stories of her grandmother going down to the shore, calling the fish and gathering them up in her *mu`umu`u* (dress). Some of the fishing grounds were destroyed during the dredging for the original harbor (Figure 6).

Charles Lindsey recalled his grandfather taking care of a shark *`aumakua* just south of Lahaina at a placed called `Ūhā`ilio (*lit.* dog's lap). It is a dogleg-shaped inlet where a shark *`aumakua* resided. His grandfather would put out offerings to the shark, go out fishing at night, and, in no time, return with his canoe full of fish. Charles' grandfather passed the task of taking care of the shark to Charles' uncle, but his uncle moved away from the area and there is no one from his family tending the shark now.

Figure 6. The Surf at Keawaiki.

5.4 Further Concerns

Many of the interviewees felt that much of what is important to the Hawaiian Culture, especially in Lahaina, has been pushed aside to make way for tourists and their money. Kalei Tsuha asserts that the vicinity of the Hauola Stone is the last bit of land that is Hawaiian in Lahaina. Ke`eaumoku Kapu pointed out the location of Kamehameha's taro patch, the *heiau* (temple), and Kamehameha's brick palace, and how they have been swept aside to accommodate those things that are not Hawaiian. Kalei Tsuha's father can no longer stand to walk down Front Street, it saddens him.

George Kaimiola gives cultural tours to the people disembarking the cruise liners and their tenders (Figures 7 & 8). While he admits that he does make money off of the tourists, he will not sacrifice his culture to make money. He feels that making the island more accessible to tourists will inevitably lead to tourists buying up all the land that they see for sale, making the island less accessible to the local population. The *Kanaka Maoli* connection to the land will be severed because the sale of land to foreigners will make it no longer possible to visit culturally important areas. Concerns were raised about disturbing the Hauola Stone. It is still in its original position and anything that negatively impacts the Hauola Stone will have dire consequences on the whole of Lahaina.

Fishing and surfing are carried out in the waters of Waine`e. Surfing is often times dangerous because the break is in the vicinity of the harbor entrance and boat traffic.

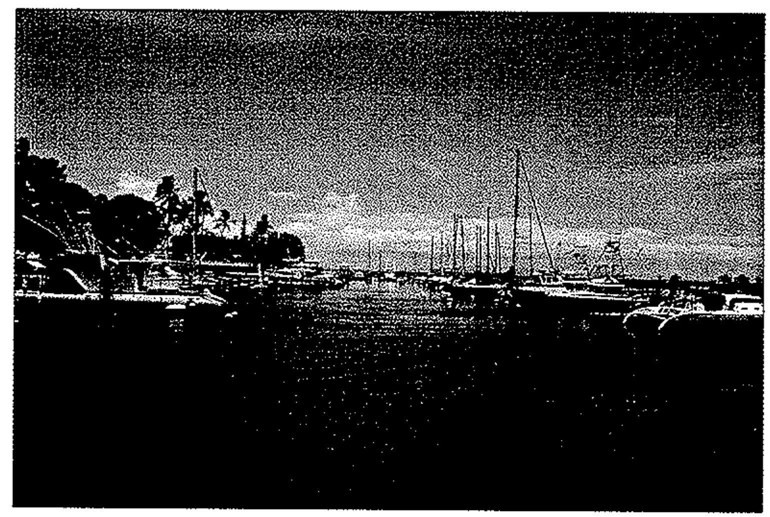

Figure 7. Lahaina Harbor.

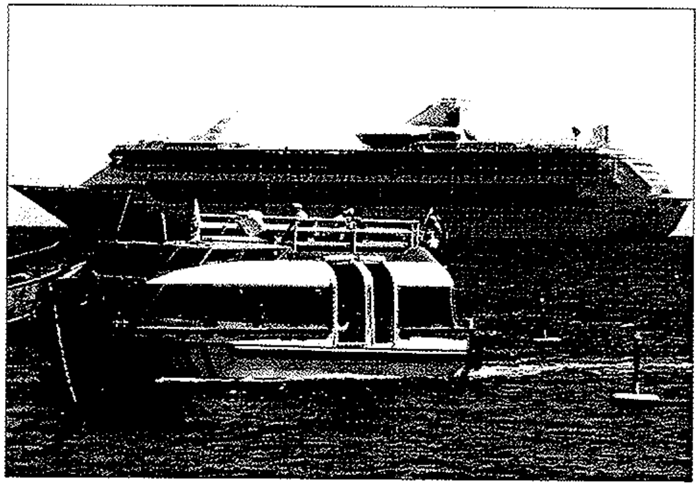

Figure 8. A Cruise Ship Anchors Offshore While it's Tenders Ferry Passengers to Dock.

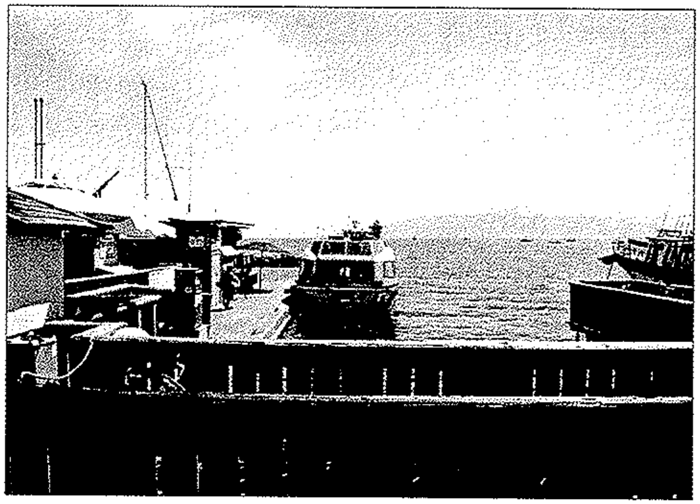

Figure 9. Cruise Ship Tender at Dock.

6.0 SUMMARY AND DISCUSSION

This report has presented the results of the archaeological assessment and cultural impact assessment for the Lahaina Pier Improvement Project in Lahaina, Maui. The Lahaina Pier Improvement Project is being proposed by the State Department of Land and Natural Resources - Division of Boating and Ocean Recreation, and consists of building a new ferry pier, and possibly widening and deepening the entrance channel to the harbor. The purpose of these assessments were to determine the history of land use in this portion of Lahaina, if any archaeological sites have been recorded in the vicinity of the proposed project and if the present cultural resources were still being used in traditional Hawaiian practices. The research was conducted through archival research at the State Historic Preservation Division (SHPD) library and the State Library and Archives and through information gathered during interviews with people knowledgeable about the area known as Lahaina today. The people contacted for interviews were either from Lahaina or cultural practitioners in Lahaina.

From the research gathered all of the sites listed on the Lahaina Historic District nomination form have been found on the *mauka* side of Wharf Street across from the proposed development area. These sites include the Baldwin House, the Old Spring house, the Court House, the Old Prison, Wanie`e Church and Cemetery, Hale Aloha, United States Marine Hospital and the Roman Catholic Church. These sites were listed on the National Register of Historic Places in 1970 as the Lahaina Historic District, Site 50-03-3001 and include approximately 60 other sites (SHPD), however the State Historic Preservation Department only has records for a few of the contributing sites. None of the sites listed on the Lahaina Historic District Nomination Form will be affected and there is a low potential of encountering cultural resources.

The results of the archaeological assessment show the Lahaina Historic District includes several pre-contact sites and numerous historic sites. Two of these sites, the Hau`ola Stone (Site 50-50-03-1202) and King Kamehameha I's Palace Site (Site 50-50-03-2951), are in the immediate vicinity of the proposed project area. There is also the site of a previous heiau adjacent to the proposed project area.

While assessing the cultural impact of such a project, one must not just look at the single point where construction would take place. The interviewees made it very clear that one must look at the area as a whole, not a part. What happens in part of the *ahupua`a* affects the whole of the *ahupua`a*.

Many of the interviewees felt that large expansion improvements were unnecessary, due to the fact that the Carthaginian II was planned for removal, and the number of empty slips along the breakwater that could be improved to receive tenders. Further dredging activities are not recommended as they would come to close to the Hauola Stone and could also negatively impact the surf at Keawaiki.

Charles Lindsey captured the sentiment of the people interviewed for this project when he said, "This place was known before whaling times as a Hawaiian Cultural place…where people surfed, where people went for healing, where people *mālama*'ed the place."

7.0 RECOMMENDATIONS

The results of this archaeological assessment suggest that there is a low potential of affecting any of the listed historical sites in the Lahaina Historic District. The Lahaina Historic District is listed as a National Historic Landmark and on the National and State Register of Historic Places because it maintains the atmosphere of a Hawaiian seaport and port of call for American whalers. None of the proposed improvements will take away from the atmosphere mentioned above.

Extreme care is highly recommended near the Hau`ola Stone (Site 50-50-03-1202) and King Kamehameha I's Palace Site (Site 50-50-03-2951), because they are sites in the immediate vicinity of the proposed project area. The Hau`ola Stone is still used by Native Hawaiians for its healing properties (Cleghorn and Kailihiwa, 2004) and the project has the potential to impact the stone and its cultural properties. Interviewees of the CIA advised that any improvement activities for the Lahaina Pier improvements be as non-invasive as possible.

It does not appear that construction will affect any archaeological resources listed on the Lahaina Historic District Nomination Form and no further archaeological investigations are recommended. However, if any archaeological resources, such as human remains, are found during construction, work should cease immediately and the Historic Preservation Division should be contacted, Melissa Kirkendall at (808) 243-5169.

8.0 SIGNIFICANCE

The National Historic Preservation Act of 1966 (as amended) authorizes the Secretary of Interior to expand and maintain a National Register of Historic Places (NRHP) that contains a listing of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, engineering and culture. A property may be listed in the NRHP if it meets criteria for evaluation defined at 36 CFR §60.4:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

The State of Hawaii recognizes the above criteria under HRS §13-275-6, and has also added a fifth significance criterion to the evaluation process:

> e) That have an important value to the Native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts -- these associations being important to the group's history and cultural identity.

Based on the above criteria and the results of the archaeological investigations, it appears that site 50-50-03-1202 Hauola Stone, has the potential to be registered under criteria e. The Hauola Stone is still used by Native Hawaiians for cultural practices and associated with traditional beliefs of healing and wellness.

9.0 REFERENCES

Ahlo, Hamilton, and Maurice Morgenstein
1980 Archaeological Testing and Excavations Near the Mouth of Kahoma Stream, Lahaina, Maui. On file at the State Historic Preservation library. Kapolei.

Barrera, William, Jr., and Patrick V. Kirch
1989 Honoapiilani Highway, Maui: Archaeological Reconnaissance. Prepared for Environmental Communications, Inc., Honolulu. On file at the State Historic Preservation Library, Kapolei.

Bartholomew, Gail and Bren Bailey
1994 *Maui Remembers: A Local History*. Mutual Publishing, Honolulu, Hawaii.

Burgett, Berdena and Robert L. Spear
1994 An Archaeological Inventory Survey of a 8.8 Acre Parcel in the Land of Kainehi, District of Lahaina, Paunau Ahupua`a, Island of Maui [TMK: 4-5-03: 12,13,15,38,39, and 40]. On file at the State Historic Preservation library. Kapolei.

Cleghorn, Paul L.
1975 Phase I Archaeological Research at the Seamen's Hospital (Site D5-10), Lahaina, Maui. On file at the State Historic Preservation library. Kapolei.

Connolly, R.D.
1974 Phase I Archaeological Survey of Kahoma Stream Flood Control Project, Maui. On file at the State Historic Preservation library. Kapolei.

Community Planning Inc.
1961 Proposal for the Historical Restoration and Preservation of Lahaina, Island of Maui, State of Hawaii. On file at the State Historic Preservation library. Kapolei.

Davis, Bert
1974 Preliminary Report, Mala Wharf Burials, Phase I, Mala, Lahaina, Maui Island. On file at the State Historic Preservation library. Kapolei.

Day, Grove A.
1984 *A Biographical Dictionary: History Makers of Hawaii*. Mutual Publishing of Honolulu. Honolulu.

Fredericksen, Walter M., Demaris L. Fredericksen, and Erik M. Fredericksen
1988 The Aus Site: H.S. #50-03-1797, A Preliminary Archaeological Inventory Survey Report. On file at the State Historic Preservation library. Kapolei.

Fredericksen, W., and D. Fredericksen
1965 Report on the Archaeological Excavation of the "Brick Palace of King

Kamehameha I at Lahaina, Maui, Hawaii [TMK 4-6-01: 7]. On file at the State Historic Preservation library. Kapolei.

Hammatt, Hallett
1978 Archaeological Investigation and Monitoring, Mala Wharf Boat-Launch Ramp Area, Lahaina, Maui. On file at the State Historic Preservation library. Kapolei.

Hommon, Robert
1973 Report of a Walk-Through Survey of Kahoma Stream Flood C0ontrol Project Area. On file at the State Historic Preservation library. Kapolei.

James, Van
2001 *Ancient Sites of Maui, Moloka`i, and Lāna`i: Archaeological Places of Interest in the Hawaiian Islands*. Mutual Publishing of Honolulu.

Joerger, Pauline, and Michael Kaschko
1979 A Cultural History Overview of the Kahoma Stream Flood Control Project, Lahaina, Maui, and Ma`alaea Small Boat Harbor Project, Maalaea, Maui, Hawaii. On file at the State Historic Preservation library. Kapolei.

Juvik, Sonia P. and James O. Juvik
1998 *Atlas of Hawai`i, Third Edition*. University of Hawai`i Press, Honolulu, HI.

Klieger, P. C. (Ed.), B. Dixon, S. A. Lebo, H. Lennstrom, D. Gosser, and S. D. Clark
1995 Moku`ula: History and Archaeological Excavations at the Private Palace of King Kamehameha III in Lahaina, Maui. On file at the State Historic Preservation library. Kapolei.

Major, Maurice and P. Christiaan Klieger
1995 Historical Background and Archaeological Testing at Pikanele's Kuleana in Lahaina, Maui: An Inventory Survey Report of LCA 310.3 (Royal Patent 1729.2, TMK [2] 4-6-07: 13. On file at the State Historic Preservation library. Kapolei.

Maui Historical Society
1961 *Lahaina Historical Guide*. Star-Bulletin Printing Company, Honolulu, HI.

McGerty, Leann, and Robert S. Spear
2003 A Cultural Impact Assessment on a Piece of Property Located in Kan`anapali, Hanaka`ō`ō Ahupua`a, Lahaina District, Maui Island, Hawaii [TMK: 4-4-06: 56]. On file at the State Historic Preservation library. Kapolei.

Monahan, Christopher M,
2003 An Archaeological Assessment Report on 17.746 Acres of Land (Lahaina Business Park, Phase II) on an Undeveloped Lot in Lahaina, Moali`i Ahupua`a, Lahaina District, Maui Island, Hawaii [TMK: 4-5-10: 007]. On file at the State Historic Preservation library. Kapolei.

National Historic Landmark

Nd National Historic Landmarks webpage, Lahaina Historic District. http://tps.cr.nps.gov/nhl/detail.cfm.

National Register of Historic Places
1970 Nomination Form for National Register of Historic Places. Completed in 1970 by Lynn H. Thompson. Placed on the register 1970. Available at the State Historic Preservation Division, Hawaii.

Pukui, M. K., S. H. Elbert, and E. T. Mookini
1976 *Place Names in Hawaii*. University Press of Hawaii. Honolulu.

Rosendahl, Paul H.
1991 Archaeological Inventory Survey Honoapiilani Highway realignment Project Lahaina Bypass Section- Modified Corridor Alignment: Lands of Honokowai, Hanakaoo, Waihikuli, Panaewa, Kuia, Halakaa, Puehuehunui, Pahoa, Polanui, and Launiupoko, Lahaina District, Island of Maui. On file at the State Historic Preservation library. Kapolei.

Sato, H.H., W. Ikeda, R. Paeth, R. Smythe, M. Takehiro
1973 *Soil Survey of the Island of Hawaii, State of Hawaii*. United States Department of Agriculture. Washington D.C.

Sinoto, A.
1975 An Archaeological Reconnaissance of the Mala Wharf Boat-Launch Ramp Area, Lahaina, Maui. On file at the State Historic Preservation library. Kapolei.

State Historic Preservation Division
2004 GIS, Global Information System. Used May 5, 2004.

Sterling, Elspeth P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu, Hawaii.

Wilson, Christie
2002 Carthaginian II to be scuttled. Honolulu Advertiser.com, Posted on: Wednesday 2 2002. Honolulu Advertiser, Honolulu, Hawaii. http://the.honoluluadvertiser.com/article/2002/Oct/02/ln/ln21a.html.

APPENDIX A

NATIONAL REGISTER OF HISTORIC PLACES
LAHAINA HISTORIC DISTRICT

Apr-21-2004 09:26am From-STATE Historic Preservation 808 692 8020 T-895 P.001 F-637

Form 10-300 (July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: Hawaii
COUNTY: Maui
FOR NPS USE ONLY
ENTRY NUMBER | DATE

1. NAME
COMMON: Lahaina
AND/OR HISTORIC: Lahaina Historic District

2. LOCATION
STREET AND NUMBER:
CITY OR TOWN: Lahaina
STATE: Hawaii CODE COUNTY: Maui CODE

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP	STATUS	ACCESSIBLE TO THE PUBLIC
☒ District ☐ Building ☐ Site ☐ Structure ☐ Object	☐ Public ☐ Private ☒ Both; Public Acquisition: (partial) ☒ In Process ☐ Being Considered	☐ Occupied ☐ Unoccupied ☒ Preservation work in progress	Yes: ☐ Restricted ☒ Unrestricted ☐ No

PRESENT USE (Check One or More as Appropriate):
☐ Agricultural ☒ Commercial ☒ Educational ☐ Entertainment ☐ Government ☐ Industrial ☐ Military ☒ Museum ☒ Park ☐ Private Residence ☒ Religious ☐ Scientific ☐ Transportation ☐ Other (Specify) ☐ Comments

4. OWNER OF PROPERTY
OWNER'S NAME: Multiple ownership
STREET AND NUMBER:
CITY OR TOWN: STATE: CODE

5. LOCATION OF LEGAL DESCRIPTION
COURTHOUSE, REGISTRY OF DEEDS, ETC.: Maui County Courthouse
STREET AND NUMBER:
CITY OR TOWN: Wailuku STATE: Hawaii CODE

6. REPRESENTATION IN EXISTING SURVEYS
TITLE OF SURVEY: Town of Lahaina Map
DATE OF SURVEY: 1894 ☒ Federal ☐ State ☐ County ☐ Local
DEPOSITORY FOR SURVEY RECORDS: Survey Division, State of Hawaii
CITY OR TOWN: Honolulu STATE: Hawaii CODE

STATE: COUNTY: FOR NPS USE ONLY ENTRY NUMBER DATE

12/28/62 NPS designate NL.
∴ Boundaries established by NPS

Apr-21-2004 09:27am From-STATE Historic Preservation 808 692 8020 T-895 P.002

7. DESCRIPTION

CONDITION: (Check One) ☒ Excellent ☐ Good ☐ Fair ☐ Deteriorated ☐ Ruins ☐ Unexposed
(Check One) ☒ Altered ☐ Unaltered
(Check One) ☐ Moved ☒ Original Site

DESCRIBE THE PRESENT AND ORIGINAL (if known) PHYSICAL APPEARANCE

Steady progress, albeit somewhat slow due to state and county commitments, is being made by the Lahaina Restoration Foundation and the Maui Historic Commission. Work on restoration of the Seaman's Hospital has been started. Foundations of the King's home have been exposed and are being interpreted by signs on the plexiglass shields covering the excavations.

The district still contains a number of incompatible structures but interest in the area has grown and successful battles have been fought to keep a high-rise structure off the main waterfront.

SEE INSTRUCTIONS

8. SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

☐ Pre-Columbian! ☐ 16th Century ☐ 18th Century ☐ 20th Century
☐ 15th Century ☐ 17th Century ☒ 19th Century

SPECIFIC DATE(S) (If Applicable and Known)

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

Aboriginal	☒ Education	☒ Political	☐ Urban Planning
☐ Prehistoric	☐ Engineering	☒ Religion/Philosophy	☐ Other (Specify)
☐ Historic	☐ Industry	☐ Science	
☐ Agriculture	☐ Invention	☐ Sculpture	
☐ Architecture	☐ Landscape Architecture	☐ Social/Humanitarian	
☐ Art	☐ Literature	☐ Theater	
☒ Commerce	☐ Military	☐ Transportation	
☐ Communications	☒ Music		
☐ Conservation			

STATEMENT OF SIGNIFICANCE

(See original submission)

SEE INSTRUCTIONS

9. MAJOR BIBLIOGRAPHICAL REFERENCES

(See original submission)

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY

CORNER	LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
NW	21°	'	"	157°	'	"
NE	21°	'	"	156°	'	"
SE	20°	'	"	156°	'	"
SW	20°	'	"	157°	'	"

OR

LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
°	'	"	°	'	"

APPROXIMATE ACREAGE OF NOMINATED PROPERTY:

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

11. FORM PREPARED BY

NAME AND TITLE: Lynn H. Thompson, Superintendent

ORGANIZATION: Haleakala National Park — DATE: 09/03/70

STREET AND NUMBER: P. O. Box 456

CITY OR TOWN: Kahului, Maui — STATE: Hawaii 96732 — CODE

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☐ Local ☐

Name (already included)

Title

Date

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Chief, Office of Archeology and Historic Preservation

Date

ATTEST:

Keeper of The National Register

Date

SEE INSTRUCTIONS

APPENDIX B

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS SUPPLEMENTARY SHEETS
(ATTACHED TO THE NATIONAL REGISTER OF HISTORIC PLACES NOMINATION FORM, LAHAINA HISTORIC DISTRICT)

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS

1. STATE: Hawaii

2. THEME(S): Theme XXX. Special Study - Hawaii History

3. NAME(S) OF SITE: Lahaina (About 33 acres are recommended as historic district by private consultants, plus site of Marine Hospital)

4. APPROX. ACREAGE: 33 acres

5. EXACT LOCATION: Lahaina is a town on the west coast of the island of Maui.

6. NAME AND ADDRESS OF PRESENT OWNER: The property within the proposed historic district is owned by a number of public agencies, organizations, and private corporations and individuals (see discussions of individual sites below). However, the Court House Square, a logical place to erect a landmark plaque, is owned by the State of Hawaii, and is administered, evidently, by the Department of Accounting and General Services, Division of Public Works, State Office Building, 465 South King Street, Honolulu 13, Hawaii.

7. Importance and Description.

Significance: Perhaps no island town so well preserves the atmosphere of a mid-19th century Hawaiian seaport as does Lahaina; and thus it seems to be the key site for illustrating and commemorating one of the broad factors which resulted in the Americanization of Hawaii and which helped lead eventually to the annexation of the islands by the United States -- the whaling industry. From about 1830 to about 1860 the semi-annual visits of the American whaling fleet to Lahaina and other Hawaiian ports constituted the dominant force in island economy, stimulating a diversified agriculture and a general trade which helped spread Western technology among the Hawaiian people. Also, the thirsting of thousands of seamen for liquor and women resulted in annual struggles with the authorities attempting to enforce the missionary induced "blue laws," a long campaign which the forces of law and order eventually won, with important effects upon the social and political conditions in the islands. The vital and long-continued need of the whalers for bases in the islands was one of the primary factors bringing Hawaii to the attention of the United States Government. In addition, Lahaina was the royal residence and capital during much of the critical period when Hawaii was changing from a feudal autocracy to a constitutional monarchy, and it was associated with many of the key events of that transition.

According to tradition, Lahaina was from time immemorial a favorite residence of Maui kings and chiefs and a convenient port for inter-island travelers. The powerful Kahekili, ruler of all the islands except Hawaii, lived here until his death in 1794;

8. BIBLIOGRAPHICAL REFERENCES: Mary Charlotte Alexander, Dr. Baldwin of Lahaina (Berkeley, Calif., 1953); Maui Historical Society, "Historical Sites of West Maui" (mimeographed, [n.p.], May 20, 1958); Maui Historical Society, Lahaina Historical Guide (Honolulu, [n.d.]); Albert Pierce Taylor, "Lahaina: the Versailles of Old Hawaii," in Thirty-Seventh Annual Report of the Hawaiian Historical Society . . . 1928 (Honolulu, 1929), 34-65.

9. REPORTS AND STUDIES: Community Planning, Inc., Proposal for the Historical Restoration and Preservation of Lahaina . . . (Honolulu, May, 1961); State of Hawaii, Commission on Historical Sites, Mrs. Beatrice Savage, compiler, "Historical Sites on Maui Which Should Be Preserved" (typewritten, Feb. 1, 1960).

10. PHOTOGRAPHS	11. CONDITION	12. PRESENT USE	13. DATE OF VISIT
ATTACHED: YES ☒ NO ☐	Poor to excellent	Various	April 19, 21, 1962
14. NAME OF RECORDER		15. TITLE	16. DATE
John A. Hussey		Regional Historian	July 17, 1962

(IF ADDITIONAL SPACE IS NEEDED USE SUPPLEMENTARY SHEET, 10-317a, AND REFER TO ITEM NUMBER)

NATIONAL P...

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

This sheet is to be used for giving additional information or comments, for more space for any item on the regular form, and for recording pertinent data from future studies, visitations, etc. Be brief, but use as many Supplement Sheets as necessary. When items are continued they should be listed, if possible, in numerical order of the items. All information given should be headed by the item number, its name, and the word (cont'd), as, 6. Description and Importance (cont'd) . . .

STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

and Kamehameha the Great landed here to begin his final conquest of Maui. By that time the port had become a well-known point of call for trading and exploring vessels, whose captains found the open roadstead a safe and convenient anchorage. For a couple of decades after 1812 it was an important shipping point for the sandalwood trade.

A new era of prominence and activity for Lahaina began in December, 1819, when Kamehameha II moved his residence here for several months. From then until 1843 Lahaina was a frequent, though not continuous, royal residence and capital. In 1819, also, the first American whaling ships reached the islands, and by 1822 there were 34 whalers making Hawaii a base of refreshment. From that time the number increased rapidly. Although Honolulu was originally the port most favored by the whalers, Lahaina often surpassed it in the number of recorded visits, particularly from about 1840 to 1855. Another event which was to have much effect upon the growth and social structure of Lahaina was the arrival of the first missionaries in the islands during 1820. The first missionaries to become established at Lahaina, the Rev. C. S. Stewart and the Rev. William Richards, arrived in 1823 accompanied by Queen Mother Keopuolani. These three factors -- political prominence, visits of whaling ships, and the development of a particularly influential mission under the protection of some of the most powerful chiefs of the land, resulted, as one writer has somewhat exuberantly said, in starting Lahaina "off to a historical romp that probably will never be equalled."

The great event of 1823 was the death of Keopuolani at Lahaina. Within an hour before "join the Great Majority" she had been baptized as a Christian, an occurrence which proved a great stimulus to increasing the influence of the missionaries. King Kaumualii of Kauai was, at his special request, buried beside Keopuolani in 1824. The bodies of Kamehameha II and his queen were brought back from London in 1825 and interred at Lahaina until they were later moved to the royal tomb in Honolulu. When Kamehameha III ascended the throne, he settled upon Lahaina as his home and seat of government.

Meanwhile, the missionaries were making rapid advances, drawing thousands of Hawaiians to worship and persuading the chiefs, especially the able governor of Maui, Chief Hoapili, to institute regulations against the sale of liquor and against visits to ships by island women. These restrictions were considered too rigorous by the "sea-bittered" sailors who swarmed ashore seeking pleasure, and in 1825 the crew of the English whaler Daniel rioted through the town for three days, twice threatening the lives of the Rev. Richards and his wife. Two years later the crew of another English whaler, the John Palmer, actually fired their cannons at the Richards house to force

NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
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STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

the release of their American captain who had been detained by the authorities in an effort to obtain the return of four "base women" who had been illegally enticed aboard the vessel. These difficulties with unruly seamen lasted as long as Lahaina remained a whaling port, but the Hawaiians, by controlling liquor and enforcing curfews, maintained the upper hand, and Lahaina was known as a more orderly port than Honolulu. Even so, one minister in the late 1840's described the town as "one of the breathing-holes of hell."

Lahaina, as the island capital, was associated with many of the most important political developments in the kingdom during the reigns of Kamehameha II and Kamehameha III. Here Kaahumanu, Queen Regent, promulgated the famous laws based on the Ten Commandments. Here the first Hawaiian Legislature met in 1840, and the first written constitution was promulgated at Lahaina during the same year. Since much of this evolution from feudalism was undertaken with the advice of the Rev. Mr. Richards, it perhaps is not too much of an exaggeration to say that Lahaina at this time was "the cradle of Hawaiian democracy." But after the seizure of the islands by the British during 1843, it was decided that the capital should be at Honolulu, and Lahaina was relegated to the position of an occasional royal residence.

Lahaina was at the height of its prosperity as a whaling port about 1846, at which time about 400 ships a year visited the town to replenish their water and supplies. In that year the population of Lahaina numbered 3,557 persons, of whom 212 were foreigners. There were 1056 houses, mostly strung out along the kukui-shaded main street, 10 schools, a seamen's chapel, 1 main church with 5 or 6 district churches, and a number of public buildings. "About 500 native families," it was reported, "eat at the table in the style of civilization."

By 1862 the whaling industry was in a definite and permanent decline. The effect on Lahaina was marked. Prosperity ended, prices fell, cattle and crops were a drug on the market, and ship chandleries and retail stores began to wither. The town subsided to a lower level of economic importance, and life revolved around the sugar mill, later known as the Pioneer Mill Company, which was established about 1860-1861, and around several other mills and plantations which sprang up from time to time in the vicinity. By 1885, when Charles Warren Stoddard visited Lahaina, the town was "a charming, drowsy and dreamy village."

The principal historic structures and sites still visible include the following:

Apr-21-2004 09:28am From-STATE Historic Preservation 808 692 8020 T-885 P 007/313 F-637

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

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STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

1. Baldwin House. This handsome two-story home, built of coral blocks, with a two-story wing, is located on Front Street at Dickenson Street; it and the 42360-square-foot lot on which it stands are owned by the H. P. Baldwin Estate.

The missionaries at Lahaina were given a tract of land for residence purposes by the local nobility in 1823, and the Rev. William Richards moved into a two-story stone dwelling (since destroyed) there in 1827. In 1832 Ephriam and Julia Spaulding arrived in Lahaina to join the mission staff, and in 1834 Spaulding started construction of the main section and "cook house" of the present Baldwin House adjoining the Richards dwelling. Completed early in 1835, the house was occupied by the Spauldings until 1836, when they left Lahaina due to poor health. Dr. Dwight Baldwin and his family moved into the house when the Spauldings left and occupied it until Dr. Baldwin was transferred to Honolulu in 1868 (some sources say the Baldwins lived in the house until 1871). During this long occupancy the structure became known as the "Baldwin House."

Dr. Baldwin, in addition to serving as pastor of the Hawaiian church at Lahaina and, for a time, as seamen's chaplain, was a medical doctor; and he was government physician for the islands of Maui, Molokai, and Lanai. It was his duty to greet visitors to the Lahaina mission and the nearby Lahainaluna Seminary; and guests were thus frequent. He renovated the structure extensively in 1847-1849 and added the right wing as a dispensary and office.

Dr. Baldwin's son, Henry P. Baldwin, was born in this house and later acquired extensive interests on the Island of Maui. The house has remained in the Baldwin family to the present time. It served an important part in Hawaiian social and cultural development when Mrs. Henry P. Baldwin sponsored a community center there which included a kindergarten, night-school, circulating library, language school, and high school. Used until lately as a community center, clinic, and Girl Scout headquarters, it now (April, 1962) appears to be closed but is kept in excellent condition. It is one of the oldest and best preserved missionary dwellings.

2. Old Spring House. Located 200 feet south of the Baldwin House and set well back from Front Street at the rear of a later frame structure, this small stone building is privately owned.

It is said to have been built by the Rev. William Richards in 1823 to enclose a spring to supply water not only for his own dwelling nearby but for the entire community and for ships anchored off the town. According to local tradition, a hand

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Apr-21-2004 09:30am From-STATE Historic Preservation 808 692 8020 T-885 P 008/313 F-637

NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

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STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

pump here was visited by crews of sailors who "constantly rolled huge casks for water." The Spring House apparently is thus one of the few remaining physical links with the whaling era.

3. Court House. This solid, two-story stone building stands on Wharf Street, in the 1.94-acre square bounded by Wharf, Hotel, Front, and Canal Streets; it is owned by the State of Hawaii.

In 1858 a violent windstorm damaged the governor's house and the Hale Piula, the former palace which housed the government offices. A survey early in that year resulted in a recommendation that a new building to house the customs offices and courts should be built on the site of the old stone fort. Funds were appropriated for the "Lahaina Court and Custom House and Government Offices," and the new building was reported as nearly complete by December, 1859. In addition to the offices mentioned above, it contained the governor's office, post office, and "a room in which to starve the jury into unanimity." The building was extensively rebuilt in 1925, with a considerable change in its appearance. The basic structure remains, however. Still housing about the same types of offices as when it was first erected, it serves as a link with the days of the kingdom. The Court House Square is famed today for its banyan tree, planted by the sheriff of Lahaina in 1873 and proclaimed today as "Hawaii's largest."

4. Old Prison (Hale Paahao). This one-story jailhouse, built of heavy planks, stands at the corner of Wainee Street and Prison Road in grounds 0.82 acre in extent surrounded by a high wall of coral blocks. It is owned by the County of Maui.

In addition to ordinary criminals, the authorities at Lahaina generally had on their hands a number of boisterous seamen who had run afoul of the law in one way or another during their periods of "refreshment" ashore. During the 1830's and 1840's prisoners usually were confined in the fort which stood on the seaward side of the present square. The most common cause of incarceration was failure to obey the sun-down curfew. Liberty expired with the setting of the sun when, said one visitor during the 1840's, the sailors, drunk or sober, "must be off to their ships, or into the fort," and he painted a vivid picture of the reeling seamen hustling along to the shore "caressed and hung upon by native girls, who flock here in the ship season, from other parts, to get the ready wages of sin."

In 1851 the fort physician complained that conditions for prisoners were unhealthful, and evidently as a result construction of a new prison was started in 1852.

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DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

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STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

The main cell block, built of planks, was constructed in that year, but the wall around the grounds, built of coral blocks from the old fort, was not erected until about 1854. Prisoners performed much of the labor. The original cell house burned in 1958; and it and the wooden gate house were reconstructed in 1959 and now present a fine appearance. The prison is open to the public as an historical exhibit.

5. Wainee Church and Cemetery (Waiola Cemetery and Church). The present church structure (1953) and the old cemetery occupy a tract of 2.45 acres on Wainee Street, between Chapel and Shaw Streets. The property is owned by the Waiola Protestant Church.

For several years after the American Board missionaries reached Lahaina in 1823, services were held in temporary structures. In 1828 the chiefs, led by Hoapili, proposed to build a new stone church, and the present site was selected. The cornerstone was laid on September 14, 1828, for this "first stone meeting-house built at the Islands." Dedicated on March 4, 1832, this large, two-story, galleried Wainee Church was twice destroyed by Kauaula winds and once, in 1894, by a fire of incendiary origin. The present church structure was dedicated in 1953, at which time the name was changed to Waiola.

The adjoining cemetery is said to date from 1823. It contains the body of Keopuolani, wife of Kamehameha the Great and mother of Kamehameha II and Kamehameha III. She was largely responsible for the overthrow of the kapu system, and her early interest in Christianity was of much assistance in the founding of the Protestant missions. She is said to have been the first convert of the missionaries in the islands. Other prominent Hawaiian nobles interred here include Governor Hoapili, King Kaumualii, Princess Nahienaena, Queen Kalakua, and Governess Liliha. Here too is buried the Rev. William Richards, the pioneer missionary and advisor to the Hawaiian monarchy. Seeing his grave near that of the nobles, a visitor late in the 1840's was constrained to write, "There they lie in the burying-ground, hard by together, the missionary teacher and the converted heathen."

6. Hale Aloha. This dilapidated stone building stands behind the Episcopal Cemetery in about the center of the large block bounded by Wainee, Hale, and Chapel Streets and Prison Road. It is best reached from Wainee Street. It stands on a 15900-square-foot tract owned by Waiola Protestant Church.

The predecessor of this building, known as the Hale Halewai, or Hale Lai, is sometimes said to have been built as early as 1823; and it, instead of the Wainee

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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

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STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

Church, is occasionally claimed as the first stone church in the islands. At any rate, this "sectional" meetinghouse was in bad condition by 1855, and the church voted to rebuild completely, the walls being "too old fashioned to be tolerated in these go-ahead days." The present building, called "Hale Aloha," was completed in 1858 and was "the largest sectional meeting house of its time." In 1860 the government fitted it out for use as an English Church. The building is now in a ruinous condition.

7. United States Marine Hospital. On the landward side of Front Street, between Kenui and Baker Streets, about 0.6 mile north of the Baldwin House (Dickerson St.). It is owned by the Bernice P. Bishop Estate.

In 1842 Captain John Stetson was appointed first American vice consular agent in Lahaina. Probably it was shortly thereafter that a marine hospital was established for sick and injured American merchant seamen. At any rate, Herman Melville noted that one of his shipmates was discharged from the Acushnet at Lahaina on May 29, 1843, and died in the United States Marine Hospital of a "disreputable disease." The hospital could accommodate about 60 men. In 1865 the structure was sold to the Episcopal Church and became a school for girls, and during the 1870's it was turned into a vicarage and served as such for more than 30 years.

The exterior walls of the two-story stone structure have been covered with shingles, but the front verandahs running the length of both stories still remain, and the building retains its historical integrity. It is used as a residence and is in fair condition. It is an important link with the days of Lahaina's maritime glory.

8. Roman Catholic Church (Maria Lanakila First Catholic Church). At Wainee and Dickenson Streets, this building is still an active Catholic Church. It and the adjoining cemetery occupy a tract of 3.091 acres.

The first resident Roman Catholic priests arrived at Lahaina on April 21, 1846. A church was built on the present site that same year, but it was replaced by a new structure in 1858. The present concrete church, erected in 1927-1928, was built on the same foundation and is almost a replica of the older frame structure; it is said that the original ceiling was retained in the new building.

NATIONAL PARK SERVICE

NATIONAL SURVEY OF HISTORIC SITES AND BUILDINGS
SUPPLEMENTARY SHEET

This sheet is to be used for giving additional information or comments, for more space for any item on the regular form, and for recording pertinent data from future studies, visitations, etc. Be brief, but use as many Supplement Sheets as necessary. When items are continued they should be listed, if possible, in numerical order of the items. All information given should be headed by the item number, its name, and the word (cont'd), as, 6. Description and Importance (cont'd) . . .

STATE	NAME(S) OF SITE
Hawaii	Lahaina

7. Importance and Description (continued)

Built in 1901 and therefore not strictly connected with Lahaina's most significant era, this well-known hotel is nevertheless a key part of the Lahaina scene. The description of the hotel in one guide book - "a large box of a building . . . with a wide balcony and decorative wooden railing" - may be accurate, but it fails to convey the tropical atmosphere of Lahaina's first hotel.

Condition of the Site: Lahaina today is a quiet plantation town which is beginning to stir with new life as recent harbor developments bring additional recreational and commercial boating activity and as nearby newly built resorts increase tourist visits. Despite the fact that surviving historic structures are relatively few, the town preserves much of the atmosphere of a Hawaiian native village and of a mid-19th century island port. The magnificent natural setting, with its backdrop of purple mountains and foreground of blue sea, remains unspoiled; and palms and other trees shade the streets and homes as they did in missionary days. However, paved streets, curbs, new buildings in contemporary architectural styles, and other developments are cumulatively making their effects felt and causing the historic scene to fade.

Recognizing the economic and cultural benefits of the town's historic heritage, the County of Maui and a cooperating organization, the Lahaina Restoration Committee, have obtained by contract from a planning firm a study of the historical values and a program for restoration. The proposal, presented early in 1961, called for a restoration district which covers 31.79 acres, including all of the principal historic sites except the Marine Hospital. On August 16, 1961, the county adopted an interim zoning ordinance which set aside about 8½ acres as the Lahaina Historic District. Within this area are the Court House, Pioneer Hotel, Baldwin House, and the Spring House.

-8-

APPENDIX C

HAWAII REGISTER OF HISTORIC PLACES
CERTIFICATION OF PROPERTY

HAWAII REGISTER OF HISTORIC PLACES
CERTIFICATION OF PROPERTY

Submitted to the Hawaii Places Review Board, Hawaii Foundation for History and the Humanities on October 8, 1971,

50:03:3001 (number), LAHAINA HISTORIC DISTRICT (name),

is hereby placed on the Hawaii Register of Historic Places and designated as VALUABLE with STATE significance.

William K. Kikuchi
Archaeologist
William K. Kikuchi

Architect
Ralston Nagata

Historian
Frances Jackson

Richard Paglinawan
Hawaiiana Specialist

Bernhard L. Hormann
Sociologist
Bernhard Hormann

on October 8, 1971

APPENDIX C.

Oceanographic Design Criteria and Coastal Engineering Assessment for Proposed Ferry Pier Lahaina Boat Harbor, Maui, Hawai`i, February 2005

FINAL REPORT

Oceanographic Design Criteria and Coastal Engineering Assessment for Proposed Ferry Pier Lahaina Boat Harbor, Maui, Hawaii

Prepared for:

Mitsunaga & Associates, Inc.
747 Amana Street, Suite 216
Honolulu, Hawaii 96814

On behalf of:

State of Hawaii
Department of Land and Natural Resources
Division of Boating and Ocean Recreation

Prepared by:

EKNA Services, Inc.
615 Piikoi Street, Suite 300
Honolulu, Hawaii 96814

(EKNA CN 2372-01F#)

February 2005

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LIST OF FIGURES

OCEANOGRAPHIC DESIGN CRITERIA AND COASTAL ENGINEERING ASSESSMENT LAHAINA FERRY PIER

1 INTRODUCTION

The State of Hawaii, Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DLNR-DBOR) is planning to construct a new ferry pier at the Lahaina Boat Harbor (Figure 1). Because of the harbor's small basin size and congestion, the new pier is proposed to be constructed outside of the harbor basin, at the shoreline terminus of the existing entrance channel. The Carthaginian II vessel that is presently situated at this location will be removed by others and used to create artificial reef habitat. Figure 2 shows a schematic plan for the proposed new pier.

This report documents the oceanographic design criteria for the new pier and assesses the potential impacts on coastal processes due to the new pier construction. This report is intended to support the pier design effort and the Environmental Impact Statement that is in preparation by others.

2 EXISTING CONDITIONS - TYPICAL

Lahaina Boat Harbor is located in Lahaina town on the west coast of Maui. The harbor is sheltered from the predominant tradewinds by the West Maui Mountains, and shielded from the tradewind-generated waves by the island mass. The site is also somewhat protected from the winter North Pacific swell and summer southern swell by the islands of Molokai and Lanai. Because of its sheltered and calm waters, it is a good anchorage and in the mid-1800's became a booming whaling port. A wharf was constructed at the site of the present wharf in the early 1800's, and the breakwater was constructed in the 1950's to enclose the present harbor basin.

The reef on the north and south side of the harbor is about 1000 feet wide and shallow. However, the reef narrows in front of the harbor, and the 6-foot depth contour is located less than 200 feet offshore the breakwater. It is likely that the wharf and entrance channel are at the location of a former stream or freshwater discharge, which inhibited the growth of the coral reef, making it a good location for a landing. The existing dredged entrance channel is about 14 feet below MLLW. A portion of the channel at the entrance to the harbor basin is slightly deeper, about 18 feet below MLLW.

Figure 3 displays historical aerial photos of the harbor and vicinity, from 1949 to 1997. The 1949 photo shows the wharf before the construction of the breakwater. The configuration of the fringing reefs can be seen by the lines of surf ("white water"). The 1960 aerial shows the harbor breakwater already constructed. The shoreline configuration has shown little change over this period of time. Figure 4 provides oblique aerial photos which show the surf sites on the north side of the entrance channel and on the south side of the harbor basin.

3 DESIGN WAVE AND STILLWATER LEVEL CRITERIA

Deepwater Design Waves:

Although the site is sheltered from the predominant wave types affecting the islands, it can potentially be impacted by infrequent local Kona storms and hurricanes. Although there has not been a storm on record that has tracked directly over the project site, storm systems that pass within 100 miles of the site can still generate destructive waves. Wave hindcasts of Hurricane Iniki[1] indicate maximum significant wave height of about 40 feet near the eye of the storm, decreasing to 20 feet about 150 miles from the center of the storm. Hurricane Iniki tracked south of the islands, from east to west, and then turned northerly, passing directly over the island of Kauai. The project site was about 200 miles from the eye of the storm as it turned northward and passed over Kauai. The project site did not suffer significant damage from storm waves because of the sheltering afforded by the islands of Molokai and Lanai, however, the southern shore of Maui did sustain significant damage from high waves.

Because of the paucity of data, it is not practicable to develop a statistical probability distribution of extreme wave heights for the project site. Also, because the site is protected by shallow reefs, the deepwater design wave will break prior to reaching shore. For the purposes of this project, the deepwater design wave height is based on Hurricane Iniki, having a significant wave height H_s = 40 feet and significant wave period T_s = 14 seconds. A less extreme (more frequent) design wave condition offshore the project site is estimated based on a Kona storm with an H_s = 20 feet and T_s = 12 seconds.

[1] Hurricane Iniki Coastal Inundation Modeling, prepared for U.S. Army Corps of Engineers, Pacific Ocean Division by Sea Engineering, Inc., 1993.

Design Stillwater Level:

Storms can cause a rise in the nearshore stillwater level (SWL) due to storm surge and wave setup. In general, the larger the deepwater wave height, the farther offshore it initiates breaking (i.e. the wider the surf zone), and the higher the rise in water level at the shore due to wave setup.

Along the Atlantic and Gulf of Mexico coasts, the primary mechanism of coastal flooding by hurricanes is the super-elevation of the water surface by the shoreward component of wind stress - the so-called "hurricane surge". In Hawaii, by contrast, surge is of minor importance owing to the great nearshore water depths and the absence of any significant continental shelf, which are required for the generation of surge. For Hawaii, the primary contribution to the elevated mean water level is the phenomenon of wave setup. As a wave approaches shore, it first increases in amplitude owing to the effect of wave shoaling. As the wave height increases, there is a small set-down of the mean water level. At some point the wave becomes sufficiently large (as the depth becomes steadily shallower) that it breaks. Thereafter, as the wave continues toward shore, its height decreases as its energy is consumed by turbulence, and the shoreward flux of momentum decreases as well. This change of momentum is balanced by an excess hydrostatic pressure associated with a steady rise, or setup, of the mean water level.

A singular finite-difference numerical model[2], which considers the local bathymetry as it influences wave transformation and breaking, was applied to estimate the wave setup component due to potential storm waves affecting the site. Bathymetric profiles on the north and south sides of the harbor channel were established based on the bathymetry survey conducted for this project and the NOAA hydrographic chart. Computed wave setup varied from about 2.4 feet for the Kona storm design wave to 4.6 feet for the hurricane design wave.

The design SWL includes the tide level, which establishes the elevation datum upon which the other factors contributing to the total rise in water level are added. Using a mean sea level of 1.0' above MLLW, the total design SWL is +3.4' MLLW for the Kona storm event and +5.6' MLLW for the hurricane event:

[2]Hurricane Vulnerability Study for Honolulu, Hawaii and Vicinity, Volume 2, Determination of Coastal Inundation Limits for Southern Oahu from Barbers Point to Koko Head, prepared by Charles L. Bretschneider and Edward K. Noda and Associates, Inc. for U.S. Army Engineer Division, Pacific Ocean, May 1985.

Hurricane design SWL = wave setup + MSL tide = 4.6' + 1.0' MLLW = +5.6' MLLW
Kona storm design SWL = wave setup + MSL tide = 2.4' + 1.0' MLLW = +3.4' MLLW

Nearshore Design Wave Heights:

The maximum design wave at the shoreline is dependent on the deepwater wave characteristics, nearshore bottom slope and contours, and the water depth fronting the shoreline. For this shoreline area that is fronted by shallow reef, the design wave (i.e. the maximum breaking wave on the shoreline) is depth-limited. As such, the deeper the water depth fronting the shoreline, the larger the breaking wave height at the shoreline. For an average depth over the reef flat of 3 feet, the depth-limited wave height is Hb = 0.8d = 2.4'.

For the design SWL of +5.6' for the hurricane event, the total water depth over the reef will be: total design water depth = design SWL + MLLW depth = +5.6' + 3' = 8.6' and the design wave height over the reef is Hb = 0.8d = 6.9'.

For design SWL of +3.4' for the Kona storm event, the total water depth over the reef will be: total design water depth = design SWL + MLLW depth = +3.4' + 3' = 6.4' and the design wave height over the reef is Hb = 0.8 d = 5.1'.

Because the new pier would be situated within the entrance channel, where water depth is greater than on the adjacent shallow reef flat, the design wave height could be greater than the design wave height over the reef, but not depth-limited by the depth in the channel because of diffraction and refraction effects. Using the 14-foot depth contour as the limiting depth at the seaward end of the entrance channel and design SWL of +3.4' for the Kona storm event, the total water depth will be 17.4' and the design depth limited height is Hb = 0.8 d = 13.9'. Assuming 50% reduction in wave height due to diffraction effects in the channel, the estimated maximum wave height at the location of the new pier (near the entrance to the harbor basin) is 13.9' x 50% = 7'.

Design Runup/Overtopping Heights:

When waves break on the shoreline or on a shoreline structure, the vertical height above the SWL to which the waves rush up the slope is called the runup height. The non-overtopping elevation is the SWL elevation plus the wave runup height. The wave runup is dependent on many parameters, including the shoreline or structure slope both shoreward and seaward of the SWL shoreline, the breaking wave characteristics, and the roughness of the structure slope. Breaking wave height on a structure is a function of the depth at the toe of the structure, the bottom slope, and the wave period. Wave runup height on a vertical wall can be two times the design wave height.

For a top-of-pier elevation of about +5' MLLW or lower, the pier would be awash during the design hurricane event. For the design Kona storm event, with SWL of +3.4' MLLW, there will be considerable wave overtopping onto the pier deck due to the design wave height of 7'.

Recommended Design Parameters:

Because the islands of Lanai and Molokai shelter Lahaina from hurricane-generated waves, the design hurricane wave event is a very conservative design event assuming that a hurricane will pass directly over West Maui. Because hurricanes affecting the Hawaiian Islands are rare, and they normally traverse south of the islands traveling in an east-to-west direction, the probability of a hurricane passing directly over West Maui is very small. Therefore, the design Kona storm event is the recommended design event. The Kona storm of January 1980 did cause damages to the harbor. An estimated 22 boats were destroyed or damaged by the Kona wind-driven waves along the west coast, primarily between Lahaina Harbor and Wahikuli Beach.[3] The following summarizes the oceanographic design criteria for a pier located in the entrance channel near the entrance to the harbor basin:

Design Deepwater Wave (Kona Storm): Hs = 20', Ts = 12 sec
Design Stillwater Level (SWL): +3.4' MLLW
Design Wave Height at Pier: Hs = 7'
Design Wave Height on adjacent reef flat: Hb = 5'

4 BERTHING AREA DEPTH / DIMENSIONS AND DREDGING

The design vessel is based on the specifications of the existing ferry boats that operate out of Lahaina Boat Harbor. The existing vessels include:

Maui Princess: length = 101', beam = 24', draft = 9'
Molokai Princess: length = 96', beam = 22', draft = 6.6'
Expeditions Hawaii Cat: length = 65', beam = 24', draft = 6'

[3]Post Flood Report, Storm of January 8-10, 1980, State of Hawaii, prepared by Paul Haraguchi, Pacific Weather Inc. for State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development, December 1980.

The typical minimum entrance channel width for small craft is 4-5 times the beam of the widest boat, which allows boats to pass when traveling at low speed. The design entrance channel width is 90 feet at -12' MLLW depth. However, at the inshore end near the entrance to the harbor basin, the effective channel width narrows, but the channel depth increases. This existing channel width is nominally acceptable for the ferry, but will require widening at the inshore end and at the pier location.

The channel depth of -12' MLLW is the minimum required based on the following:

MLLW tide	0'
Allowance for wave action (surge)	-2'
Bottom clearance/sedimentation	-1'
Maximum vessel draft	-9'
Total design depth	-12' MLLW

An additional 2' is recommended as an allowance for extreme low tide and vessel behavior (squat). About 50 feet of clear width at -14' MLLW is available along the southern side of the designated channel, which is sufficient for the maximum 24-foot vessel beam.

The recommended double berth width is 2.5 times the maximum vessel beam:

Double berth width = 2.5 x 24' = 60'

For the single berth width on the north side of the new pier, if we assume a design bottom at -12' MLLW, and a dredged side slope of 1V:2H to the top-of-reef elevation of -2.5' MLLW, then the side slope width is 19 feet from the bottom to the top edge of reef. Therefore, a minimum single berth width on the north side is:

Single berth width = 24' (bottom width)+ 19' (side slope) = 43'

For a pier width of 35', the total required width from the existing wharf to the reef edge on the north side of the new pier is:

Double berth width	60'
New ferry pier width	35'
Single berth width (to top of reef flat)	43'
Total width (to top of reef flat)	138'

Figure 5 shows the limits of dredging required for the new ferry pier. Figure 6 is a portion of the bathymetry survey conducted for this project, showing the proposed new pier and limits of dredging.[4] Quantity of dredging was estimated based on the cross-sections taken at 30-foot intervals, as depicted on Figure 7. The total volume of dredging is estimated to be about 2,500 cubic yards based on the current bathymetry survey conducted for this project. Exhibit 1 in the back folder of this report provides a 1"=20' scale plot of Figure 6.

5 LITTORAL PROCESSES AND POTENTIAL IMPACTS

Littoral Processes:

Waves breaking over the shallow reef cause a rise in water level known as setup. The increased water levels allow more wave energy than usual to propagate across the reef. The water which accumulates over the reef seeks to flow towards areas of hydraulically least resistance. Thus, the water on the reef flat drains into the deeper entrance channel and flows out to sea through the channel. Figure 8 schematically shows the littoral processes affecting his shoreline area. This is the typical circulation on windward shorelines with fringing reefs bounded by deepwater channels that are at the mouth of streams. The channels (termed "awa") move sand from the nearshore reefs into the deeper offshore areas. Harbor entrance channels dredged through shallow reefs are man-made "awa", that serve as sediment traps.

The bottom of the entrance channel is covered with sand, therefore, the original depth of dredging is not known because of the sand accumulation.[5] Maintenance dredging of the inshore extension of the channel in the vicinity of the present Carthaginian II berth has not been performed for at least as many years as the vessel has been situated there. According to the bathymetry survey that was conducted for this project, the south side of the channel has been dredged on a steeper slope than the north side. The reef flat on the north side is wider (extending farther seaward) than on the south side, and the seaward slope does not drop off as quickly from the reef flat to 20-foot water depth. The bottom depth within the channel averages about 12-15 feet seaward of the breakwater, but is deeper (15-18 feet) at the entrance to the boat basin. The bathymetry contours suggest that additional dredging was conducted perpendicular to the channel alignment (i.e. parallel to shore) at the entrance to the boat basin. This may result in "funneling" of water from the northern nearshore reef area into the entrance

[4] The absence of bathymetry data at the location of the new pier is due to the presence of the Carthaginian II at the time of the survey.

[5] DLNR-DBOR does not have a record of the as-built condition.

channel, which could cause higher flows to scour and suspend sediments at this location within the channel. The proposed new pier is inshore of the entrance to the boat basin (at the same location that the Carthaginian II is currently berthed), and therefore will not alter the current flow and existing circulation patterns on the reef.

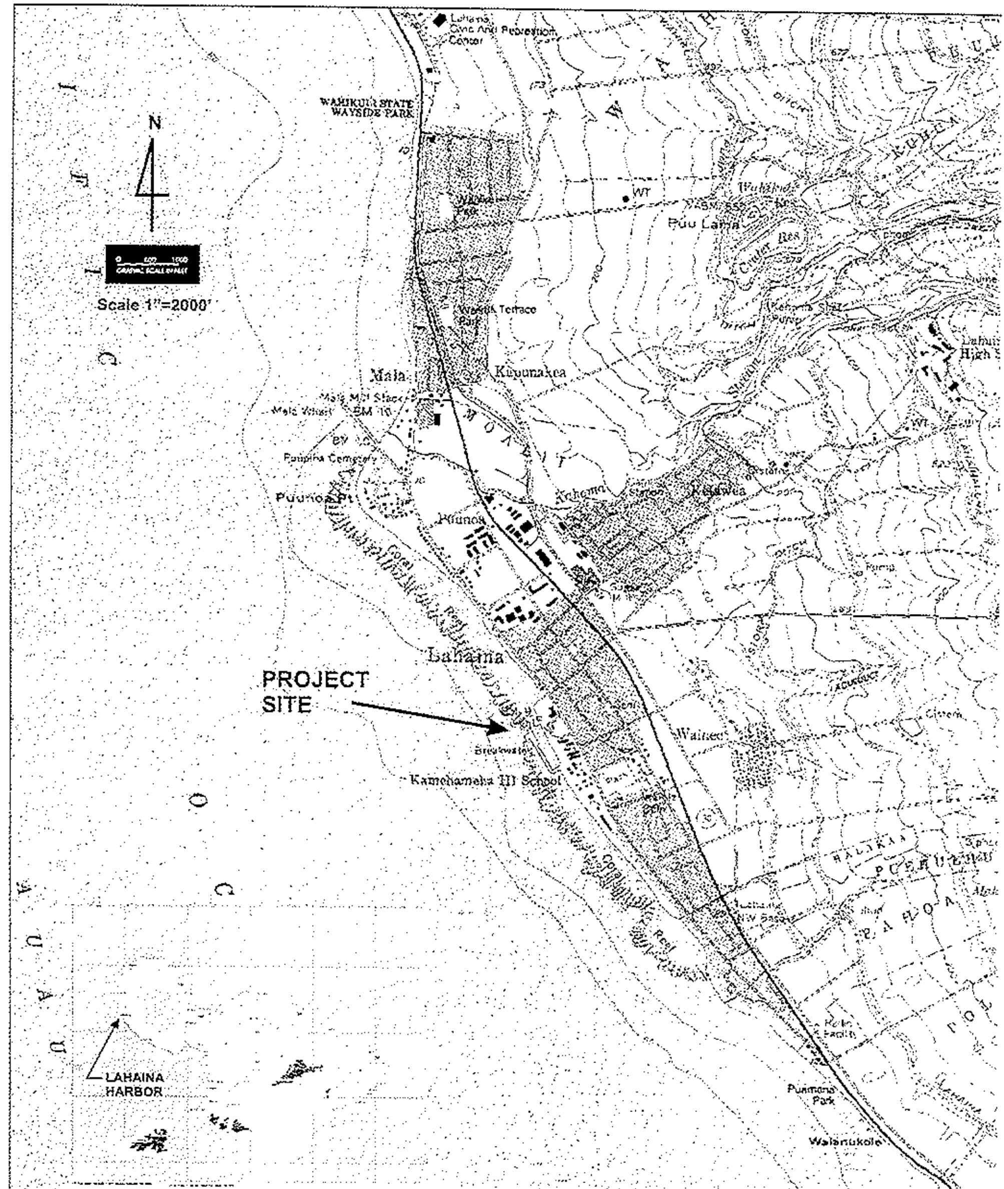
Figure 9 provides a photo rendering showing the proposed new pier and limits of dredging. Construction of the new pier at the shoreline terminus of the entrance channel will not alter the existing littoral processes and circulation on the reef flat. Any additional deepening within the limits of the channel would be conducted in areas that have been previously disturbed by dredging. However, the sides of the entrance channel are more populated by corals than on the reef flat itself, since the channel sides offer opportunities for attachment to hard substrate, and less affected by wave scour compared to the shallow reef flat. While additional dredging of the north side of the channel will necessarily remove existing corals, the re-contoured sides will offer the same opportunities for coral growth. Dredging will be confined primarily to the inshore terminus of the entrance channel, therefore, existing surf sites located at the reef margins will not be affected.

Pier Construction Alternatives:

The new pier could be constructed on piles or constructed as a wharf using sheetpiles and backfill (similar to the existing wharf). Any new pier located in the entrance channel would necessarily be considered a "fair weather" facility because there is no shelter from waves. Marginal sea conditions would render the pier unsafe for berthing. The type of construction of the new pier could also have an impact on its "usability".

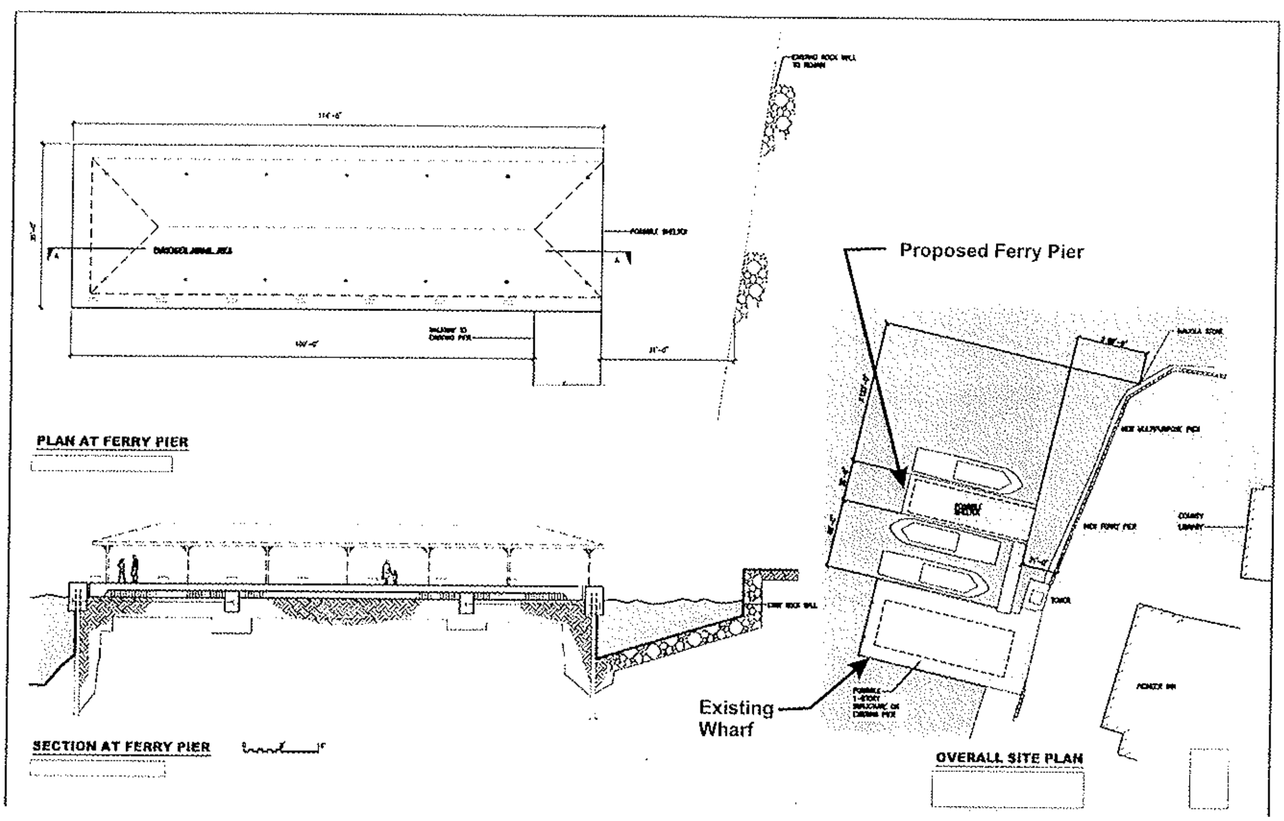
Considering the existing flows draining from the reef flat into the channel, any solid walled pier structure will likely allow sediments to accumulate on the north side of the pier. This would necessitate more frequent maintenance dredging of the north side berthing, but would minimize the accumulation of sediments on the south side berthing area. If the shore-parallel access to the pier is also sheetpiled, the mini-basin created between the existing pier and new pier would be subject to oscillations and could be problematic for berthing since it is directly exposed to wave energy entering the channel. It may also affect navigability into the harbor basin. Recognizing that the new pier would not be useable during marginal sea conditions, nevertheless the harbor entrance would still need to be kept navigable to enable vessels to return safely. Any additional "hardening" of the area near the entrance to the harbor basin could affect navigability by altering wave and current patterns within the channel.

A pile-supported pier would be less likely to affect existing wave and circulation patterns within the entrance channel because of its open substructure. Sediments carried from the reef flat into the channel will accumulate more evenly over the entire dredged area on the north side of the existing wharf. A pile-supported pier and a pile-supported shore-parallel access to the pier would maintain circulation and flushing of the area between the new pier and the existing shoreline. Otherwise, sheetpiled structures would create a shallow, sheltered mini-basin between the shoreline and the new pier that would be poorly flushed.



LOCATION MAP

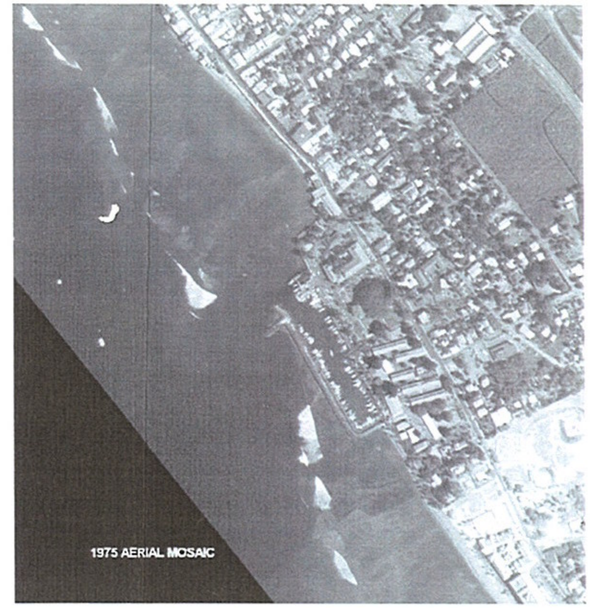
FIGURE 1



By Mitsunaga & Associates

SCHEMATIC PLAN OF PROPOSED FERRY PIER AT LAHAINA BOAT HARBOR

FIGURE 2



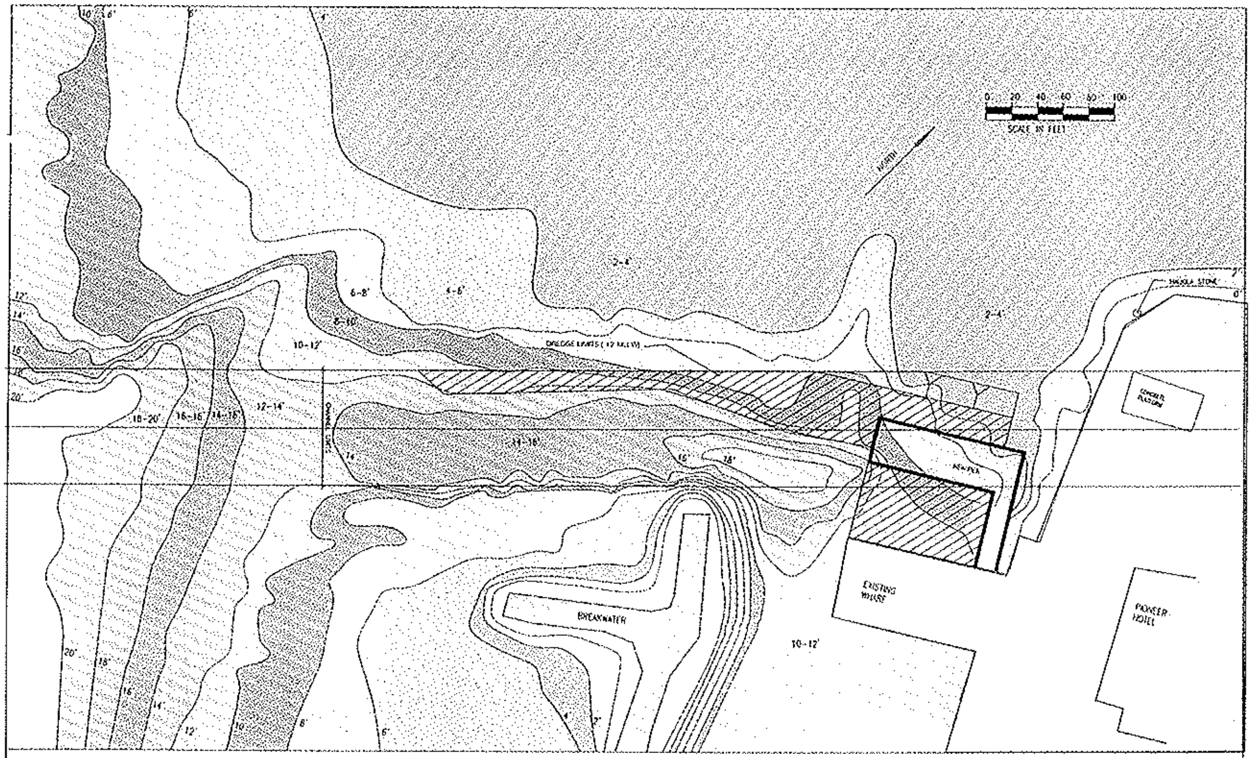
0 500 1000

GRAPHIC SCALE IN FEET

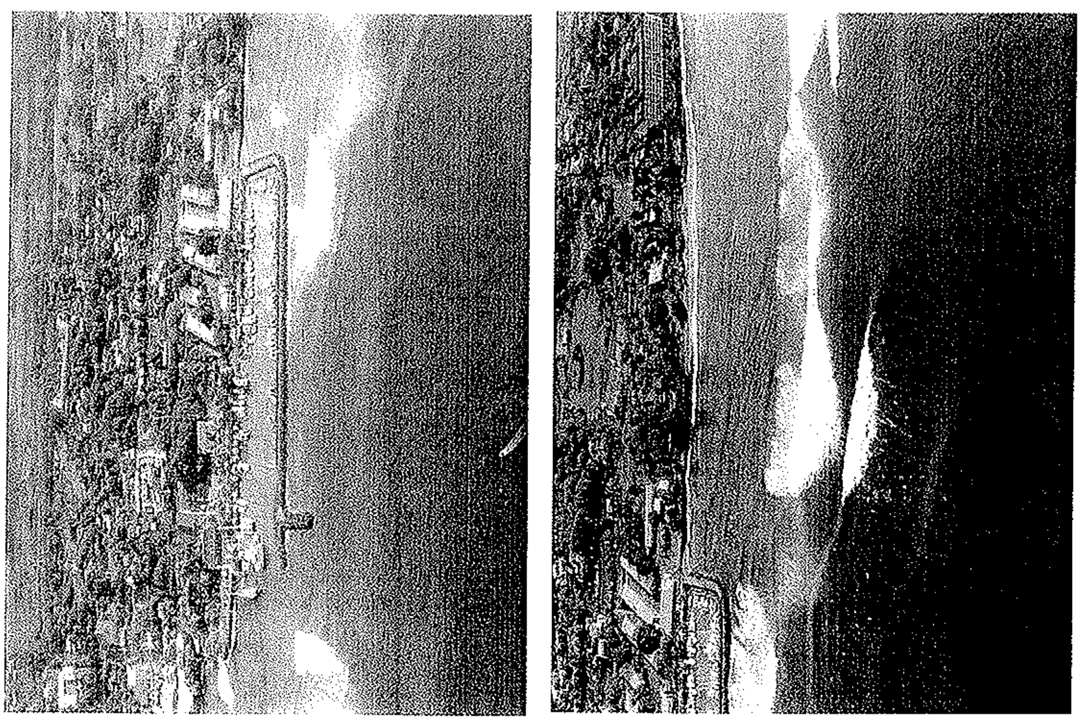
HISTORICAL AERIAL PHOTOGRAPHS
LAHAINA BOAT HARBOR
ISLAND OF MAUI

Ortho-rectified mosaics developed by the University of Hawaii Coastal Geology Group under contract from Maui County.

FIGURE 3

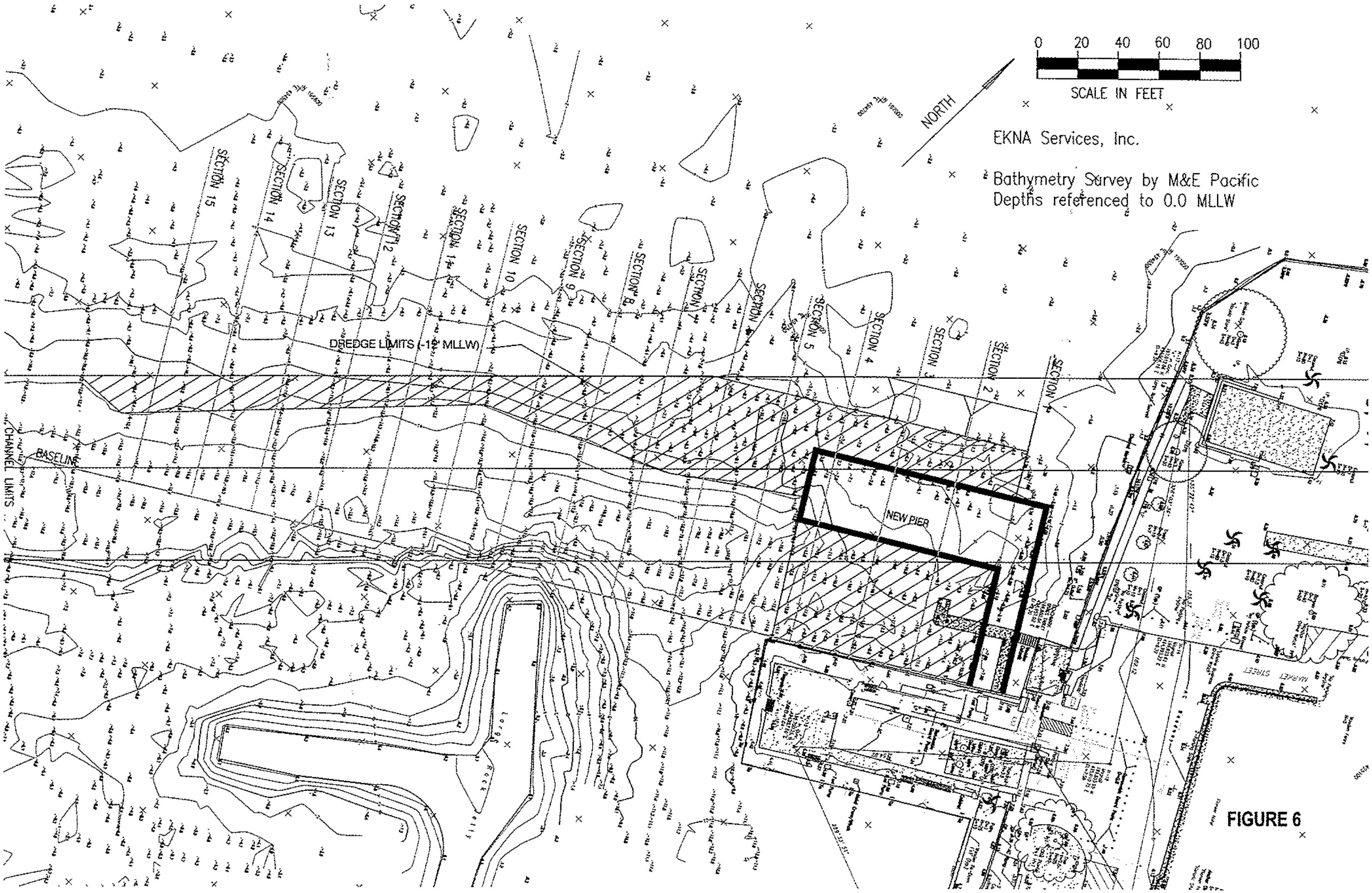


EKNA Services, Inc. LIMITS OF DREDGING - PROPOSED FERRY PIER FIGURE 5



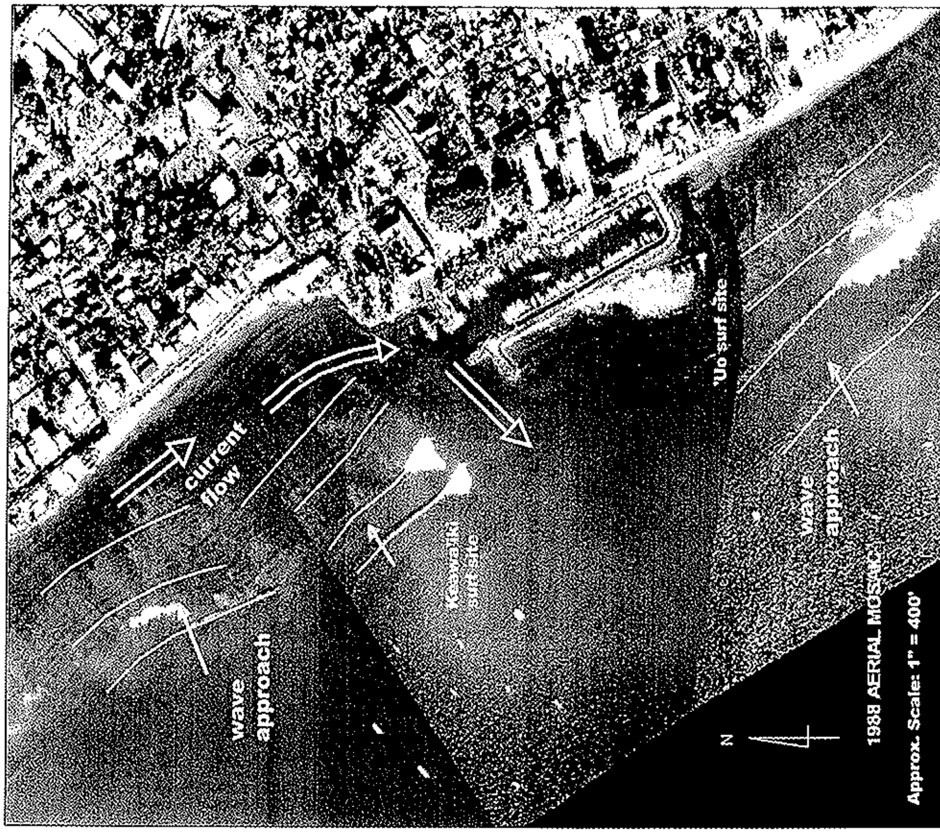
Lahaina Harbor and surf sites Keawa 'iki, located just outside the harbor entrance on the north side, and 'Uo located on the south side of the harbor.

FIGURE 4



0 20 40 60 80 100
SCALE IN FEET
NORTH
EKNA Services, Inc.
Bathymetry Survey by M&E Pacific
Depths referenced to 0.0 MLLW
SECTION 1
SECTION 2
SECTION 3
SECTION 4
SECTION 5
SECTION 6
SECTION 7
SECTION 8
SECTION 9
SECTION 10
SECTION 11
SECTION 12
SECTION 13
SECTION 14
SECTION 15
DREDGE LIMITS (-12' MLLW)
BASELINE
CHANNEL LIMITS
NEW PIER
Large Rock Jetty
MARKET STREET

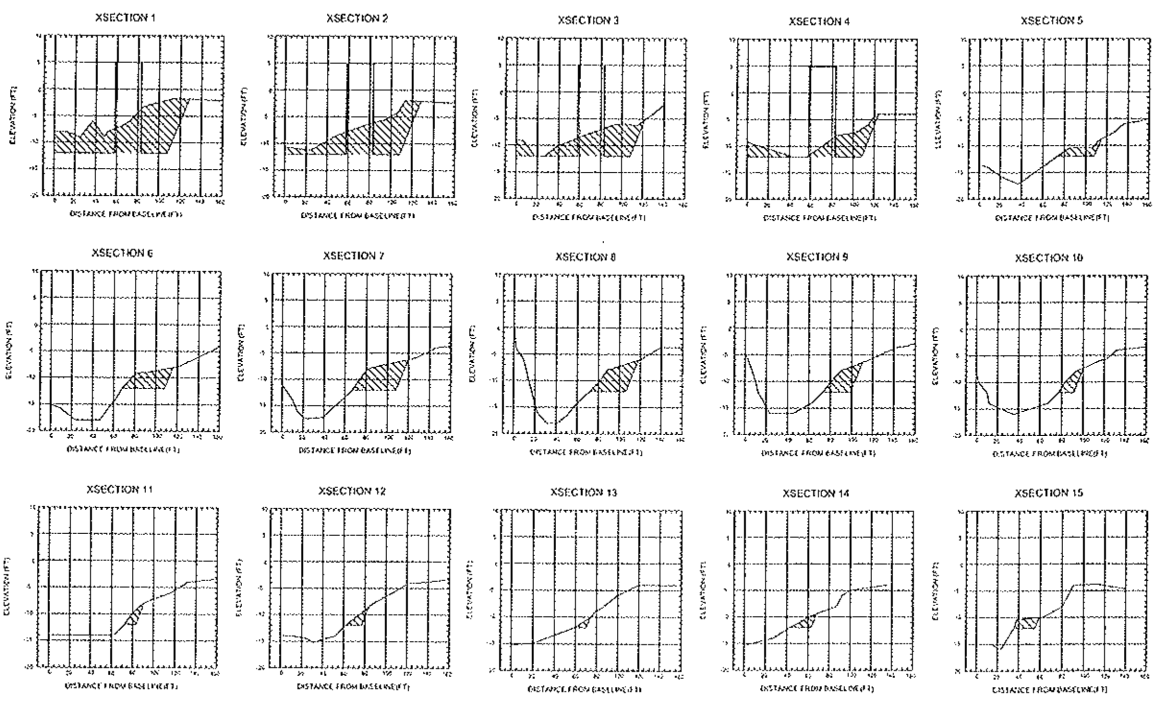
FIGURE 6



WAVE AND CURRENT PATTERNS
AT LAHAINA BOAT HARBOR

FIGURE 8

EKNA Services, Inc.



EKNA Services, Inc.

DREDGING CROSS-SECTIONS

FIGURE 7

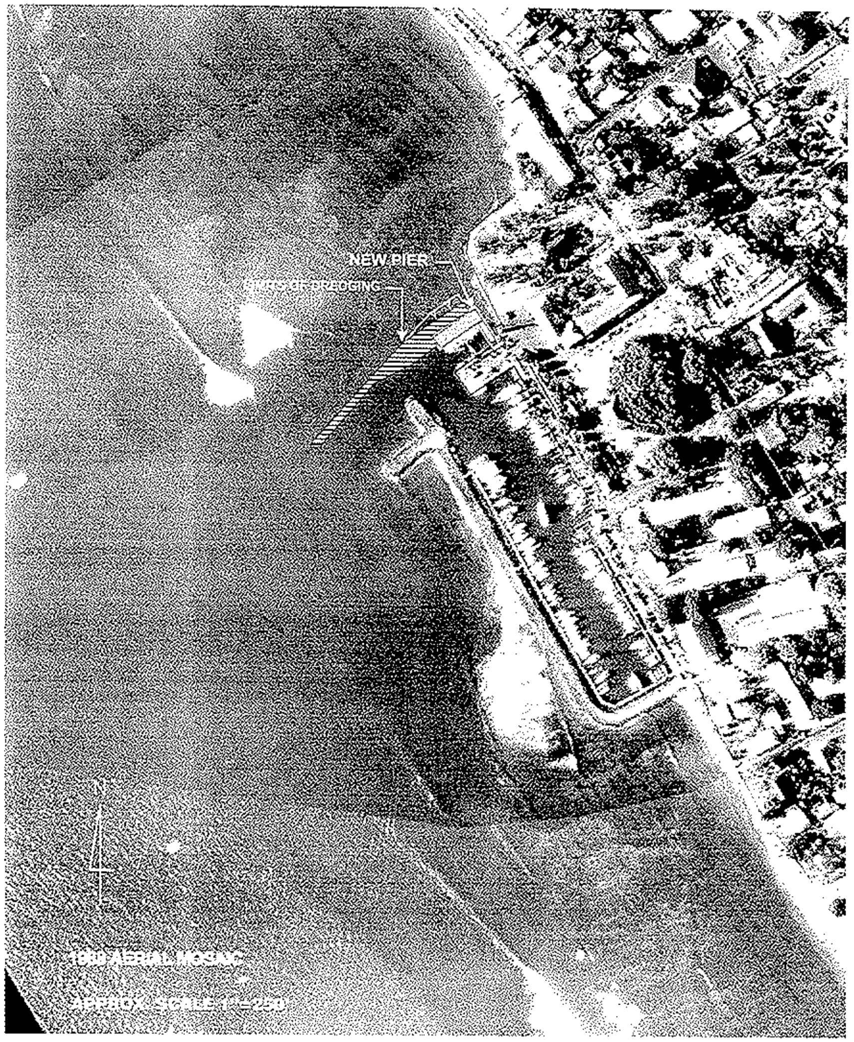


PHOTO RENDERING OF PROPOSED PIER
LAHAINA BOAT HARBOR

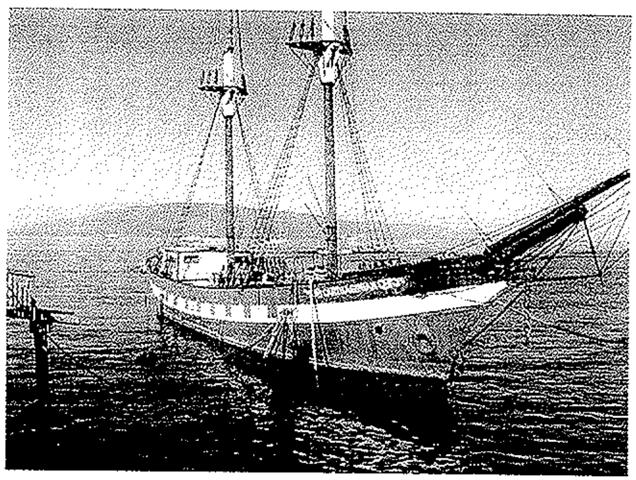
EKNA Services, Inc.

FIGURE 9

APPENDIX D.

Marine Biological and Water Quality Survey of Lahaina Small Boat Harbor, Lahaina, Maui, May 2005

Marine biological and water quality survey of Lahaina Small Boat Harbor, Lahaina, Maui



Carthaginian at Lahaina Harbor, 2004 Photo by Eric Guinther

AECOS, Inc.
45-939 Kamehameha Highway, Room 104
Kane`ohe, Hawai`i 96744

May 3, 2005

Marine biology and water quality surveys for Ferry Pier Improvements at Lahaina Small Boat Harbor, Lahaina, Maui[1]

May 3, 2005 *DRAFT* *AECOS* No. 1045A

Susan Burr, Eric B. Guinther, and Katie Laing
AECOS, Inc. 45-939 Kamehameha Hwy, Suite 104
Kaneohe, Hawai`i 96744
Phone: (808) 234-7770 Email: aecos@aecos.com

Introduction

Lahaina Small Boat Harbor (Figure 1) is located on the northwest coast of West Maui in Lahaina town. Lahaina was a noted whaling port in the mid-1800s and the small boat harbor there now is operated by the State of Hawaii Department of Land and Natural Resources - Division of Boating and Ocean Recreation (DOBOR). The harbor is one of the busiest in the state, has a diverse set of user groups, and is one of many tourist attractions in Lahaina town. Cruise ships moor well offshore (in an area known as "Lahaina Roads" since the days of the whaling fleet) and transport their passengers to shore on tenders; several ferries depart from Lahaina to Moloka'i and Lana'i; and commercial vessels take passengers fishing, whale watching, snorkeling and diving, and on submarine rides. Additionally, canoe clubs launch from the harbor for training runs and surfers enjoy access to surf breaks to the north and south of the harbor.

DOBOR plans to improve the Lahaina Small Boat Harbor by building new facilities to ease congestion. Proposed plans include constructing a new ferry pier that may be sheet piled and back- or pile-supported, as well as deepening and widening the existing harbor channel. The proposed dredging area is located within and immediately north of the existing harbor channel (Figure 2).

This report details the results of field surveys conducted on April 5, 2004, February 24, 2005, and March 10, 2005. In April 2004, a reconnaissance survey of marine biota was made, and water quality samples were collected. Results of this initial effort were reported by *AECOS* (2004). The February-March 2005 surveys were undertaken to quantify bottom types and coral cover in and adjacent to the area proposed for dredging.

[1] Report prepared for EKNA Services Inc. for Department of Boating and Ocean Recreation (DOBOR) project entitled: "Lahaina Ferry Pier project." This report will become part of the public record.

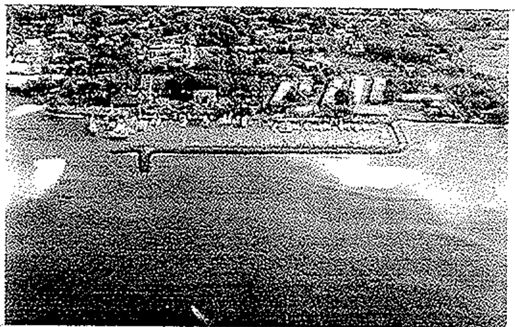


Figure 1. Lahaina Small Boat Harbor, Lahaina, Maui (HCGG, 2005).

Site Description

The channel into Lahaina Small Boat Harbor is a natural break or re-entrant in the fringing reef that extend along the West Maui coastline from about Kaua'ula Stream at the south end to near Mala Wharf at the north end (Sea Engineering and *AECOS*, 1994). The harbor was built on the fringing reef on the south side of the re-entrant. The NOAA Maui Benthic Zone and Habitat map shows the bottom of the entrance channel and Lahaina Small Boat Harbor to consist of sand (Coyne, et. al., 2003). The landward shoreline of the harbor is a concrete seawall and the harbor is enclosed on two sides by a breakwater of massive, basalt boulders (Figure 1). The adjacent shallow reef has a complex bottom type that consists of a mixture of sand, boulders, and limestone outcrops; and on which hard bottom, rubble, or boulders predominate (*AECOS*, 1981). The habitat of the reef flat zone is characterized as "macroalgae 10-50% cover" and the reef crest zone habitat is "linear reef" (Coyne, et. al., 2003).

Tidal forces dominate the current flow along the leeward coast of West Maui. During ebbing tidal periods the flow is from southeast to northwest; during flooding tidal periods the flow reverses (Sea Engineering and *AECOS*, 1994).

Carthaginian mooring area ~ The *Carthaginian* (report cover) is an old whaling-style vessel that was used as a museum but has fallen into disrepair. The vessel is currently tied up in a sand-bottom basin on the north side of the existing pier directly towards shore from the harbor entrance channel. The vessel is planned to be removed and sunk at an offshore artificial reef site to be used as an attraction for submarine tours. The mooring area is one of relatively thick sand bottom some 2 m (6.6 ft) deep (Sea Engineering, and *AECOS*, 1994).

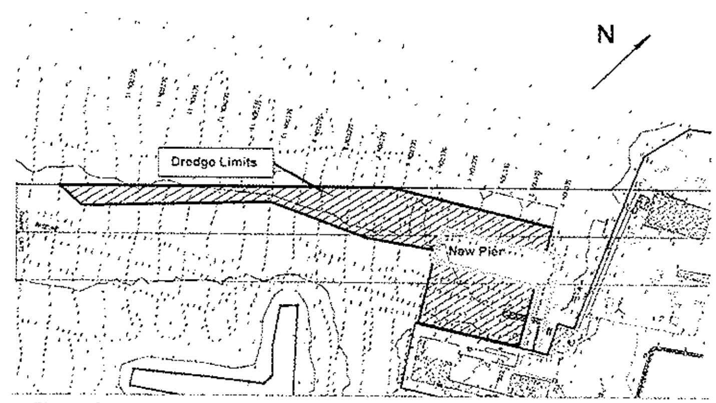


Figure 2. New pier and dredging limits for the proposed Lahaina Ferry Pier enlargement project. Hatched area denotes areas where existing channel bottom depth is less than the project design depth and would require additional dredging (Map courtesy of EKNA).

Channel and boat basin ~ The sandy-bottom harbor entrance channel extends from the *Carthaginian* mooring area out between two reef flats. The harbor itself has a surrounding breakwater that protects the harbor from impinging surf. The boat basin of the harbor is not large enough to include a turning basin. Therefore, larger vessels are forced to back in and out from the main pier.

North channel margin and reef flat ~ The marine area north of the channel is a shallow reef flat biotope that extends seaward from the shore some 150 m (500 ft) to the shoaling reef margin. The water depth ranges from 0 to 2 m (3.3 to 6.6 ft) and the area is influenced by impinging surf. The channel margin between the reef flat and the sand-bottom channel is an area of greater topographic diversity, which creates habitat for fishes and invertebrates. The vertical relief of the channel margin increases from less than one half meter beside the *Carthaginian* to about 2 meters opposite the end of the breakwater. The sloping margin between the reef flat and the channel is lined with coral outcroppings.

South channel margin and reef flat ~ Offshore from the breakwater, the reef flat extends only a short distance to the reef crest. The reef flat on the south side of the channel has a fair amount of structural complexity. Coral cover on this side of the channel margin is much greater than on the north side of the channel. The fringing reef south of the harbor is described in some detail in Sea Engineering and *AECOS* (1994).

Methods

Water Quality ~ Water samples were collected on April 5, 2004 from two stations (Figure 3) near the project area at two different tidal stages. **Station 1** was located just off the shore, immediately south of the Hauola Stone; this is near the point where the seawall starts to turn towards the mountains. **Station 2** was located along the entrance channel at the very end of the harbor breakwater. Some parameters were measured by field meter at the stations, and others in water samples collected in appropriate containers. Samples were cooled on ice after collection and taken to the *AECOS* Laboratory in Kane'ohe (laboratory Log No. 18599). Table 1 lists field instruments and analytical methods used to analyze these samples.

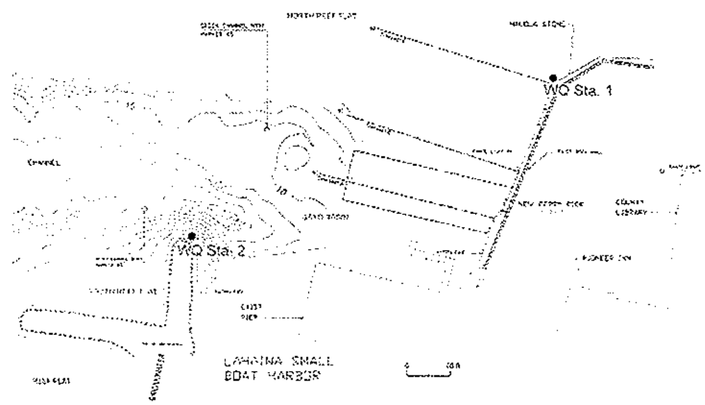


Figure 3. Water quality sampling stations and biological survey transect locations (2004) in Lahaina Small Boat Harbor.

Weather was excellent on the day of the survey and no significant rainfall immediately preceded the survey date. However, April 2004 was a relatively wet month for West Maui. The tide was low and rising at the start of the survey on April 5, 2004. A low tide of -0.2 ft (lower low water or LLW) occurred at 09:34 and the afternoon high tide of 2.0 ft (higher high water or HHW) occurred at 16:17 (NOAA, 2004).

Table 1. Analytical methods and instruments used for the April 5, 2004 water quality sampling of Lahaina Small Boat Harbor, Lahaina, Maui.

Analysis	Method	Reference	Instrument
Ammonia	alkaline phenol	Koroleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Chlorophyll α	10200 H	Standard Methods, 18th Edition (1992)	Turner Model 112 fluorometer
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 550 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1993)	SA 250
Salinity	bench salinometer	Grasshoff in Grasshoff et al. (1986)	AGE Model 2100 salinometer
Temperature	Thermister calibrated to NBS cert. thermometer (EPA 170.1)	EPA (1979)	YSI Model 550 DO meter
Total Nitrogen	persulfate digestion/EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion/EPA 365.1	Koroleff in Grasshoff et al. (1986)/EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

D'Elia, C.F., P.A. Steudler, & N. Corwin. 1977. *Limnol. Oceanogr.* 22(4): 760-764.
EPA. 1979. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency. EPA 600/4-79-020.
EPA. 1993. Methods for the Determination of Inorganic Substances in Environmental Samples. EPA 600/R-93/100.
EPA. 1994. Methods for Determination of Metals in Environmental Samples, Supplement 1. EPA/600/R-94/111. May 1994.
Grasshoff, K., M. Ehrhardt, & K. Kremling (eds). 1986. Methods of Seawater Analysis (2nd ed). Verlag Chemie, GmbH, Weinheim.
Standard Methods. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1100 p.

2004 Biological Survey ~ The April 5, 2004 biological survey involved two marine biologists snorkeling in areas of interest in order to develop a description of the reef biotopes in the project area and a list of marine macro-organisms present. Areas surveyed included the inner part of the harbor entrance channel and *Carthaginian* basin, the north reef flat and channel margin, and the south channel margin and reef flat in the fork of the breakwater and around into the boat harbor itself.

Three transects ("A", "B", and "C"), each 50 m in length, were laid out from the shore on the north reef flat in order to better characterize the bottom in the project area. These are shown in Figure 3 (above).

2005 Quantitative Marine Bottom Survey ~ Bottom types were quantified along two additional transects established on February 24 and March 10, 2005, each of which extended up to 170 meters from shore (Figure 4) to cover an area of proposed deredging. Transect 1 was located roughly down the center of the existing harbor entrance channel. Transect 2 was located across the north reef flat near the channel margin. Figure 3 shows the two transects with respect to the proposed dredge area. Both transects started at the same point on the shore, but Transect 2 was aligned to best follow a shallow contour through the area of greatest coral development along the north margin of the entrance channel. Transect 2 intersects or enters the dredge area at 17 meters from shore and exits the dredge limits at 33 meters from shore. This would be an area of direct impacts to the benthic marine community. The remainder of the transect traverses areas subject to indirect impacts from dredging.

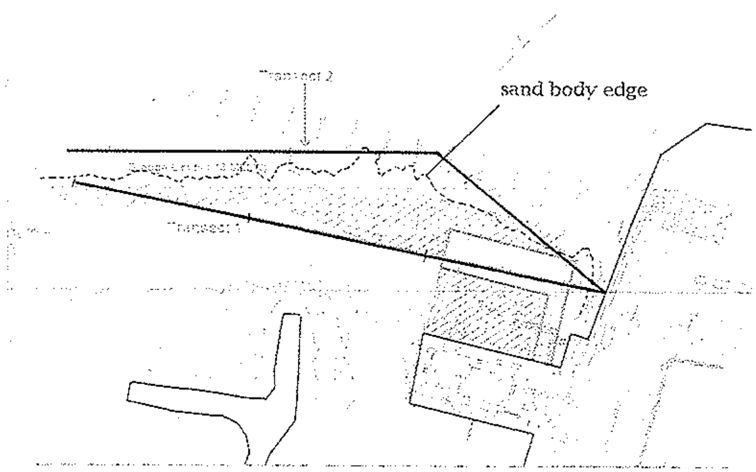


Figure 4. Limits of dredging for proposed Lahaina Ferry Pier enlargement project. The hatched area denotes limits of dredging. Black lines extending from the shoreline represent bottom type survey Transects 1 and 2 with tick marks each 50 m. Dashed line shows approximate boundary of sand bottom on north side of channel. (Base map courtesy of EKNA).

For these transects, the substratum was classified into one of four basic bottom types: sand, rubble, consolidated limestone, or live coral. Bottom types were quantified by using a 1 by 0.5 m quadrat frame placed at pre-established intervals along the transect lines. The quadrat frame was divided by monofilament line into 50 squares, 10 cm on a side. Biologists snorkeled along each transect, placed the frame on the bottom, and scored the bottom type that comprised 50% or more of each 10 x 10 cm square. By this method, each score equaled 2% of the quadrat area.

Water Quality

Hawaii's Water Quality Standards classify the Lahaina Small Boat Harbor as a Class A embayment (HDOH, 2000). As stated in the Water Quality Standards, it is the objective of Class A waters that their use for recreation and aesthetic enjoyment be protected (HDOH, 2000).

The primary purpose of the April 5, 2004 water quality measurements was to characterize the existing marine environment, not to set baseline values or determine compliance with Hawaii's Water Quality Standards (Table 2). In fact, the State criteria levels for chlorophyll α, all nutrients, and turbidity are based upon geometric mean values with a minimum of three separate samples per location needed to compute a geometric mean (HDOH, 2000). Ideally, that would be three high tide and three low tide samples. Nonetheless, our results can be evaluated against the water quality criteria for embayments (Table 2) as long as limitations regarding a possible lack of representativeness are realized.

Table 2. State of Hawaii criteria for embayments [HAR §11-54-06(a)(3)].

	Ammonium (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Chl α (µg N/l)	Turbidity NTU
Geometric mean Wet Criteria*	6.00	8.00	200.00	25.00	1.50	1.5
Geometric mean Dry criteria**	3.50	5.00	150.00	20.00	0.50	0.40

* Wet criteria apply when the average freshwater inflow from the land equals or exceeds one percent of the embayment volume per day.
**Dry criteria apply when the average freshwater inflow from the land is less than one percent of the embayment volume per day.

- pH shall not deviate from 7.6 to 8.6.
- Dissolved oxygen shall not be less than 75% saturation.
- Temperature shall not vary more than 1 °C from ambient.
- Salinity shall not vary more than 10% from natural or seasonal changes.

The analytical results of the water quality data collected at the project site on April 2004 are presented in Table 3. In general, the water quality is good as compared to the non-specific and "wet" geometric mean embayment criteria. "Wet" criteria apply when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day, but is defined in some cases as samples representing the period between November 1 and April 30 (wet season).

Table 3. Water quality characteristics on April 5, 2004 of Lahaina Small Boat Harbor, Lahaina, Maui.

	Time sampled	Temp. (°C)	DO (mg/l)	DO (% Sat.)	pH (pH units)	Salinity (ppt)	Chl α (µg/l)
Station #1	0900	25.5	6.53	97	8.09	34.3901	0.59
Station #2	0925	25.4	6.77	100	8.08	33.7213	1.59
Station #1	1345	27.2	7.11	109	8.15	34.4363	0.32
Station #2	1400	27.3	7.65	117	8.21	34.4208	0.44
	Time sampled	**Turbidity (ntu)**	**TSS (mg/l)**	**Ammonia (µg N/l)**	**Nitrate + nitrite (µg N/l)**	**Total N (µg N/l)**	**Total P (µg P/l)**
Station #1	0900	1.26	11.9	<1	3	244	18
Station #2	0925	2.60	18.1	<1	3	166	28
Station #1	1345	0.43	4.6	<1	5	135	17
Station #2	1400	0.92	5.8	<1	1	134	20

The temperatures at both stations were lower (25.4°C and 25.5°C) during the morning low tide and higher (27.2°C and 27.3°C) during the afternoon high tide. DO was near or above saturation at both locations and tidal stages. All pH values were as expected for marine waters (8.1 to 8.2). The higher pH values corresponded with higher DO values; these values can correlate as algal productivity during the day should raise DO and pH levels. Salinity values were typical for ocean waters with minimal freshwater influence (34 ppt).

Chlorophyll α values ranged from 0.32 to 1.59 µg/l, generally close to the range of 0.5 to 1.50 for dry season to wet season mean values for harbors (see Table 2). Turbidities ranged from 0.43 to 2.60 ntu and appear to be correlated with the TSS values (4.6 to 18.1 mg/l). These values are just slightly elevated relative to the standards.

The amount of inorganic nitrogen was low in these samples; the concentration of ammonia was <1 µg/l (not detected) in all samples and the concentration of nitrate + nitrite ranged from 1 to 5 µg/l. The concentration of total nitrogen and total phosphorus was perhaps slightly elevated (134 to 244 µg/l and 17 to 28 µg/l, respectively) in some of the samples in comparison with the Dry Season criteria in the water quality standards. The higher total nutrient values were associated with the low

tide (morning) sampling. All samples appear to have been minimally influenced by stormwater runoff and resuspension of bottom sediments.

The Hawaii Department of Health (HDOH) collected water quality samples from Lahaina Harbor from 1989 to 1998. The complete data set is available in STORET (USEPA, 1998) and is summarized in Table 4. Table 4 presents the arithmetic mean of this data set for temperature, dissolved oxygen, pH, and salinity and the geometric mean for nutrients and chlorophyll α. The data set did not contain values for turbidity or TSS. This data set can be compared with the data that were collected on April 5, 2004 and with the water quality standards. The temperature, dissolved oxygen, pH, and salinity values obtained on April 5, 2004 were similar to the arithmetic means of the STORET data set and each measurement value fell within the ranges obtained between 1989 and 1998. The April 5, 2004 chlorophyll α concentrations were similar to the geometric mean of the 1989 to 1998 data set. The amounts of total nitrogen and total phosphorus measured in the April 5, 2004 samples are greater than the geometric means and fall towards the higher end of ranges measured by HDOH between 1989 and 1998.

Table 4. Summary of STORET water quality data for Lahaina Small Boat Harbor from samples collected by Hawaii Department of Health between 1989 and 1998 (USEPA, 1998).

Parameter	Arithmetic* or geometric** mean	Range	N
Temperature (°C)	25.3*	18.7-28.8	61
Dissolved oxygen (mg/l)	7.43*	4.80-9.87	49
Dissolved oxygen (% sat)	89*	55-119	49
pH	8.1*	7.6-8.7	49
Salinity (ppt)	34.6*	32.0-35.7	113
Total nitrogen (µg N/l)	112**	100-300	10
Nitrate + nitrite (µg N/l)	12**	10-50	11
Total phosphorus (µg P/l)	10**	5-27	24
Chlorophyll α (µg/l)	0.40**	0.07-21.00	52

The STORET data set shows that DO and pH were not always in compliance with the water quality criteria. The nitrite + nitrate geometric mean for this data set exceeded both the dry and wet criterion, likely representing influence of groundwater on the harbor waters. The salinity, total nitrogen, total phosphorus, and chlorophyll α mean values all met the water quality standards.

Lahaina Small Boat Harbor is listed as impaired in the State of Hawaii Department of Health 2002 list of impaired waters in Hawai`i, prepared under Clean Water Act

§303(d) (HDOH, 2002). The only parameter for which the small boat harbor is listed is turbidity. The small boat harbor was assigned a "medium" priority ranking. This ranking refers to the priority for studies to determine a Total Maximum Daily Load (TMDL) of pollutants that can be discharged into the water body without it violating Hawaii's Water Quality Standards. Once the TMDL is developed, the Department of Health could impose load reductions on discharge permits (i.e., NPDES permits) and may request landowners to reduce non-point source pollution loads in order for TMDLs to be met.

Biota

A listing of the aquatic biota observed in and around the project site was developed in 2004 and is given herein as Table 5 (AECOS, 2004). This list pertains to the inner part of the entrance channel and associated reef flats and slope, the north end of the harbor itself including the sand bottom around the *Carthaginian*, and the reef flat seaward of the seawall north of the harbor to the Hauula Stone (90° bend) and out to the breaking waves (Figure 3).

The reef flat on the south side of the channel and seaward of the boat basin appeared to be more productive and diverse than the reef flat to the north of the channel, which is where the project is proposed. The reef to the south of the channel has greater topographical relief and structural complexity than the shallow and flat reef to the north of the channel.

In large part this circumstance seems to reflect the shape of the reef itself. Opposite the breakwater, the reef margin is located not far to seaward. A comparable distance seaward on the reef to the north of the harbor is only about midway across the reef flat to the reef margin. Of course the channel itself offers greater relief than the reef flat, and coral species diversity was judged to be similar on both sides of the channel; but overall percent coverage by live coral is certainly greater on the south side. Algae were more abundant and apparent to the north of the channel in April 2004, but there was a definite reduction in the number of fishes on the north side, particularly herbivores, as compared with the area to the south of the channel.

<u>Existing harbor, channel, breakwater, and south side reef flat</u> ~ The large boulders of the harbor breakwater provide good habitat for a variety of intertidal and subtidal biota. The habitat then transitions to the harbor on the inside, the entrance channel on the north side, and a reef remnant on the west or outer side. Typical littoral invertebrates were found on the basalt breakwater: *Grapsus tenuicrustatus*, *Nerita picea*, *Siphonaria normalis*, *Cellana exarata* (ʻopihi), and *Littorina pintado*. Much less algal cover was observed near the breakwater on the south reef flat near the channel than near the shore on the north reef flat, possibly reflecting the much larger

population of herbivorous fishes along the breakwater and south reef flat. Coral coverage was as high as 70 - 80% at the edge of the channel and averaged around 25% on the reef flat seaward of the breakwater. The composition of coral species found on this side of the channel was the same as on the north side of the channel, with the addition of a large *Porites compressa* colony on the harbor side of the breakwater.

Surgeonfish (Acanthuridae) were much more abundant on this side of the channel than on the north side. Corallivore butterflyfish (Chaetodonidae) were also present on this side, but not observed on the north side. Large schools of *Mulloidichthys vanicolensis* were observed in the channel, a small school of *Caranx melampygus* was observed in the harbor and typical reef species such as *Stethojulis balteata*, *Thalassoma duperrey*, *Acanthurus triostegus*, and *Abudefduf abdominalis* were common throughout the area, particularly on the reef flat seaward of the breakwater.

Table 5. Checklist of aquatic biota observed in the channel and reef area just north of Lahaina Small Boat Harbor on April 5, 2004.

		Location* and Abundance**			
Species	Common name	1	2	3	4
	ALGAE				
CHLOROPHYTA	green algae				
Enteromorpha sp.			R	R	
Halimeda opuntia (L.) Lamouroux			O		
Neomeris annulata Dickie			O		
Ulva fasciata			O	U	
HETEROKONTOPHYTA	brown algae				
Dictyota bartayresii			C	O	
Padina sp.			O		
RHODOPHYTA	red algae				
Acanthophora spicifera Borgesen			A	A	C
Asparagopsis taxiformis (Delile) Collins & Hervey			O	R	
Galaxaura fastigiata			U	R	
Liagora sp.			U		
Porolithon gardineri (Foslie) Foslie			U		
Hydrolithon onkodes (Heydrich) Penrose & Woelkering			U		
Spyridea filamentosa		U	U	O	R
	INVERTEBRATES				
CNIDARIA, HEXACORALLIA					
ACTINIARIA, ACTINIIDAE	anemones				
Actiniogeton sesere (Haddon & Shackelton)	Sesere's anemone			R	
SCLERACTINA, ACROPORIDAE					
Montipora capitata (Dana)	rice coral		<10%	<10%	<35%
Montipora patula Verrill	spreading coral		<10%	<10%	<35%
SCLERACTINA, POCILLOPORIDAE					
Pocillopora damicornis (L.)	lace coral		<5%	5%	
Pocillopora meandrina Dana	cauliflower coral		<5%	<5%	<5%

Species	Common name	Location* and Abundance** 1	2	3	4
SCLERACTINA, PORITIDAE					
Porites lobata Dana	lobe coral		5%	<5%	5%
Porites compressa Dana	finger coral				5%†
SCLERACTINA, FAVIIDAE					
Cyphastrea ocellina (Dana)	ocellated coral		R		
MOLLUSCA, GASTROPODA, PROSOBRANCHIA					
PATELLIDAE	limpets				
Cellana exarata (Reeve)	black-foot `opihi			R	
Siphonaria normalis Gould	false `opihi			R	
NERITIDAE					
Nerita picea (Recluz)	black nerite			A	
LITTORINIDAE					
Littoraria pintado (Wood)	dotted periwinkle			C	
VERMETIDAE					
Serpulorbis variabilis (Hadfield & Kay)	variable worm snail	R			
ARTHROPODA, CRUSTACEA, MALACOSTRACA					
DECOPODA, DIOGENIDAE					
Calcinus elegans (H. Milne Edwards)	elegant hermit crab		R		
DECOPODA, GRAPSIDAE					
Grapsus tenuicrustatus (Herbst)	thin-shelled rock crab			C	
ECHINODERMATA, ECHINOIDAE					
DIADEMATIDAE					
Echinothrix diadema (L.)	blue-black urchin		A		
ECHINOMETRIDAE					
Echinometra mathaei (de Blaineville)	rock-boring urchin		A	A	A
Echinometra oblonga (de Blaineville)	oblong urchin			C	
Heterocentrotus mammillatus (L.)	red pencil urchin		C		C
TOXOPNEUSTIDAE					
Tripneustus gratilla (L.)	collector urchin		C		C
ACTINOPODA, HOLOTHUROIDAE					
Holothuria atra Jaeger	black sea cucumber		C		
VERTEBRATES					
SYNODONTIDAE	lizardfishes				
Synodus ulae Schultz	`ulae		R		
HEMIRAMPHIDAE	halfbeaks				
undet.		U			
AULOSTOMIDAE	trumpetfishes				
Aulostomus chinensis (L.)	trumpetfish	U	U		U
FISTULARIIDAE	coronetfishes				
Fistularia commersonii Ruppell	coronetfish		U		U
MULLIDAE					
Mulloidichthys flavolineatus (Lacepede)	yellowstripe goatfish	C			C

Species	Common name	Location* and Abundance** 1	2	3	4
Mulloidichthys vanicolensis (Valenciennes)	yellowfin goatfish	C			C
Parupeneus cyclostomus (Lacepede)	blue goatfish				R
Parupeneus multifasciatus (Quoy & Gaimard)	manybar goatfish		U		
Parupeneus porphyreus (Jenkins)	whitesaddle goatfish		R		U
KYPHOSIDAE	sea chubs				
Kyphosus bigibbus (Lacepede)	brown chub				C
CIRRHITIDAE	hawkfishes				
Paracirrhites forsteri (Bloch & Schneider)	blackside hawkfish		R		
Paracirrhites arcatus (Cuvier)	arc-eye hawkfish		R		
CARANGIDAE	jacks				
Caranx melampygus (Cuvier)	bluefin trevally				U†
LUTJANIDAE	snappers				
Lutjanus fulvus (Forester & Scneider)	flametail snapper				U
CHAETODONTIDAE					
Chaetodon ornatissimus Cuvier	ornate butterflyfish				R
Chaetodon quadrimaculatus Gray	fourspot butterflyfish				R
Chaetodon auriga Forsskal	threadfin butterflyfish		U		U
POMOCENTRIDAE					
Abudefduf abdominalis (Quoy & Gaimard)	Hawaiian seargent		C		C
Abudefduf sordidus (Forsskal)	black-spot seargent				U
Chromis ovalis (Steindachner)	oval chromis		R		R
Stegastes fasciolatus (Ogilby)	Pacific gregory		R		R
LABRIDAE	wrasses				
unident. (juv.)			U		
Gomphosus varius Lacepede	bird wrasse				R
Stethojulis balteata (Quoy & Gaimard)	belted wrasse		C		C
Labroides phthirophagus Randall	Hawaiian cleaner wrasse				R†
Thalassoma duperrey (Quoy & Gaimard)	saddle wrasse		C		C
Thalassoma trilobatum (Laceped)	Christmas wrasse		U		
SCARIDAE	parrotfishes				
unident. (juv.)			R		
ZANCLIDAE					
Zanclus cornutus (L.)	Moorish idol				R
ACANTHURIDAE	surgeonfishes				
Acanthurus leucopareius (Jenkins)	whitebar surgeonfish		U		U
Acanthurus nigroris Valenciennes	bluelined surgeonfish		R		
Acanthurus oliviaceus Bloch & Schneider	orangeband surgeonfish		U		
Acanthurus triostegus (L.)	*Manini*		C		C
Acanthurus xanthopterus Valenciennes	yellowfin surgeonfish		R		R
Ctenochaetus strigosus (Bennett)	goldring surgeonfish		R		U
Naso hexacanthus (Bleeker)	sleek unicornfish				R
Zebrasoma flavescens (Bennett)	yellow tang				R

Species	Common name	Location* and Abundance** 1	2	3	4
ZANCLIDAE	Moorish idols				
Zanclus cornutus (L.)	Moorish idol				U
SPHYRAENIDAE					
Sphyraena barracuda (juv.)	great barracuda				R†
BALISTIDAE	triggerfishes				
Melichthys niger (Bloch)	black triggerfish				U
Rhinecanthus aculeatus (L.)	lagoon triggerfish		C		
Rhinecanthus rectangulus (Bloch & Schneider)	reef triggerfish		C		
MONACANTHIDAE	filefishes				
unident.	filefish		R		
OSTRACIIDAE	trunkfishes				
Ostracion meleagris (Shaw & Nodder)	spotted boxfish		U		U
TETRAODONTIDAE					
Canthigaster amboinensis (Bleeker)	ambon toby		R		
Canthigaster jactator (Jenkins)	Haw. whitespotted toby		C		

KEY TO SYMBOLS USED IN TABLE 5:

* Location:

1 - sand patch surrounding *Carthaginian*, or on vessel itself.
2 - reef flat north of channel.
3 - intertidal or subtidal region near seawall or breakwater.
4 - reef flat area south of channel, including channel and boat basin.
† indicates species was found only in the channel or boat basin, areas previously dredged.

** Abundance:

R - Rare - only one or two individuals observed.
U - Uncommon - three to six individuals observed.
C - Common - six to more than a dozen individuals observed.
A - Abundant - found in large numbers and widely distributed (more than twelve individuals observed).
Coral abundances are given in percent bottom coverages.

QC:

All species were observed in the field by the biologist on April 5, 2004. None was collected for identification in the laboratory or saved as a voucher specimen.

North side seawall and reef flat – Typical littoral invertebrates were found on the boulders near the seawall north of the harbor: *Grapsus tenuicrustatus, Nerita picea, Siphonaria normalis, Cellana exarata* (`opihi), and *Littorina pintado*. The introduced alga, *Acanthophora spicifera*, was abundant near shore and over the reef flat.

Biologically, the reef flat north of the harbor is rather depauperate because of the lack of available shelter on the only slightly undulating surface of the back and middle reef flat. Few corals inhabit the reef flat, but algae are fairly abundant. Coral coverage is generally less than 5%, but algae coverage nears 50%. The introduced alga, *Acanthophora spicifera*, is the dominant species on the reef flat. *Halimeda opuntia* and *Dictyota bartayresii* are scattered throughout the reef flat, and *Ulva fasciata* and

Asparagopsis taxiformis are more common on the inner reef flat. Two encrusting species of *Montipora, M. capitata* and *M. patula*, are the dominant corals throughout the reef flat. *Pocillopora meandrina* is also distributed throughout the reef flat. Small colonies of *Pocillipora damicornis* are present near shore and larger colonies of *Porites lobata* are present on the outer part of the reef flat.

Macroinvertebrates and fishes are sparse on the reef flat because of a general lack of suitable cover. *Echinothrix diadema*, or wana, is the most conspicuous invertebrate towards the outer part of the reef flat. Two species of triggerfish, *Rhinecanthus aculeatus* and *R. rectangulas*, were the most common fishes seen. A large school of *Mulloidichthys flavolineatus* was observed near the *Carthaginian*. Juvenile *Stethojulis balteata, Thalassoma duperrey*, and *Acanthurus triostegus* were also present on the reef.

Table 6 provides results from transects laid out on April 5, 2004 across the north reef flat. The biotopes and transition points between biotopes along the transects are reported in the table.

Table 6. Habitats and transition points measured along transects A, B, and C on the reef flat north of Lahaina Small Boat Harbor on April 5, 2004.

A. Sandy bottom adjacent to *Carthiginian*		B. Reef flat out from range finder		C. Reef flat out from point	
meters	description	meters	description	meters	description
0 - 0.5	Foot of seawall	0	Edge of seawall	0 - 1.0	Foot of seawall
0.5 - 2.5	Loose boulders	0 - 3.7	Loose boulders	1.0-1.8	Loose boulders
2.5-4.7	Boulders with coralline algae	3.7-5.3	Boulders with coralline algae	1.8-4.3	Boulders with coralline algae
4.7-6.5	Loose boulders with fleshy algae (*Acanthophora* - dominant, with *Asparagopsis* and *Neomeris*), small urchins, and serpulid mollusks	5.3 6.2	Loose boulders with fleshy algae	4.3-5.9	Fleshy and coralline algae; fleshy algae transitions to turf algae (fleshy algae cropped close to surface)
6.5-7.5	Turf algae with silt	6.2-7.6	Loose boulders with coralline algae	5.9-6.6	Rubble and boulders
7.5 - 10.8	Small coral colonies (*Pocillopora damicornis, Montipora* spp., *Porites lobata*) and fleshy algae	7.6-9.0	Turf algae with small *Porites* coral colonies, *Halimeda* algae, and *Holothuria* sea cucumbers	6.6-9.6	Rubble
10.8-50	Sand	9.0- 11.7	Sand and rubble with *Halimeda* algae	9.6 - 13.1	Consolidated limestone bottom with sand
	Sand bottom	11.7-	Consolidated	13.1 -	*Liagora* algae

A. Sandy bottom adjacent to *Carthiginian*	B. Reef flat out from range finder		C. Reef flat out from point	
continues out along entrance channel	19.0	limestone bottom with sand	23.0	
	19.0-20.4	Boulders with *Montipora verrucosa* and *Pocillopora meandrina* coral (<1%)	23.0-38.0	*Padina* and *Liagara* algae
	20.4-26.6	Consolidated limestone bottom	38.0-50.0	*Tripneustus* urchins and *Holothuria* sea cucumbers
	26.6-32.8	Consolidated limestone bottom with sand drifts	50 m	Even with midpoint of channel
	32.8-33.0	Coral colonies (*Montipora* spp. and *Pocillopora meandrina*)	50m - edge of reef flat	More coral cover (*Pocillopora meandrina, P. damicornis*, and *Montipora* spp.), wana urchins in areas with structural complexity, and *Holothuria* sea cucumbers. Coral cover <2%. Triggerfish are common.
	33.0-50.3	Consolidated limestone bottom with sand and turf algae (20-30% coral cover)		

Dredge Area Transects — The results of the marine bottom transect surveys conducted in February-March 2005 are summarized in Figure 5 for Transect 2. It was evident by visual observations that nearly all the 150 m length of Transect 1 was sand bottom, the only exception being the first two meters over loose rubble directly off the shore at the base of the seawall. The basin of the *Carthaginian* mooring was previously noted as all sand bottom (AECOS, 2004).. Using an aerial photograph taken in 1988 and displayed at the UH Geography website (1988), the line between sand bottom and reef rock or rubble along the north channel margin was plotted by drawing from an overlay enlarged to the same scale and properly oriented relative to fixed features such as the pier and breakwater. This line is shown dashed on the dredging limits map (Figure 4, above), providing a reasonable demarcation between the areas represented by the two transects.

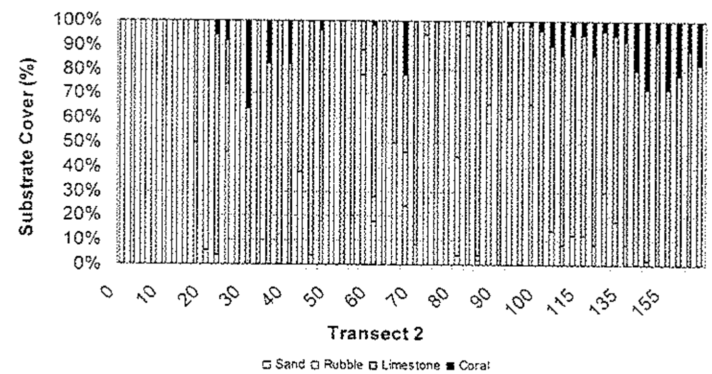


Figure 5. Percent cover for bottom types along Transect 2 measured February-March, 2005.

Unlike the all-sand bottom of Transect 1, the composition or bottom-type of the shallower reef flat surface along Transect 2 varies considerably from place to place. Along the first 15 meters, the bottom is sand and rubble; between 20 and 105 m it is a combination of sand, rubble, limestone, and live coral; and between 135 and 170 m it is primarily solid limestone supporting live coral (Figure 5, above).

Percent coral cover from each quadrat surveyed is displayed in Figure 6. The results indicate two areas of elevated coral cover: one between 23 and 53 m and the other between 100 and 170 m. The following coral species were identified: *Montipora capitata, Montipora patula, Pocillopora damicornis, Pocillopora meandrina, Porites evermanni*, and *Porites lobata*. *Cyphastrea ocellina* and *Leptastrea purpurea* were noted within or close to the transect, but did not occur in the sampled quadrats. The encrusting coral, *M. capitata* has the greatest cover along the transect with an average percent cover of 4.5% (Table 7). *M. capitata* is followed *P. lobata* and *Poc. meandrina* with 3.0% and 2.5% cover, respectively. As can be seen from the standard deviations, there is great variability in percent cover throughout the transect surveyed. At the seaward end of the transect additional visual observations were made to seaward and towards the entrance channel. These observations indicate a continued increase in coral cover, species diversity, and structural complexity, although well outside the proposed dredging area.

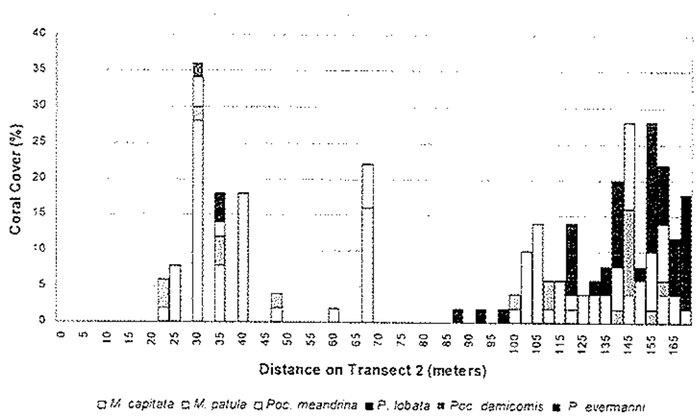


Figure 6. Percent live coral in February-March, 2005 for Transect 2. Each bar represents the percent cover within a 0.5 x 1 m quadrat.

Table 7. Mean percent cover and standard deviation by coral species for Transect 2 calculated from 56 quadrat counts.

M. capitata	*M. Patula*	*Poc. meandrina*	*P. lobata*	*Poc. damicornis*	*P. evermanni*
4.5 ±5.4	1.3 ±1.9	2.5 ±2.7	3.0 ±3.6	0.1 ±0.3	0.2 ±0.8

The predominance of particular coral species varies with distance from shore along the transect as did overall coral coverage (Figure 6). *M. capitata* has greatest cover between 23 and 68 m, whereas *P. lobata* and *Poc. meandrina* have greatest cover between 120 and 170 m from shore. Only one *Poc. damicornis* colony was observed within transect and was located 30 meters from shore. Likewise, only one *P. evermanni* coral colony was observed and was located 170 meters from shore. *Cyphastrea ocellina* and *Leptastrea purpurea* were noted off the transect.

The estimated total coral coverage within the dredge limits along Transect 2—that is, between 18 and 33 m—is 7.1% (Table 8). The species with greatest mean cover here is *M. capitata*, at an estimated 5.4% cover. The remaining species have less than 1% cover each with a combined average cover of 1.7%. Of the six corals identified in the survey, *P. lobata* and *P. evermanni* were not observed in this section of transect.

Table 8. Percent total coral cover and coral cover by species surveyed within proposed dredge limits (18 to 33 m marks on Transect 2). Means and standard deviations are also given for each category.

(m)	*Total coral*	*M. capitata*	*M. patula*	*Poc. meandrina*	*P. lobata*	*Poc. damicornis*	*P. evermanni*
18	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
23	6	2	4	0	0	0	0
25	8	8	0	0	0	0	0
28	0	0	0	0	0	0	0
30	36	28	2	4	0	2	0
33	0	0	0	0	0	0	0
MEAN	7.1	5.4	0.8	0.6	0.0	0.3	0.0
STDev	±13.2	±10.4	±1.6	±1.5	---	±0.8	---

Assessments

Dredging Impacts — As a result of deepening the harbor channel, new habitat will be created in some places and lost in others. Dredging the sand-bottom channel will lead to a deeper channel that will remain a sand bottom, but will create a more steeply sloped channel margin. The channel margin offers a narrow area of topographic complexity which unlike the reef flat to the north, hosts an abundance of coral, the majority of which lies outside the limits of dredging. The newly available limestone margin should lead to locally increased coral coverage and create additional habitat for macroinvertebrates and fishes as was observed all along the existing channel margin and boat basin. A small limestone area, between 18 and 33 m along Transect 2 is within the proposed limits of dredging and has roughly 7 % coral cover which will be lost as a result of dredging. The encrusting coral species, *M. capitata*, dominates the coral species found here with more than 5 % cover. *M. capitata* should quickly re-colonize new hard bottom made available through the dredging process. To encourage the re-colonization of the area with reef-forming corals it is recommended that dredging procedures be completed before the summer months when most local corals are spawning (reproducing). The reef flats on either side of the channel could experience indirect impacts of dredging in the forms of increased turbidity and accidental mechanical trauma.

New Pier — The construction of new piers with sheet piles and fill will destroy some near shore habitat, but will also create additional intertidal surfaces and fastland. Although not an improvement over natural sloped surfaces (or vertical surfaces created by dredging but left as natural outcrops), the vertical surfaces can be important for maintaining fish populations in the deeper basin and channel areas. Use of sheet support pilings instead of sheet piles and fill would be less disruptive of marine biological assemblages by providing vertical relief habitat in areas dominated by featureless sand bottom. It is not known whether problems will arise associated with an invasive marine species, *Carijoa riisei* (snowflake coral), which has been documented previously on the hull of the *Carthaginian* (Gulko, pers. comm.). *Carijoa* is well-suited for vertical surfaces and low light levels found under piers. There is potential for *Carijoa* to out-compete other sessile invertebrates for hard surfaces locally and become an established population of a potentially invasive species. Evidence suggests that increasing *Carijoa* populations could eventually be damaging to the offshore, deep-water black coral industry (Grigg, 2003). Although it is reasonable to assume that a pier-on-pilings design would create more habitat suitable for *Carijoa* than a sheet-pile design, other methods of control of this potential pest species will be necessary to truly alleviate concerns and eradicate the species from Maui.

Construction Impacts — Short term impacts on the biota and water quality of Lahaina Small Boat Harbor and the adjacent reef flat resulting from construction activities can be anticipated. Dredge and fill activities associated with the construction will increase turbidity during the construction period, but construction effects can be mitigated through the use of silt curtains. However, fill activities should not commence until after each area to be filled is well isolated from the surrounding marine environment by sheet piles. Temporary increases in suspended sediments as a result of construction activities will cease once the project is complete.

Boat Traffic Impacts — If harbor activity increases as a result of the expansion and construction of new facilities, increased levels of pollutants associated with greater numbers of surface craft activity (i.e., fuel, sewage, trash) can be expected in harbor waters.

Removal of *Carthaginian* — The hull of the *Carthaginian* provides habitat for some species of sessile organisms (i.e., *Serpulorbis variabilis*, variable worm snail) and intertidal organisms associated with hard bottom (i.e., *Cellana exarata* or black-foot ʻopihi) in the otherwise largely depauperate sand-bottom basin. The new pier structures will quickly be recolonized by these and similar organisms.

Permit Requirements — It will be necessary for the Division of Boating and Ocean Recreation to obtain several federal, state, and local permits to conduct the proposed work in Lahaina Small Boat Harbor. These permits include Department of Army permit, NOAA Fisheries Section 7 consultation, Hawaii Coastal Zone consistency determination, Hawaii Water Quality Certification, Hawaii Conservation District Use Permit, and Maui Special Management Area permit.

DOBOR will have to submit a Mitigation/Compensation plan that is approved by the Corps of Engineers, Honolulu Engineer District because the area adjacent to Lahaina Small Boat Harbor is categorized as a "special aquatic site." Additionally, because Lahaina Small Boat Harbor is classified as a Class II reef flat and reef community, an environmental impact statement should be prepared for this project (HDOH, 2000). The Hawaii Department of Aquatic Resources is likely to require a catalogue of

individual coral colonies located within the proposed dredge limits as pat of a mitigation plan that accounts for coral loss due to direct dredging operations as well as possible accidental takes along the reef margin.

References

AECOS, Inc. 1981. Maui coastal zone atlas (Harbors Division/CZM - overprint edition) representing the Hawaiʻi coral reef inventory Island of Maui (MICRI) Part C.I. Prod. for Harbors Division.

-------. 1988. Biological and water quality studies in the marine environment for a proposed marina development at Launiupoko, West Maui, Hawaii. Prep. for Sea Engineering, Inc. *AECOS* No. 512. 49 p.

-------. 2004. Marine biological and water quality survey of Lahaina Small Boat Harbor, Lahaina, Maui. Prep. for EKNA by *AECOS* Inc. Report 1045: 18 p.

Coyne, M. S., T. A. Battista, M. Anderson, J. Waddell, W. Smith, P. Jokiel, M. S. Kendall, and M. E. Monaco. 2003. NOAA Technical Memorandum NOS NCCOS CCMA 152 (On-line), Benthic Habitats of the Main Hawaiian Islands. Website URL: http://biogeo.nos.noaa.gov/projects/mapping/pacific/.

Department of Land and Natural Resources (DLNR). 1998. Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

Federal Register. 1999a. Department of the Interior, Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 - December 3, 1999.

-------. 1999a. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions. *Federal Register*, 64 (205 [Monday, October 25, 1999]): 57534-57547.

-------. 2001. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Notice of Findings on Recycled Petitions. *Federal Register*, 66 No. 5 (Monday, January 8, 2001): 1295 - 1300.

Grigg, RW. 2003. Invasion of a deep black coral bed by an alien species, *Carijoa riisei*, off Maui, Hawaii. *Coral Reefs*, 22 (2): 121-122.

Hawaii Coastal Geology Group, University of Hawaii-Manoa. 1988. Shoreline imagery for Maui. B/W aerial photograph, Lahaina88mos.jpg. Website URL: http://www.soest.hawaii.edu/coasts/data/maui/pictures/A_West/index.htm.

Hawaii Department of Health (DOH). 2000. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards. 62 p.

-------. 2002. Final 2002 list of impaired waters in Hawaii; prepared under Clean Water Act §303(d). Environmental Planning Office. 61 pp.

NOAA. 2004. Tide predictions. Website URL: http://co-ops.nos.noaa.gov/tides04/tab2wc3.html#167.

Sea Engineering, Inc and *AECOS*, Inc. 1994. Coastal engineering and marine environment investigations for drainline "F" improvements, Lahaina, Maui. Prep. for: Chris Hart & Partners. #94-47.

U.S. Environmental Protection Agency (USEPA). 1998. STORET Legacy Data Center. Website URL: http://www.epa.gov/storpubl/legacy/query.html.

APPENDIX E.

U.S. Fish and Wildlife Service, Fish and Wildlife Coordination Act Report, June 2006.


Photograph by Antonio Bentivoglio, USFWS

Draft
Fish and Wildlife Coordination Act Report

Ferry Terminal Improvements
at
Lahaina Small Boat Harbor
Maui, Hawaii

June 2006

Draft
Fish and Wildlife Coordination Act Report

Ferry Terminal Improvements at Lahaina Small Boat Harbor
Maui, Hawaii

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June 2006

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INTRODUCTION

Authority, Purpose and Scope

This is the draft report from the U.S. Fish and Wildlife Service (Service) on plans by the Hawaii Department of Land and Natural Resources (DLNR) to construct a new Ferry Terminal at the Lahaina Small Boat Harbor (LSBH) on the island of Maui, Hawaii. This report has been prepared under the authority of the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended (FWCA), and other authorities mandating Department of the Interior concern for environmental values. This report is also consistent with the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended (NEPA). The purpose of this report is to document the existing fish and wildlife resources at the proposed project site and to ensure that fish and wildlife conservation receives equal consideration with other proposed project objectives as required under the FWCA. The report includes an assessment of the significant fish and wildlife resources at the proposed project site, an evaluation of potential impacts associated with the proposed project design alternatives, including a Habitat Equivalency Analysis (HEA) for anticipated project impacts, and recommendations for fish and wildlife mitigation measures.

The proposed project is sponsored by the Federal Transit Administration (FTA) with the State of Hawaii, Department of Land and Natural Resources (DLNR) acting as the local sponsor. The LSBH engineering plans indicated that the project will involve placement of fill material into waters of the United States and thus will be subject to Rivers and Harbors Act section 10 and Clean Water Act section 404 regulations. Based on information from the DLNR, the estimated costs to construct the proposed project alternatives are between approximately 3 and 19 million dollars.

The purpose of the proposed project is to improve existing operating conditions at the LSBH by alleviating ship traffic and harbor congestion at the one existing pier. The existing pier is about 66 feet (ft) [20.1 meters (m)] wide and 120 ft (36.6 m) long and contains the harbor master's office, ferry kiosk, and diesel fuel dispensing and sewage pumping facilities. This pier is used for loading and unloading passengers onto recreational and commercial vessels, including cruise ship tenders (*i.e.*, shuttle craft) and inter-island ferry vessels. The pier also is used by surfers to gain access to nearby surf.

The inter-island ferry provides service between Maui (Lahaina), Lanai (Manele) and Molokai (Kaunakakai). The Lahaina/Manele ferry runs five daily round trips and the Lahaina/Kaunakakai ferry runs twice daily round trips on Monday through Saturday. On Sundays, the Lahaina/Kaunakakai ferry makes a one way trip from Kaunakakai to Lahaina. At times, the inter-island ferries are unable to load or unload their passengers in a timely manner due to cruse ship shuttle craft and local harbor traffic (related to fueling and sewage pumping activities at the pier). The proposed new ferry terminal pier should improve operating conditions at the LSBH.

Coordination with Federal and State Resource Agencies

Service biologists have discussed the proposed project with staff of the FTA, DLNR, National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries Service), U.S. Environmental Protection Agency (USEPA), and the U.S. Army Corps of Engineers (Corps). A team of marine biologists from the Service, DLNR Division of Aquatic Resources (DAR), and the Bernice P. Bishop Museum (BPBM) collaborated on field surveys to collect the coral reef resource data that was used as the basis of this report. Concerns relative to the protection and conservation of important fish and wildlife resources at the LSBH expressed by these agencies are incorporated into the report. Copies of this draft report are being provided to all of the agencies.

Prior Fish and Wildlife Meetings, Studies and Reports:

December 2004 – The Service received a notice of intent to prepare an Environmental Impact Statement (EIS) for the proposed LSBH ferry pier improvements.

April 2005 – The FTA and DLNR requested information from the Service on the potential for a FWCA investigation for the proposed LSBH project.

May 2005 - The Service received a letter from FTA requesting initiation of a FWCA investigation.

September 2005 – The DLNR held a meeting and presented background information, timeframes and alternatives for the proposed LSBH project.

October 2005 – The Service provided DLNR with a Planning Aid Letter on the LSBH ferry pier improvement project and a Scope of Work for an associated FWCA investigation.

November 2005 – The Service provided DLNR with a concurrence letter on the key components of the Preliminary Draft EIS on the proposed project in accordance with the Memorandum of Understanding for the NEPA/CWA Integration Process for Surface Transportation Projects in the Sate of Hawaii.

December 2005 – Service, DAR, and BPBM staff conducted coral reef surveys at LSBH and Mala Wharf and discussed possible mitigation measures with the Lahaina harbor master.

February 2006 – The Service met with DLNR and LSBH project contractors to discuss preliminary results of a HEA performed on data collected in December 2005.

DESCRIPTION OF THE PROJECT AREA

The Hawaiian Archipelago is located in the North Pacific Ocean, approximately 2,100 miles (mi) [3360 kilometers (km)] from California. Nineteen islands and atolls extending across a distance of 1,500 mi (2,400 km) comprise the Hawaiian Archipelago. The main islands are the eight high

islands at the southeastern end of the island chain. These islands are, from the northwest to southeast, Niihau, Kauai, Oahu, Molokai, Lānai, Kahoolawe, Maui and the Island of Hawaii. The proposed project area at Lahaina Small Boat Harbor is located at 156° 40' 39" W longitude and 20° 52' 20" N latitude.

Maui covers approximately 728 mi^2 (1185 km^2). The island is a volcanic doublet, comprised of two connected volcanoes, Haleakala forming east Maui and Mauna Kahalauau forming west Maui. The highest elevation on Maui is the peak of Haleakala at 10,023 ft (3,050 m).

Due to oceanic influences, the sea level climate on Maui is remarkably stable, with temperatures generally ranging between 65° and 85° Fahrenheit (20 and 29° Centigrade). Rainfall is greater in the winter (November through April). However, because of the two volcanic mountains there is a wide range of climatic conditions depending on elevation and protection or exposure to the prevailing northeast tradewinds. The top of west Maui receives over 400 inches (in) (101.6 centimeters [cm]) of rainfall per year, whereas the coastal town of Kihei receives less than 10 in (25.4 cm) due to the rain shadow effect of Haleakala. Kahului airport has an average rainfall of about 19 in (48.3 cm), whereas Olinda, upslope from the airport, receives about 73 in (185 cm) of rain (2005, http://en.wikipedia.org/wiki/Maui).

Maui has an unusual weather feature known as the Maui vortex, an area of clear sky that often forms over Pukalani due to the swirling vortex of air as it enters the central valley after being forced around Haleakala. Maui, along with the other Hawaiian Islands, experiences a hurricane season in the late summer and fall. Tropical storms typically approach from the southeast (2005, http://en.wikipedia.org/wiki/Maui).

Lahaina Harbor is located in west Maui and is an ideal harbor site due to natural protection from the predominant tradewinds. Waters offshore of Lahaina are partially protected from both northern winter swells and southern summer swells by the islands of Lanai and Molokai. This results in a well-protected anchorage that was used by whaling ships in the early 1820s. A wharf was constructed at the site of the present pier in the early 1880s. A breakwater to protect the harbor basin was constructed in the 1950s, and the harbor basin and entrance channel were dredged beginning in the 1970s (Munekiyo and Hiraga, Inc. 2004).

Coral Reef Resources

Marine communities in Hawaii are comprised of thousands of plants and animals that are part of the greater coral reef ecosystem, which includes areas that may be dominated by live coral colonies, coralline algae, seagrass, macro-algae, and sand. Coral reefs are unique in that they are geological structures built by living communities. Coral polyps deposit calcium carbonate skeletons and grow upward as they continue to deposit new skeletal material from below. Many other organisms also deposit skeletons or shells on the reef. When corals or these other organisms die, their skeletal remains become part of the reef framework largely as a result of the cementing action of coralline algae. New corals settle on top of dead ones to continue the overall growth of the reef. Thus, the reef can be viewed as a thick framework of calcium carbonate rock covered with a fragile, thin veneer of life. The reef surface and underlying framework form an important complex of holes, tunnels, and elevated projections that provide a wide range of shelter, foraging, and reproductive habitats for numerous species of fishes, invertebrates, and other organisms.

The most ubiquitous type of coral reef at Maui is the fringing reef. Fringing reefs are geologically young structures that extend a modest distance from the shoreline and represent the general growth pattern of the coral community around high tropical islands. The fringing reefs around Maui are relatively high-energy environments that have evolved to support complex communities of plants and animals.

Maui's fringing reefs are important because they provide extensive habitat that supports a wide variety of ecological functions. From a biological perspective, these functions include nesting and recruitment, foraging, resting, and sheltering from predators for highly diverse assemblages of species, including the federally listed threatened green sea turtle (*Chelonia mydas*) and endangered hawksbill sea turtle (*Eretmochelys imbricata*). Maintenance of coral reef habitats that support these ecological functions is dependent on protecting the thin, top layer of living coral, which requires clean, well-oxygenated, tropical seawater for maximum health. Although corals are fragile and can be broken by storm waves, healthy reefs can continually heal themselves from wave damage and other natural impacts.

Healthy fringing reefs provide other ecological functions such as buffering exposed coastal shorelines from strong oceanic swells and currents. They reduce and disperse storm wave energy over the reef flat, protecting shorelines from erosion. In turn, intact shorelines protect coastal vegetation and habitats for a wide variety of native terrestrial organisms, including sea turtles and migratory birds. Likewise, intact shorelines also help protect upland areas for human inhabitants.

Other ecological functions provided by healthy fringing reefs include the maintenance of intact marine communities in the near-shore environment that interact with pelagic or terrestrial species through complex predator, prey, or symbiotic relationships common in tropical ecosystems. Also, healthy coral reef resources directly benefit the residents of Maui by supporting human activities such as subsistence harvest/fishing, many recreational activities, tourism, and cultural practices.

Coral distribution is limited by numerous factors, including alteration of habitat, sedimentation, water quality, water temperature, predator outbreaks, and hurricanes. Dredging destroys entire coral colonies by direct removal. Sediment that becomes suspended in the water column from dredging activities or other factors may settle on coral polyps and smother them. Suspended sediment may also abrade or contaminate coral polyps and planktonic larvae and render them non-viable. Water quality is an important consideration for coral reefs.

Hawaiian coral reefs remain vulnerable to alien species, destructive fishing practices, marine debris, coastal runoff and sedimentation, ship groundings, marine recreation, urbanization and coastal development (Turgeon, et al. 2002). Elevated levels of nutrients (*e.g.*, phosphates or nitrates), petroleum products, or polychlorinated byphenyls (PCBs) may have lethal or sub-lethal affects upon coral communities. Sewage and leachate from unlined landfills are primary sources of chemical contamination that may degrade coral reef communities.

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

With regard to the proposed project, the Service's primary concern is that endangered species and other fish and wildlife resources and their habitats may be adversely impacted from the discharge of fill materials in the marine environment. Specific Service planning objectives are to maintain and enhance the existing significant habitat values at the proposed project site by (1) obtaining basic biological data for the site, (2) evaluating and analyzing the impacts of proposed-project alternatives on fish and wildlife resources and their habitats, (3) identifying the proposed-project alternative least damaging to fish and wildlife resources, and (4) recommending mitigation measures that are protective of fish and wildlife resources that result in the avoidance of unnecessary impacts, minimization of unavoidable impacts, and compensation for unavoidable resource losses consistent with the FWCA and the Service's Mitigation Policy.

Under the authority of the Endangered Species Act (ESA), the Department of the Interior and the Department of Commerce share responsibility for the conservation, protection and recovery of federally listed endangered and threatened species. Authority to conduct consultations has been delegated by the Secretary of the Interior to the Director of the Service and by the Secretary of Commerce to the Assistant Administrator of the NOAA Fisheries Service. Section 7(a)(2) of the ESA requires Federal agencies, in consultation with and with the assistance of the Service or NOAA Fisheries Service, to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitats. The Biological Opinion is the document that states the opinion of the Service or NOAA Fisheries Service as to whether the Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

The Service's Mitigation Policy (Federal Register 1981) outlines internal guidance for evaluating impacts affecting fish and wildlife resources. The Mitigation Policy complements the Service's participation under the NEPA and the FWCA. The Service's Mitigation Policy was formulated with the intent of protecting and conserving the most important fish and wildlife resources while facilitating balanced development of this nation's natural resources. The policy focuses primarily on habitat values and identifies four resource categories and mitigation guidelines. The resource categories are the following:

a. Resource Category 1: Habitat to be impacted is of high value for the evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section.

b. Resource Category 2: Habitat to be impacted is of high value for the evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.

c. Resource Category 3: Habitat to be impacted is of high to medium value for the evaluation species and is relatively abundant on a national basis.

d. Resource Category 4: Habitat to be impacted is of medium to low value for the evaluation species.

The coral reef ecosystem fronting the project site at Lahaina comprises the habitat of major concern. Although corals are very small and sensitive organisms, healthy coral colonies are fundamentally important in providing the basic foundation for habitat that supports diverse communities of other highly specialized marine organisms. Corals contribute the bulk of the calcareous raw materials that form and maintain the basic structural framework of the reef. Coral colonies add significantly to the submarine topographic relief in which a large number of fish and invertebrate species find shelter and food. Coral polyps themselves are an important food source for some fishes and other marine life. The institutional significance of U.S. coral reefs has been established through their designation as Special Aquatic Sites under the Clean Water Act [40 CFR Part 230 §230.44/FR v.45 n.249] and as a Federal Trust Resource via Executive Order 13089 on Coral Reef Protection. Special Aquatic Sites possess special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values and contribute to the general overall environmental health or vitality of an entire ecosystem of a region.

Coral reefs are relatively scarce on a national basis and are currently in a world-wide state of decline (U.S. Coral Reef Task Force 2000; Waddell 2005). In the Main Hawaiian Islands, some coral reefs are subjected to relatively frequent adverse impacts from land-based sources of pollution, over-fishing, recreational overuse, and alien and invasive species, and the extent of healthy and productive coral reefs may be declining on a local basis (Turgeon et al. 2002; Friedlander et al. 2005). The Service considers the coral reef habitats within the proposed project site to be Resource Category 2 habitats. The Service's resource goal for Category 2 habitat is no net loss of in-kind habitat values. Under this designation, the Service will recommend ways to mitigate losses through measures to avoid or minimize significant adverse impacts. If losses are unavoidable, measures to immediately rectify, reduce, or eliminate losses over time by the replacement of in-kind habitat values will be recommended for incorporation as integral project features.

Corals, algae, invertebrates, seagrass, and reef fishes have been selected as the evaluation species for the reef habitats that may be affected by the proposed project. Selection of a diverse assemblage of organisms allows for a more complete snapshot of the baseline conditions prior to construction. This information is important in determining if on-site compensatory mitigation actually provides services similar to those lost from the construction.

EVALUATION METHODOLOGY

Marine Biological Assessment

A team that included scientists from the Service, Hawaii DAR and the BPBMconducted a marine biological assessment of the shallow reef environment at Lahaina Small Boat Harbor to evaluate potential impacts to fish and wildlife resources based on the proposed project design criteria. Observations of the distribution and relative abundance of reef fishes, corals, other macro-invertebrates, and algae were compiled. Global Positioning System (GPS) data were collected to identify the location of all survey transects.

Service ecologist Antonio Bentivoglio, BPBM scientist Holly Bolick, and DAR ecologists David Gulko and Ryan Okano conducted the marine survey work for this project during December 11-14, 2005. Mr. Bentivoglio collected marine fish and benthic substrate rugosity data, Ms. Bolick collected benthic macro-invertebrate data, Mr. Gulko collected coral data; and Mr. Okano collected data on algae and benthic substrate cover. All marine surveys were conducted between 8:00 am and 5:00 pm. Photographs for this report were supplied by all surveyors.

Data from a total of seven survey stations were collected to characterize the marine community at the proposed project site. Quantitative transects were used at all survey stations. Two 98 ft (25 m) transect lines were deployed per survey station. Deployment generally occurred end-to-end along the bottom, no more than 20 ft (5m) apart. Biologists swam the length of the transect tape collecting biological data. Rugosity was measured using a small-link chain laid over the substrate under the transect tape. To collect additional fish diversity data, random swims were conducted between the transect lines and after the timed transect swims were completed. All dive operations were conducted from shore. For more detailed descriptions of specific methods employed to collect data on fishes, algae, corals, and other invertebrates, see Appendix A.

HEA: Quantitative Determination of Compensatory Mitigation

In a review of the application of compensatory mitigation for coral reef impacts resulting from federal projects in the Pacific (USFWS 2003), the Service concluded that federal agencies needed to improve their performance in implementing a successful mitigation process. As a result, the HEA methodology was used in the current project to improve the efficiency and effectiveness of mitigating project-related losses, specifically focusing on compensatory mitigation. HEA is a quantitative method used to determine the necessary amount of compensatory mitigation needed to offset project-related impacts. In 1991, HEA was developed (King and Adler 1991) as a methodology for scaling compensatory mitigation under section 404 of the Clean Water Act, and currently, it is used extensively in natural resource damage assessments conducted under the Oil Pollution Act of 1990 (33 U.S.C. 2701 *et seq.*).

Basically, HEA quantitatively scales compensatory mitigation so that the total quantity of ecological services the compensatory mitigation is anticipated to provide is sufficient to offset the total quantity of ecological services anticipated to be lost as a result of a proposed project. Ecological services have a temporal dimension as well as a spatial dimension (*e.g.*, a given area of coral habitat provides various beneficial services over a period of time). Therefore, projected impact-area information and biological data from the surveys are input into the HEA mathematical model and the output is in time-area units, in this case square foot-years.

The results of the field work conducted in this investigation characterize the "baseline" conditions at the proposed project site before the project-related impacts occur. These data and other quantitative data were used to produce three HEA models (one for each of the major habitat types: sand, pilings, and reef flat), and this information is presented in Appendix B. The HEA model applications were conducted by Bruce Peacock and Heather Goeddeke of the National Park Service. The biological inputs to the HEA models were extensively discussed between the biological assessment team and these experts prior to execution of the model applications.

DESCRIPTION OF FISH AND WILDLIFE RESOURCES

GPS coordinates were collected for each survey transect station and these are presented in Table 1. Figure 1 shows the approximate location of the Lahaina survey stations at the LSBH in relation to the proposed dredge area. It is important to note that GPS accuracy at Lahaina was within 15 feet (4.6 m) of the exact location. Due to the small scale of the map in Figure 1, the survey lines are approximations. The complete biological results of the FWCA investigation are contained in this report (Tables 2-6). The percent (%) contributions of various types of substrate cover recorded on the LSBH transects are presented in Table 2. The marine macro-invertebrate diversities and densities recorded on the LSBH transects are presented in Tables 3 and 4. The coral diversity and density data are presented in Table 5. The fish diversity and biomass data are presented in Table 6.

Existing Conditions at the Lahaina Small Boat Harbor

Terrestrial

Currently, there is no proposed work that will occur on land. Therefore, impacts to terrestrial animals, plants or habitat are not expected at the project site.

Marine

The inner harbor shoreline is a concrete seawall that continues north of the harbor and protects most of the town. The waters off West Maui are relatively calm and buffered from most ocean swells (except south and southwest swells) due to the protection provided by the surrounding islands of Molokai, Lanai and Kahoolawe. The near-shore bottom consists primarily of hard consolidated, coralline reef pavement interspersed with sand pockets, coral colonies, and terrestrial sediment. Prevailing coastal currents in the Lahaina area are largely influenced by tides, with currents generally parallel to shore. The Lahaina harbor channel appears to provide a pathway for the outflow of nearshore water (AECOS 2005; EKNA Services 2005).

The reefs on the north and south sides of the harbor are about 1,000 ft (304 m) wide and shallow. Waves that break over these shallow reefs drive water across the reef towards areas of least resistance resulting in a general flow out to sea through the deeper entrance channel. The currents move sand, which is then carried to offshore areas through the channel. However, stagnant areas near the channel can serve as sediment traps, thus, necessitating the need for maintenance dredging (AECOS 2005; Mitsunaga Services 2005).

Benthic substrate data are presented in Table 2. A total of 38 species of marine plants (Table 2), 50 species of benthic macro-invertebrates (Table 3), 11 species of corals (Table 5), and 52 species of reef fishes were observed and recorded (Table 6). Federally threatened green (*Chelonia mydas*) and endangered hawksbill (*Eretmochelys imbricata*) sea turtles are known to exist in Hawaii and three green sea turtles were observed swimming during the LSBH site surveys. Green sea turtles are known to forage on the reef flats surrounding the LSBH.

Survey Station Results

At the time the marine surveys at LSBH began, the steel-hulled German freighter named Carthaginian II, was moored at the LSBH within the proposed project area. This vessel was secured with lines and anchors that bisected survey station 1 and survey notes reflect this. Three days after the survey began, the Carthaginian II was towed to deeper water and sunk to create an artificial reef and dive site. Surveys conducted in the area that was crossed by the vessels mooring lines were done after the vessel was moved out of the harbor.

Survey Station 1: North of the existing pier, in the turning basin adjacent to the former anchoring site of the Carthaginian II. This survey station consisted of sand that had filled in the channel since the last maintenance dredging occurred (estimated to be in the 1970s). Water depth varied from 2 to 3 m at the furthest seaward point. Benthic substrate cover was 98% sand, 1.5% turf algae and 0.5% macro-algae; and rugosity was 10, indicating that the substrate was flat. **Algae:** Seven species of algae were observed, all of which were in very small amounts. **Corals:** No significant coral numbers or growth forms were seen on the transects. **Invertebrates:** One species of hermit crab was seen on the transects. A total of 5 species, including banded shrimp, rock crabs, sponges and hydroids, were seen living near and growing on the boat and the mooring lines. **Fish:** Few fishes were seen at this site. Fish that were present included: band-tail goatfish (*Upeneus arge*), blue-spotted cornetfish (*Fistularia commersoni*) and peacock flounder (*Bothus mancus*). Total fish biomass was 0.01 tons per hectare, and the total number of observed fish species was 6.

Survey Station 2: North of the existing pier, on the reef flat adjacent to the former anchoring site of the Carthaginian II. This station consisted of hard calcium carbonate substrate colonized by coral, algae, invertebrates and fish typical of the shallow reef flat around LSBH. Water depth varied from 2 to 3 m at the farthest seaward point. Benthic substrate cover was 40% macro-algae, 21% turf algae, 18% sand, 8% alien algae, 7% crustose coralline algae, 3% coral, and 3% sponge; and rugosity was 8.9, indicating a modest level of substrate complexity. **Algae:** 17 species of algae were observed, the dominant algae were *Amphiroa* sp., *Tolypiocladia glomerulata* and *Halimeda discoidea*. **Corals:** Six species of coral were observed, with the four largest colonies ranging over 160 cm in diameter. Mean frequency of coral colonies was 3.425 colonies per m^2. The most common coral species were *Montipora capitata* and *M. patula*. **Invertebrates:** The invertebrates were mostly echinoderms and mollusks. Five species of trapezid crab were seen in the *Pocillopora* coral heads. **Fish:** A moderate number of fishes were seen at this station. Fish that were present included: band-tail goatfish, Christmas wrasse (*Thalassoma trilobatum*), surgeonfishes (*Acathurus nigroris, A. nigrofuscus, A. olivaceus*, and *A. triostegus*), and lagoon triggerfish (*Rhinecanthus aculeatus*). Total fish biomass was 0.07 tons per hectare, and total number of observed fish species was 18.

Survey Station 3: North and west of the breakwater and continuing from where Survey Station 1 ended. This station consisted of sand that had filled in the channel since the last maintenance dredging had occurred. Water depth varied from 3 to 4 m at the farthest seaward point. Benthic substrate cover was 100% sand and rugosity was 10 indicating that the substrate was flat. **Algae:** Only *Amasia glomerata* was seen on the transects. **Corals:** No significant corals were seen on the transects. **Invertebrates:** Although there were not any visible invertebrates, there were many burrows, indicating the presence of a fairly substantial benthic infauna. **Fish:** No fish were seen at this station, therefore, total fish biomass was 0.0.

Survey Station 4: West of the breakwater and continuing from where Survey Station 3 ended. This station consisted of sand that had filled in the channel since the last dredging had occurred. Water depth varied from 4 to 5 m at the farthest seaward point. Benthic substrate cover was 96% sand, 3% turf algae, and 1% macro-algae; and rugosity was 10, indicating that the substrate was flat. **Algae:** A total of seven alga species were observed, including *Amasia glomerata* and *Spyridia filamentosa*. **Corals:** No significant numbers of corals were seen on the transects. **Invertebrates:** There were far fewer burrows observed here than at survey station 3. There were a total of four species, including a few hermit crabs and brittle stars on the reef edge. **Fish:** Very few fish species were seen at this site. Fish species that were present included Hawaiian humbugs (*Dascyllus albisella*), saddle wrasse (*Thalassoma duperrey*) and reef triggerfish (*Rhinecanthus rectangulus*). Total fish biomass was 0.02 tons per hectare, and total number of observed fish species was 6.

Survey Station 5: Adjacent and parallel to Survey Station 4 but on the reef flat. This station consisted of hard carbonate substrate colonized by coral, algae, invertebrates and fish. Water depth varied from 3 to 4 m at the farthest seaward point. Benthic substrate cover was 34% turf algae, 30% macro-algae, 21% coral, 11% crustose coralline algae, 3% sand, and 1% sponge; and rugosity was 8.7, indicating a modest level of benthic complexity. **Algae:** A total of 23 species of algae were observed, including *A. glomerata*, *H. discodea*, *Gelid* sp., *T. glomerulata*. **Corals:** A total of 9 species of coral were observed. The mean number of coral colonies per transect was 233 (the largest number observed during the surveys), and the resulting mean frequency of coral colonies was 23.275 colonies per m^2. The largest colony sizes ranged between 80 and 160 cm in diameter. The most common coral species was *M. capitata* followed by *Pocillopora eydouxi*. **Invertebrates:** This was an invertebrate rich area with polychaetes, gastropods, zoanthids, hermit crabs, hydroids, sea urchins, and sea cucumbers. Trapezid crabs were observed in the dominant *Pocillopora* coral heads. There was a total of 23 species of macro-invertebrates at this station. **Fish:** There was a wide variety of fishes at this station. Fish present included Hawaiian orbicular velvetfishes (*Caracanthus typicus*), arc-eye hawkfishes (*Paracirrhites arcatus*), blue-eye damselfishes (*Plectroglyphidodon johnstonianus*), wrasses (*Gomphosus varius* and *T. duperrey*), surgeonfishes (*A. nigroris* and *A. olivaceus*), and reef triggerfish (*R. rectangulus*). Total fish biomass was 0.40 tons per hectare, and the total number of observed fish species was 27.

Survey Station 6: On the south side of the channel on the reef flat adjacent to the harbor rock revetment. This station consisted of hard carbonate substrate colonized by coral, algae, invertebrates and fish. Water depth varied from 2 to 3 m. Benthic substrate cover was 39% coral, 33% turf algae, 11% sand, 11% crustose coralline algae, and 6% macro-algae; and rugosity was 7.25, indicating a high level of substrate complexity. **Algae:** 18 species of algae were observed, including *A. glomerata*, *Amphiroa* sp. and *T. glomerulata*. **Corals:** This station was second only to survey station 5 with regard to the richness and abundance of coral, with a total of 7 species of coral and the zoanthid *Palythoa* sp observed. The 6 largest coral colonies (all *Montipora* sp.) ranged over 160 cm in diameter. Mean frequency of coral colonies was 14.675 colonies per m^2. The most common coral species were *M. capitata* and *M. patula*.

Invertebrates: This area was also relatively invertebrate-rich. A total of 21 species were seen at this station, including polychaetes, zoanthids, gastropods, bivalves and hermit crabs, sea urchins, and sea stars. **Fish:** There was a wide variety of fishes at this site. Fish present included goatfishes (*Mulloidichthys vanicolensis* and *Parupeneus bifasciatus*), wrasses (*G. varius* and *T. duperrey*), surgeonfishes (*A. nigrofuscus*, *A. nigroris* and *A. olivaceus*), and the Hawaiian spotted puffer (*Canthigaster jactator*). Total fish biomass was 0.62 tons per hectare, and the total number of observed fish species was 26.

Survey Station 7: On the reef flat adjacent to where the Carthaginian was anchored and near Survey Stations 1 and 2. This station consisted of hard carbonate substrate colonized by coral, algae, invertebrates and fish. Benthic substrate cover was 52% macro-algae, 17% sand, 12% alien algae, 11% turf algae, 4% coralline crustose algae, 3% coral, and 1% sponge; and rugosity was 8.85, indicating modest benthic complexity. **Algae:** A total of 18 species of algae were observed including *Amphiroa* sp., *Gelid* sp., *H. discodea*, *Jania* sp., *Laurencia* sp., and *T. glomerulata*. **Corals:** A total of 5 species of coral observed, with one colony ranging above 160 cm in diameter. Mean frequency of coral colonies was 1.75 colonies per m^2. The most common coral species was *M. capitata* followed by *M. patula*. **Invertebrates:** There were scattered invertebrates consisting mostly of boring sea urchins and small hermit crabs, with other gastropods, spaghetti worms, and banded shrimp present. There was a total of 8 species. **Fish:** There was a moderate number of fish species at this site. Fish present included: Hawaiian sargeants (*Abudefduf abdominalis*), wrasses (*Thalassoma trilobatum* and *T. duperrey*), surgeonfishes (*A. nigrofuscus* and *A. triostegus*), and the lagoon triggerfish (*R. aculeatus*). Total fish biomass was 0.02 tons per hectare, and the total number of observed fish species was 15.

Future Without the Project

It is likely that boat traffic will stay static or continue to slowly increase at LSBH with or without the proposed project. Lahaina Small Boat Harbor is currently the busiest small boat harbor in Hawaii. Without the proposed project, the potential for collisions, oil spills and vessel groundings would be expected to increase as boat traffic increases. A small amount (2,720 ft^2, 253 m^2) of reef flat would not be removed and dredging would not occur in the near future.

DESCRIPTION OF ALTERNATIVES EVALUATED

Alternative 1a. Sheet Pile and Fill at LSBH

This proposed project alternative involves construction of a new ferry pier adjacent to the existing pier at LSBH. A concrete walkway would connect the existing pier to the new pier or to the shoreline. The new pier would be constructed of sheet pile and fill. The area surrounding the new pier and portions of the entrance channel would be dredged. A two-story building would be constructed on the pier to accommodate office and concessions space, public restrooms, and a wrap-around deck. The HEA model was applied to this alternative.

Alternative 1b. Pilings at LSBH

This alternative includes placement of the new pier on concrete pilings. The area surrounding the new pier and portions of the entrance channel would be dredged. The pier would either be secured on top of the pilings or the deck would be constructed out of a molded composite that would float between and be secured by the pilings. The HEA model was applied to this alternative.

Alternative 2: New Pier at Mala Wharf

This alternative includes construction of a new pier at Mala Wharf, which is located one mile north of LSBH. The wharf was constructed in 1922. It is a deep-water docking facility that originally extended approximately 950 ft (290 m) from shore. However, the design failed to protect the wharf from strong currents and high swells, which made docking at the facility hazardous. Shortly after it was built, the wharf was declared unsafe. Existing facilities at Mala Wharf include a boat launching ramp with a protected breakwater, a boat wash-down area, unmarked paved parking area for approximately 34 vehicles, and a comfort station. Currently, the wharf is in serious disrepair and major portions of the wharf are missing or badly damaged. The wharf is currently condemned and gated to prevent public entry. If this alternative is selected, the following would occur: removal of the existing wharf, construction of a concrete walkway and pier, construction of a ferry terminal building and waiting area, construction of offsite parking areas and repavement of an existing parking area, construction of a sewer pump to the new pier, construction of a new individual wastewater system, and extended utility services to the new pier. Since Mala Wharf area is not protected from wave action, a breakwater would have to be constructed so the pier could be used during severe weather conditions. Alternatively, during severe weather conditions, ferry services would be cancelled or relocated to the existing LSBH. The HEA model was not applied to this alternative because no specific construction designs were provided.

Alternative 3: Pier Repair at Ke Kaa Point

Ke Kaa Point is located approximately 4 miles north of Lahaina. An existing pier at the site was constructed around the turn of the century, and it served as the main shipping point for Pioneer Mill's sugar. The pier is located next to Black Rock, a prominent historic Hawaiian site. Ke Ka'a Point is the present location of the Sheraton Maui Resort. If this alternative is selected the following would occur: development of secure public access, extensive repairs of the existing pier, construction of a ferry terminal building and waiting area, installation of pedestrian bridges across existing drainage ditches, and construction of a new parking structure and comfort station. The pier is not protected from wave action and a breakwater would have to be constructed so the pier could be used during severe weather conditions. The HEA model was not applied to this alternative because no specific construction designs were provided.

Alternative 4: No Action

No activities would be undertaken to address harbor congestion and loading and offloading delays. No resources would be lost and no compensatory mitigation would be required. Without

the proposed project, the potential for vessel collisions, oil spills and groundings would be expected to increase as boat traffic increases.

PROJECT IMPACTS

Terrestrial

Alternative 1a: The construction footprint will be in the water. The current shoreline in the LSBH and surrounding area is cement or large boulders. Therefore, there are not expected to be any terrestrial impacts from the proposed project.

Alternative 1b: The construction footprint will be in the water. The current shoreline in the LSBH and surrounding area is cement or large boulders. Therefore, there are not expected to be any terrestrial impacts from the proposed project.

Alternative 2: Most of the construction footprint will be in the water. Currently one side of the shoreline at Mala Wharf is a sand beach and the other is a hardened breakwater. Most of the terrestrial construction will improve existing parking facilities around Mala Wharf.

Alternative 3: Most of the construction footprint will be in the water. Terrestrial impacts would consist of the construction of a parking facility with a comfort station and pedestrian walkways over existing drainage ditches. Minimal impacts may occur to terrestrial species.

Marine

All alternatives currently under consideration are anticipated to result in direct and secondary adverse impacts to marine fish and wildlife resources due to project construction-related activities. These impacts include the direct loss of coral reef resources (including corals, coralline algae, macro-algae, invertebrates) and sand habitat from dredging operations and pier construction and the indirect effects of sedimentation. Coralline algae offer settlement opportunities for coral larvae and stabilize or cement physical reef structures. Coral colonies provide food, shelter and recruitment opportunities for a wide variety of vertebrate and invertebrate species. Certain species of macro-algae found at LSBH serve as food items for sea turtles. Therefore, adverse impacts to coral, coralline algae, and macro-algae may lead to the degradation of the reef and its potential to support certain existing functions such as the provision for foraging habitat for sea turtles, maintenance for coral reef replenishment; provision of habitat for general marine species recruitment, foraging, nesting, and sheltering from predators, as well as foraging habitat for migratory birds. Since the new construction at LSBH will be adjacent to the existing harbor, it is not anticipated that the new construction will affect longshore currents.

Also, construction-related activities will mobilize sediment that may migrate, abrade, settle on, and smother corals, coralline algae, and macro-algae. Corals are particularly vulnerable to suspended sediment, which may inhibit successful reproduction and settlement of larvae, lacerate larval tissue, and result in other lethal affects. The suspension of sediment during project construction activities may result in the temporary degradation of water quality, which may reduce the ability of the coral reef ecosystem to support certain functions such as foraging by sea turtles, coral replenishment, and general marine species recruitment, foraging, nesting, and sheltering from predators. However, appropriate mitigation could be implemented for construction of a new pier at LSBH.

Alternative 1a: Sheet Pile and Fill at LSBH

This alternative would involve construction of a new ferry pier that is 45 feet wide and 120 feet long in the LSBH. A concrete walkway 12 feet wide and 60 feet long would connect the existing pier to the new pier or to the shoreline. The new pier would be constructed of sheet pile with fill and would cover 5,400 ft²). The area surrounding the new pier and portions of the entrance channel would be dredged. Maintenance dredging would cover 17,040 t²f and new dredging would cover 3,920 ft² (20,960 t²f total). Total project impacts would be 26,360 ft².

The following assumptions were made for Alternative 1a and input into the HEA model applications (Appendix C):

Impacts to Reef Flat: 2,720 ft² of reef flat are expected to be permanently removed and changed to sand. Secondary impacts caused by sedimentation from dredging activities are estimated to impact a 10-ft-wide area along the north side (reef flat side) of the channel (total area of band is 950 ft²). This 10-ft-wide area is an estimate based on conversations with construction experts and expected dredging techniques (Darren Mingle, pers. comm. February 14, 2006). Coral reef resources within this area are expected to be reduced to 80% of the baseline services based on expected dredging techniques and expert opinion (Dave Gulko, pers. comm.). Impacts will be greatest next to the dredging activities and decrease outward. Recovery within the band to 100% of the baseline services is expected to take 15 years (D. Gulko, pers. comm.). Net Loss to Reef Flat: 89,281 ft² years.

Impact to Sand: The sheet pile and fill would cover and cause the permanent loss of 5,020 ft² of sand habitat. The dredging would remove sand covering 17,040 ft². Maintenance dredging of this area is expected to occur every 10 years. The dredged reef flat would change to sand, thereby adding 2,720 ft² of new sand habitat. The sand community is expected to return to 100% of lost resource services within 6 months after dredging has stopped (Julie Brock pers. comm.). Net Loss to Sand: 166,155 ft² years.

Impacts to Cement Piling Community: 14 pilings (24-in diameter) and their associated reef communities would be removed and replaced by sheet pile. It is not expected that organisms would grow on the new metal sheet pile. Net Loss to Cement Piling Community: 17,080 ft² years.

Alternative 1b: Pilings at LSBH

This alternative involves placement of a new pier on concrete pilings. Each piling would impact 3.14 ft², and 100 pilings would be required, thereby impacting 314 ft² of sand. Maintenance

dredging of sand would cover 21,100 ft² and new dredging of reef flat would cover 2,720 ft² (23,820 ft² total). Total project impacts would be 24,134 ft².

The following assumptions were made for Alternative 1b and were input into the HEA model applications (Appendix C).

Impacts to Reef Flat: 2,720 ft² of reef flat are expected to be permanently removed and changed to sand. Secondary impacts caused by sedimentation from dredging activities are estimated to impact a 10-ft-wide band along the north side (coral reef side) of the channel (total area of band is 950 ft²). Coral reef resources in this 10-ft-wide band are expected to be reduced to 80% of the baseline services. Recovery within the band to 100% of the baseline services is expected to take 15 years. Net Loss to Reef Flat: 89,281 ft² years.

Impacts to Sand: Dredging would remove sand covering 21,100 ft². A total of 100 new pilings would replace 14 old pilings. The diameter of each piling is 24 in. Therefore, 270 t²f of sand habitat would be lost due to the installation of 84 new piles. Total affected dredged sand habitat will be 20,830 ft². Dredging of this area is expected to occur every 10 years. The dredged reef flat will change to sand, thereby adding 2,720 ft² of new sand habitat. The sand community is expected to return to 100% of lost baseline resource services within 6 months after dredging has stopped. Net Loss to Sand: 116,845 ft² years.

Impacts to Concrete Piling Community: 14 concrete pilings would be removed. Each piling has a diameter of 24 in. A biological community was found growing within a six-foot vertical section of the pilings, delineated on the top of the pilings by the low tide and wave action and on the bottom by sediment impacts. Therefore, 528 ft² of piling community would be removed. A total of 100 new concrete pilings (each 24 in diameter) will create 3770 ft² of new habitat. This habitat should achieve 100% of lost baseline services in 30 years (Dave Gulko pers. comm.). Net Gain to Cement Piling Community: 60,309 ft² years.

Alternative 2: New Pier at Mala Wharf

No proposed designs were provided for construction at Mala Wharf, however, some general observations on impacts were provided in the Site Location and Design Alternatives document (Munekiyo and Hiraga, Inc., 2005). This document identifies the need to remove the existing derelict pier and dredge a turning basin and entrance channel. No estimates of the area to be impacted are available. The coral reef resources at Mala Wharf are extensive. The DLNR estimated that directly underneath the existing pier, coral cover is less than 10% however, immediately adjacent and extending along the coast line, coral cover increases to 80-90% (Munekiyo and Hiraga Inc., 2005). It is expected that direct and indirect impacts to marine resources would be significant although additional information would need to be collected in order to fully evaluate possible impacts. The HEA model was not applied to this alternative because no proposed project impact estimates were available.

Alternative 3: Pier Repair at Ke Ka'a Point

No proposed designs were provided for construction at Ke Ka'a Point, however, some general observations on impacts were provided in the Site Location and Design Alternatives document (Munekiyo and Hiraga, Inc., 2005). This document identifies the need to remove the existing pier, dredge a turning basin and entrance channel and build a breakwater 550 ft long. Existing marine conditions include a rocky shoreline next to the existing pier that quickly drops off to a sandy bottom. Live coral cover is less than 10% near the existing pier and hard pavement type substrate along the north edge of the pier has approximately 10-15% coral cover (Munekiyo and Hiraga Inc., 2005). Not enough information is provided to fully evaluate the impacts of this alternative on the marine environment. The HEA model was not applied to this alternative because no proposed project impact estimates were available.

In summary, we anticipate that a small amount of coral reef resources and associated ecological functions would be lost or diminished as a result of project-related construction and dredging activities. This may be partly offset by the addition of hard substrate (sheet pile or pilings) and by implementation of the compensatory mitigation actions proposed below. Adverse impacts to the terrestrial environment are not expected to be significant.

FISH AND WILDLIFE SERVICE RECOMMENDATIONS

The Service shares jurisdiction with the NMFS over federally listed threatened green sea turtles and endangered hawksbill sea turtles. The Service has lead jurisdiction over these species when they are on shore, and the NMFS has lead jurisdiction over these species when they are in the ocean. Based on information from the Hawaii DAR, sea turtles are not currently known to nest at the proposed project site. However, they are abundant in the waters surrounding the LSBH, and they use this area for foraging and resting. Therefore, the Service recommends that the FTA consult with NMFS regarding potential project-related effects to sea turtles.

Compensatory Mitigation

As stated earlier, HEA modeling assesses information regarding the amount of impacts and scales the compensatory mitigation to offset these impacts. Impacts to the marine environment can sometimes be reduced by design features of the proposed construction, and therefore, reduce the amount of compensatory mitigation necessary to offset the impacts (e.g. Alternative 1b: Pilings at LSBH would have a net increase of 84 pilings, thus increasing the availability of this habitat). The HEA model was applied to three habitat areas (sand, piling, and reef flat) for alternatives 1a and 1b. The results of each application describes the losses or gains and, if appropriate, the recommended compensatory mitigation for the three different habitats modeled.

Sand

In both alternatives 1a and 1b, 2,720 ft² of reef flat would be dredged and replaced by sand habitat. For Alternative 1a, taking into account the sand habitat lost due to the sheet pile and fill (5,020 ft²) and the maintenance dredging of 17,040 ft² every 10 years, there would be a net loss of 166,155 ft² years of sand habitat. However, for Alternative 1b, taking into account the sand habitat lost due to the installation of 100 piles (270 ft²) and the maintenance dredging of 20,830

ft² every 10 years, there would be a net loss of 33,953 ft² years of sand habitat. Alternative 1b reduces the impacts to the sand by 132,202 ft² years. Recently dredged sand habitat is thought to be repopulated on a relatively short time scale. In general, within six months to one year, newly created sand should provide close to 100% of the baseline services provided prior to being dredged (Dr. Julie Brock, pers. comm.). Due to the apparent quick recovery time for sand habitats, if this alternative is selected, no additional compensatory mitigation would be required to offset the loss of sand habitat.

Pilings

In both alternatives 1a and 1b, the 14 existing cement pilings and associated community would be removed, affecting 528 ft² of this habitat type. In Alternative 1a, the new pier (45ft x 120ft) would be constructed of metal sheet pile and fill, producing 32,400 ft² of surface area. Based on discussions with experts, this area is not expected to provide any ecological benefits to offset the loss of the cement piling community. Therefore, there would be a net loss of 17,080 ft² years of this habitat. In Alternative 1b, 100 new cement pilings would provide 3,770 ft² of new habitat. Based on expert opinion, these new pilings would provide 100% of cement piling community services in 30 years. This results in a net gain of 60,309 ft² years for the cement piling community.

Reef Flat

In both alternatives 1a and 1b, 2,720 ft² of reef flat community would be permanently removed. No proposed project designs would produce in-kind habitat, therefore, compensatory mitigation is recommended. If appropriately implemented and managed, one compensatory mitigation scenario could offset the construction-related impacts. On October 31, 2004, a single-masted vessel, the "Dolphin," ran aground a few hundred yards north of LSBH. Total estimated damage from the grounding covers approximately 4,100 ft² and 100% of the ecological services in the affected area were lost. The Dolphin is still fast aground. The following parameters were used to determine whether removal of the vessel and restoration of the grounding scar would offset the construction-related losses. Once the Dolphin is removed and the scar is cleared of loose rubble, all corals and invertebrates from the 2,720 ft² area to be dredged would be transplanted to the grounding scar. Coral mortality is expected to be 30% over the first year, but coral recruitment and growth of the transplanted invertebrates are expected to return the scar to 100% of services in 35 years, which is the maximum estimated age of corals in the area to be dredged. If these assumptions are met, the mitigation site would provide a net gain of 15,742 ft² years of reef flat habitat. Therefore, the Service recommends the removal of the vessel and restoration of the grounding scar as compensatory mitigation for the project-related loss of 2,720 ft² of reef flat. For both alternatives 1a and 1b, we recommend that corals and other invertebrates be transplanted from the area to be dredged to the grounding scar and that this area be managed to provide for the long-term survival of resources at this mitigation site. Based on the results of HEA model applications, Alternative 1b would offset more of the construction-related impacts to sand, piling, and reef flat habitat than would Alternative 1a.

Comparison of Project-Related Habitat Impacts for Alternatives 1a and 1b

Habitat	Alternative 1a: Sheet Pile and Fill	Alternative 1b: Pilings
Sand	Loss of 166,155 ft^2 years	Loss of 33,952 ft^2 years
Piling	Loss of 17,080 ft^2 years	Gain of 60,309 ft^2 year
Reef Flat	Gain of 15,742 ft^2 years	Gain of 15,742 ft^2 years

Ensuring Success of Implemented Compensatory Mitigation

Based on the recent past, the effectiveness of compensatory mitigation to offset proposed project-related impacts to coral reefs from federally permitted or funded projects is below 50% (U.S. Fish and Wildlife Service, 2003). We have recommended the following structured process to increase the effectiveness of compensatory mitigation: (1) Document the anticipated area of impact; (2) Assess the resources anticipated to be impacted; (3) Correlate the anticipated impacts with the compensatory mitigation; (4) Scientifically monitor the compensatory mitigation; (5) Establish performance standards; and (6) Determine the effectiveness of implemented compensatory mitigation with long-term monitoring (Service 2003). Recent Corps guidance has provided a more structured compensatory mitigation process that is intended to produce compensatory mitigation projects that more effectively replace permanently lost coral reef resources from project-related impacts. This guidance is found in the following documents: Regulatory Guidance Letter 02-2 Subject: Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 (RGL 02-2); the Corps Memorandum to the Field entitled, Model Compensatory Mitigation Plan Checklist for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 4004 of the Clean Water Act and Section 10 of the Rivers and Harbors Act (Corps 2004) and Public Notice 200400448, Special Public Notice: Honolulu District Compensatory Mitigation and Monitoring Guidelines (Corps 2005). The Corps requires a mitigation plan be submitted as part of the supporting documentation for the permit application process (PN 200400048) and, therefore, a mitigation plan should be completed prior to construction.

This draft FWCA report addresses the first three steps of the structured process outlined above (Service 2003). We recommend that steps 4-6 of the structured process be detailed in a written Compensatory Mitigation Plan (also required by the Corps) that is completed before construction begins and is coordinated with the involved agencies (Service, DLNR, NOAA, FTA and EPA). The completion of these steps will increase the likelihood that the implemented compensatory mitigation will effectively offset the anticipated project-related impacts to the marine community. We recommend that the following be included as part of the Compensatory Mitigation Plan.

Scientific Monitoring of Compensatory Mitigation

The Service recommends that a post-construction assessment of the marine environment in the vicinity of the LSBH project be conducted. The marine assessment should evaluate the coral reef community in the vicinity of the dredging operation to ensure that the primary and secondary project-related impacts occurred as anticipated during the planning phase of this project. Post construction surveys are important because they provide information on whether

actual project-related impacts are greater or less than the anticipated project-related impacts. If there are appreciable differences, the compensatory mitigation can be recalculated so that it is appropriately scaled to the actual project-related impacts.

We recommend that valid scientific methods be used to monitor compensatory mitigation actions. Monitoring of compensatory mitigation sites can show whether the anticipated recovery trajectory is actually occurring and this allows for adaptive management of mitigation sites to manage recovery if significant factors arise (*e.g.*, algal invasions, high mortality of transplanted corals, ongoing damage to transplanted corals by loose rubble from the grounding etc.).

Performance Standards for Compensatory Mitigation

The Service recommends that:

(1) Monitoring be implemented and confirmation be obtained to show that the transplanted corals are surviving above the 70% level.

(2) Monitoring be implemented and confirmation be obtained to show that new coral recruits have settled in the mitigation site at densities that mirror the environment outside the mitigation site.

(3) Long-term monitoring be implemented and confirmation be obtained to show that the mitigation site has replaced the services lost as a result of project-related impacts.

Effectiveness of Implemented Compensatory Mitigation

The Service recommends that:

(1) Long-term monitoring occur (for a total period of 35 years) at frequent enough intervals to ensure that if the mitigation site is not proceeding along the expected recovery trajectory, management decisions can be made to improve the mitigation site.

(2) An adaptive management plan be written and approved by all parties involved.

(3) Financial assurances are obtained to ensure that the compensatory mitigation project is implemented.

Best Management Practices: Impact Avoidance and Minimization

The Service recommends that the following measures be incorporated into the project to minimize the degradation of water quality and impacts to fish and wildlife resources:

(1) Turbidity and siltation from project-related work shall be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions;

(2) Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods. The most abundant corals at Lahaina were *Montipora*. This coral spawns around the new moon in June and July. Dredging activities should not occur the week before and the week after the new moon in June and July (D. Gulko, pers. comm. 3/17/06).

3) Dredging and filling in the marine/aquatic environment shall be designed to avoid or minimize the loss to special aquatic site (i.e., coral reef) habitats and the unavoidable loss of such habitat shall be compensated for;

(4) All project-related materials and equipment (dredges, barges, backhoes etc) to be placed in the water shall be cleaned of pollutants prior to use;

(5) No project-related materials (fill, revetment rock, pipe etc.) should be stockpiled in the water (intertidal zones, reef flats etc.);

(6) All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site;

(7) No contamination (trash or debris disposal, alien species introductions etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean etc.) shall result from project-related activities; and

(8) Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.

SUMMARY OF FISH AND WILDLIFE SERVICE POSITION

The reef flats protecting Lahaina, Maui, have been identified as the habitat of major concern for the proposed project. Coral reef ecosystem organisms (*e.g.*, reef fishes, corals, macro-invertebrates, algae, sea turtles, and migratory birds) that occur at these locations provide a set of ecological functions. The institutional significance of U.S. coral reefs has been established through their designation as Special Aquatic Sites [40 CFR Part 230 §230.44/FR v.45n.249] and as a Federal Trust Resource [Executive Order (E.O.) 13089]. To various degrees, the reef flats around Lahaina provide habitat that promote specialized ecological functions, which include species recruitment, foraging, nesting, and sheltering from predators and habitat for the federally listed green and hawksbill sea turtles. Reef flats support other ecological functions by providing shoreline protection from oceanic swells and storm events; significant sources of larvae/juveniles to promote species replenishment; prey items for federally protected migratory birds; and opportunities for human activities such as subsistence harvest/fishing, recreation, tourism and cultural practices.

The reef flats and adjacent sand communities may be negatively impacted due to implementation of the proposed project. The HEA model applications provide a quantitative analysis of project-related impacts and provide scaled compensatory mitigation actions to offset these impacts. Recent Corps guidance: RGL 02-2, PN 200400448 and the 2005 Memorandum to the Field provide a decisional and management framework to increase the likelihood that implemented compensatory mitigation offsets project-related impacts to coral reef resources. The Service

recommends that the project proponent develop a compensatory mitigation plan that addresses potential project impacts identified in this report. To assist in the development of this plan, we have provided a set of activities that could be implemented to minimize adverse impacts and compensate for lost habitat and ecological functions as a result of the proposed project.

From a resource conservation perspective, the selection of Alternative 1b, the new pier on cement pilings option, would result in the least amount of anticipated adverse impacts to fish and wildlife resources. The Service maintains that implementation of the proposed project including the conservation recommendations and compensatory mitigation in this report would minimize unavoidable impacts and avoid unnecessary impacts to biological resources. Any changes to the proposed project plan or to the recommendations in this report will require additional coordination with the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii.

REFERENCES

AECOS, Inc. 2005. Marine biological and water quality survey of Lahaina Small Boat Harbor, Lahaina, Maui.

Crosby, M., S. Drake, C. Eakin, N. Fanning, A. Patterson, P. Taylor, and J. Wilson. 1995. United Stated Coral Ref Initiative: An overview of the fist steps. Coral Reefs (1995) 14:1-3.

Federal Register. 1981. U.S. Fish and Wildlife Mitigation Policy. Vol. 46, No. 15, 1/23/81.

Hawaii Division of Aquatic Resources. 2001. Reef Renewal: Hawaii's Unique Coral Spawning Events. Brochure produced by the Hawaii Division of Aquatic Resources.

King, D.M., and K.J. Adler. 1991. Scientifically Defensible Compensation Ratios for Wetland Mitigation. Washington, D.C. U.S. Environmental Protection Agency.

EKNA Services, Inc., 2005. Final Report: Oceanographic Design Criteria and Coastal Engineering Assessment for Proposed Ferry Pier Lahaina Boat Harbor, Maui, Hawaii.

Friedlander, A.M., G. Aeby, E. Brown, A. Clark, S. Coles, S. Dollar, C. Hunter, P. Jokiel, J. Smith, B. Walsh, I. Williams, and W. Wiltse. 2005. The State of Coral Reef Ecosystems of the Main Hawaiian Islands. Pp 222-269. In: J. Waddell (ed.), The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005. NOAA Technical Memorandum NOS NCCOS 11 NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp.

Munekiyo and Hiraga, Inc. 2004. Environmental Impact Statement Preparation Notice. Proposed Lahaina Small Boat Harbor Ferry Pier Improvements. Prepared for the State of Hawaii, Department of Land and Natural Resources.

Munekiyo and Hiraga, Inc. 2005. Site Location and Design Alternatives. Propose Inter-Island Ferr Pier Improvements at West Maui, Hawaii. Prepared for the State of Hawaii, Department of Land and Natural Resources.

Turgeon, D., R. Asch, B. Causey, R. Dodge, W. Jaap, K. Banks, J. Delaney, B. Keller, R. Speiler, C. Matos, J. Garcia. E. Diaz, D. Catanzaro, C. Rogers, Z. Hillis-Starr, R. Nemeth, M. Taylor, G. Schmahl, M. Miller, D. Gulko, J. Maragos, A, Friedlander, C. Hunter, R. Brainard, P. Craig, R. Richmond, G. Davis, J. Starmer, M. Trianni, P. Houk, C. Birkeland, A. Edward, Y. Golbus, J. Guttierez, N. Idechong, G. Paulay, A. Tafileichig, and N. Vandervelde. 2002. The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2002. National Oceanic and Atmospheric Administration/National Ocean Service/National Centers for Coastal Ocean Science, Silver Spring, MD.

U.S. Army Corps of Engineers. 2002. Regulatory Guidance Letter 02-2. Subject: Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory

Program Pursuant to Section 404 of the Clean Water Act and Section 10 Of the Rivers and Harbors Act.

U.S. Army Corps of Engineers. 2004. Memorandum to the Field. Subject: Model Compensatory Mitigation Plan Checklist for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 Of the Rivers and Harbors Act.

U.S. Army Corps of Engineers. 2005. Public Notice Number 200400448. Special Public Notice, Honolulu District Compensatory Mitigation and Monitoring Guidelines.

U.S. Coral Reef Task Force. 2000. The National Action Plan to Conserve Coral Reefs. U.S. Coral Ref Task Force, Washington. D.C.

U.S. Fish and Wildlife Service. 2003. Compensatory Mitigation for Coral Reef Impacts in the Pacific Islands-Final Report. USFWS, Pacific Islands Fish and Wildlife Service, Honolulu, Hawaii.

Waddell, J.E. (ed.). 2005. The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005. NOAA Technical Memorandum NOS NCCOS 11 NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp.

Table 1. Global Position System Data for seven survey sites at Lahaina, Maui, Hawaii, December 11-14, 2005.

Transect #	To:	Latitude	Longitude	From:	Latitude	Longitude	Date
1		20.872048	-156.679412		20.872248	-156.67894	12/11/2005
2		20.872334	-156.678911		20.872314	-156.67936	12/11/2005
3		20.872001	-156.67944		20.871668	-156.67977	12/12/2005
4		20.871553	-156.679931		20.871245	-156.68031	12/12/2005
5		20.87133	-156.680335		20.871638	-156.68009	12/12/2005
6		20.871659	-156.679363		20.871341	-156.67968	12/12/2005
7		20.872293	-156.679306		20.87221	-156.67953	12/14/2005

Note: Data collected in UTM Zone 4, WGS 84

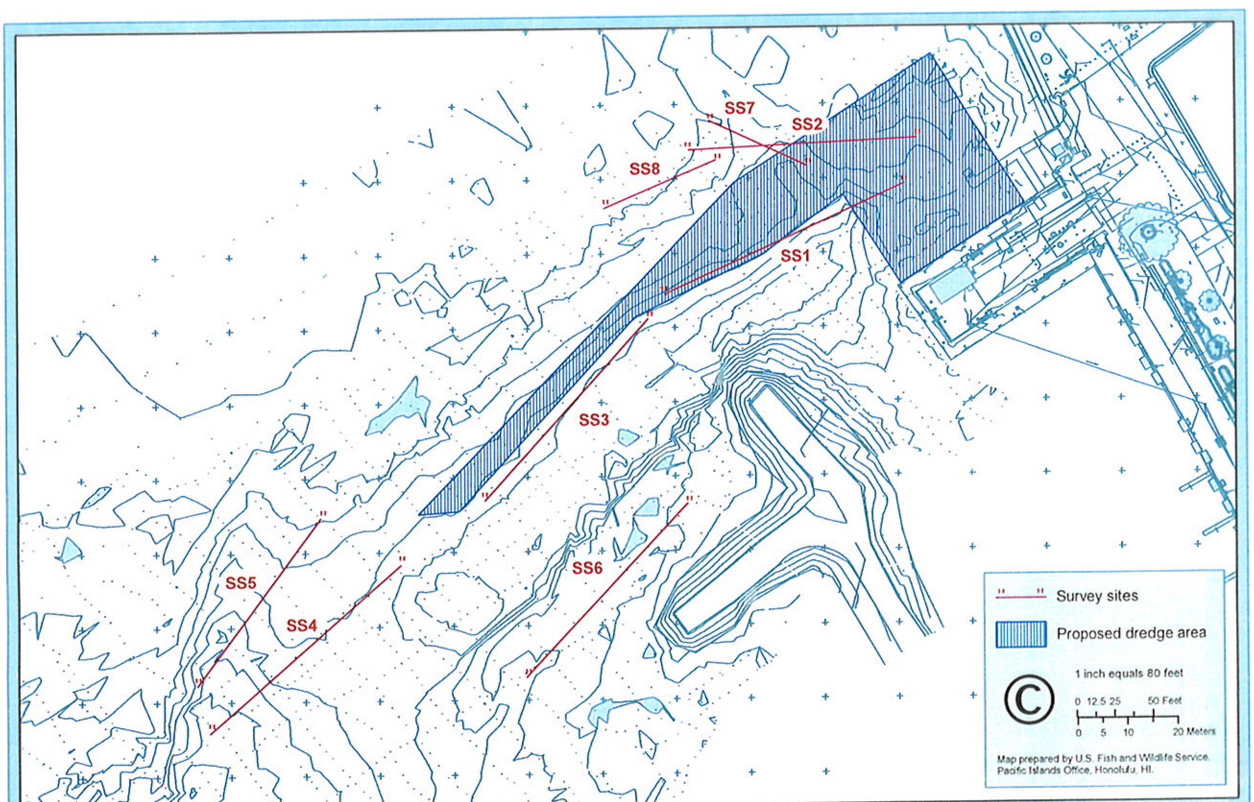


Figure 1. Lahaina Harbor with proposed dredge sites (blue) and survey sites (ss)

Table 2. Percent benthic substrate cover and algal diversity for seven survey sites at Lahaina, Maui, Hawaii. December 11-14, 2005.

FUNCTIONAL GROUPS	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7
Coralline Crustose Algae		7.08			10.83	10.83	3.75
Turf	1.25	21.25		3.33	34.17	33.33	11.25
Sand	98.33	18.33	100	96.25	3.33	11.25	16.67
Sponge		2.5			0.42		0.83
Macro- Algae	0.42	47.93		0.42	30.42	5.43	64.18
Coral	0	2.92	0	0	20.83	39.17	3.34

MACRO-ALGAE SPECIES							
Acanthophora spicifera		8.33					12.5
Amansia glomerata				0.42	8.75	1.67	
Amphiroa sp.		14.58			2.5	2.92	7.92
Asparagopsis taxiformis					0.42		
Bryopsis sp.					0.42		
Caulerpa webbiana					1.67		
Champia parvula							0.42
Cladophora sp.							0.42
Cladophoropsis herpestica		1.25					0.83
Crouania sp.							0.42
Dictyota sp.					0.42		0.42
Dictyota sandvicensis		1.67					7.92
Gelid.	0.42	12.5			4.58	0.42	11.67
Gracilaria coronopifolia							0.83
Griffithsia heteromorpha		0.42					0.42
Halimeda discodea		2.08			4.58		8.33
Herposiphonia sp.					0.83		1.25
Phyllodictyon anastamosans					0.83		
Jania sp.		1.67					5.42
Laurencia sp.		0.42			0.42		2.08
Microdictyon setchellianum		0.42					
Neomeris annulata					0.42		
Peyssonnelia sp.		0.42					
Spirocladia hodgsoniae					2.5		
Tolypiocladia glomerulata		4.17			2.08	0.42	3.33

Table 3. Invertebrate species observed for seven survey sites at Lahaina, Maui, Hawaii. December 11-14, 2005.

Family	**Survey Sites**						
Genus species	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Terebellidae							
Lomia medusae		X			X	X	X
Terebellids				X			
Serpulidae							
Spirobranchus giganteus					X	X	
Serpulids		X					
Zoanthidae							
Palythoa caesia					X	X	
Protopalythoa sp.						X	
Hydroida							
Pennaria disticha					X		
Hipponidae							
Hipponix imbricatus		X					
Conidae							
Conus ebraeus					X		
C. flavidus							X
C. imperialis		X					
C. lividus					X	X	
C. leopardus						X	
Vermtidae							
Serpulorbis variabilis		X			X	X	
Neritidae							
Neritidae (shell only)			X				
Thaididae							
Morula uva					X	X	
Cerithidae							
Cerithium echinatum					X	X	X
Quoyula monodonta					X	X	

Table 3. continued

Family	Survey Sites						
Genus species	1	2	3	4	5	6	7
Cypraeidae							
Cypraea caputserpentis						X	
C. mauritiana						X	
Mollusca-Bivalvia							
Isogonomon perna		X				X	
Pincta marginifera						X	
Dendrodorididae							
Dendrodoris sp.						X	
Pleurobranchidae							
Pleurobranchia sp.		X					
Stenopodidae							
Stenopus hispidus							X
Diogenidae							
Calcinus hazletti						X	
C. latens	X	X		X		X	
Dardanus saguinocarpus					X		
Hippolytidae							
Saron neglectus					X		
Alpheidae							
Alpheus lottini					X		
Alpheus sp.			X	X			
Trapeziidae							
Trapezia digitalis					X		
T. ferruginea					X		
T. flavopunctata					X		
T. intermedia					X		
T. tigrina					X		
Xanthidae							
small Xanthidae					X		

Table 3. continued

Family	Survey Sites						
Genus species	1	2	3	4	5	6	7
Enoplometopidae							
Parribacus antarcticus						X	
Grapsidae							
Percnon affine						X	
Ophoicomidae							
Ophiocoma brevipes		X		X			
O. erinaceus		X					X
O. pica		X			X		
Toxopneustidae							
Tripneustes gratilla		X					
Diadematidae							
Echinothrix calimaris		X			X		
E. diadema		X					X
E. mathaei		X				X	X
Holothuriidae							
Holothuria atra					X		
H. pardalis		X					
H. whitmaei					X		
Oreasteridae							
Culcita novaeguineae						X	
Total number of species	1	16	2	4	23	21	7

Table 5. Coral species and size classes observed and density for seven survey sties at Lahaina, Maui, Hawaii. December 11-14, 2005.

	Survey Sites																							
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Transect 1 (a) or Transect 2 (b)	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b
Transect Section (1=1st 10 meter section, 2=2nd 10 meter section)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Coral size class distribution (number per size class per site)																								
Montipora capitata																								
0 - <2 cm																	4	2	3	2				
2 - <5 cm						4	4										54	46	12	6	12	13	7	4
5 - <10 cm						9	2										36	31	17	8	19	18	19	20
10 - <20 cm					3	7	3										24	13	10	8	11	18	38	19
20 - <40 cm					1	6	2										6	4	4	5	7	34	20	7
40 - <80 cm						6	5										2			3	4	20	12	5
80 - <160 cm						3	5										1				4	6	1	2
> 160 cm						2	2														2	2	1	
Montipora patula																								
0 - <2 cm																	2	2	2		1			
2 - <5 cm						3	1										13	12	23	3	2	3	4	
5 - <10 cm						2	2										18	14	19	3	9	10	6	7
10 - <20 cm						4	1										16	16	11	3	9	8	14	13
20 - <40 cm						4	3										8	8	5	6	8	7	18	3
40 - <80 cm						4	2										6	2	1	1	5	3	6	
80 - <160 cm						2	1														1	1	1	
> 160 cm																					1			

Table 4. Key mollusc and echinoderm relative abundance data for the seven survey sites at Lahaina, Maui, Hawaii. December 11-14, 2005.

Phylum	**Survey Sites**						
Genus/species	1	2	3	4	5	6	7
	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)	Relative Abundance (avg/m^2)
Mollusca							
Cone							0.2
Other Mollusc							0.2
Echinodermata-Echinoids							
Echinothrix diadema		0.4					2.6
Tripneustes gratilla		0.2			0.4	0.2	
Echinometra oblonga							
Echinometra mathaei		2.4				0.2	3.8
Echinodermata-Holothuroids							
Holothuria atra					0.2		
Holothuria whitmaei					0.4		
Other Holothuroid		0.2					
Echinodermata-Asteroidea							
Culcita novaeguineae						0.2	
Trapezid crabs		0.2			4.6	1.2	
Stenopus hispidus							0.4

Table 5. continued

	Survey Sites																							
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Transect 1 (a) or Transect 2 (b)	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b
Transect Section (1=1st 10 meter section, 2=2nd 10 meter section)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Pocillopora eydouxi																								
0 - <2 cm																								
2 - <5 cm						1											8		1					
5 - <10 cm																	7	5	8				4	
10 - <20 cm																	16	12	24	6		3	4	2
20 - <40 cm						2											14	41	28	9		4	14	2
40 - <80 cm						2											6	7	6	2		1	9	
80 - <160 cm																								
> 160 cm																								
Pocillopora meandrina																								
0 - <2 cm																		1		1				1
2 - <5 cm																	7	3	3	3				1
5 - <10 cm							1										4	11	6				1	2
10 - <20 cm						2	2										7	13	5	8		2		1
20 - <40 cm						1	1										2	4	2	5	1		3	1
40 - <80 cm							1										1		1					
80 - <160 cm																								
> 160 cm																								
Porites compressa																								
0 - <2 cm																								
2 - <5 cm																								
5 - <10 cm																	1				1			1
10 - <20 cm																					2		1	
20 - <40 cm																								
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								

Table 5. continued

	Survey Sites																							
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Transect 1 (a) or Transect 2 (b)	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b
Transect Section (1=1st 10 meter section, 2=2nd 10 meter section)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Montipora flabellata																								
0 - <2 cm																								
2 - <5 cm																								
5 - <10 cm																								
10 - <20 cm																			1					
20 - <40 cm																								
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								
Leptastrea purpurea																								
0 - <2 cm																								
2 - <5 cm																								
5 - <10 cm																		1						
10 - <20 cm																		2						
20 - <40 cm																		2						
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								
Pocillopora damicornis																								
0 - <2 cm																								
2 - <5 cm						10																		
5 - <10 cm						8	1																	
10 - <20 cm						3																		
20 - <40 cm																								
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								

Table 5. continued

	Survey Sites																						
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Transect 1 (a) or Transect 2 (b)	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b
Transect Section (1=1st 10 meter section, 2=2nd 10 meter section)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
FRAGMENTS (all species)																								
0 - <2 cm																								
2 - <5 cm						3																		
5 - <10 cm																								
10 - <20 cm																								
20 - <40 cm																								
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								
Totals for all anthozoans in each size class per site																								
0-5 cm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	5	3	3	0	0	1
5-10 cm	0	0	0	0	0	18	5	0	0	0	0	0	0	0	0	0	84	77	41	12	19	18	11	5
10-20 cm	0	0	0	0	0	21	8	0	0	0	0	0	0	0	0	0	79	69	58	13	30	31	33	31
20-40 cm	0	0	0	0	3	19	7	0	0	0	0	0	0	0	0	0	76	72	62	30	24	34	70	39
40-80 cm	0	0	0	0	1	14	6	0	0	0	0	0	0	0	0	0	39	75	46	28	18	48	66	14
80-160 cm	0	0	0	0	0	12	8	0	0	0	0	0	0	0	0	0	21	13	8	7	10	25	30	5
> 160 cm	0	0	0	0	0	5	6	0	0	0	0	0	0	0	0	0	1	0	1	0	5	7	2	2
TOTAL	0	0	0	0	4	89	40	0	0	0	0	0	0	0	0	0	306	311	221	93	109	163	212	97
POPULATION PARAMETERS																								
Mean frequency: no/m2	0.0	0.0	0.0	0.0	0.4	8.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.6	31.1	22.1	9.3	10.9	16.3	21.2	9.7
Total anthozoan genera:	0.0	0.0	0.0	0.0	1.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0
Mean diversity: anthozoan genera/m2	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3
Total scleractinian species:	0	0	0	0	1	6	5	0	0	0	0	0	0	0	0	0	6	7	6	6	6	7	7	6
Total scleractinian genera:	0	0	0	0	1	3	3	0	0	0	0	0	0	0	0	0	3	4	3	3	4	4	3	3
Area surveyed, m^2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Table 5. continued

	Survey Sites																						
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Transect 1 (a) or Transect 2 (b)	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b	a	a	b	b
Transect Section (1=1st 10 meter section, 2=2nd 10 meter section)	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Porites evermanni																								
0 - <2 cm																								
2 - <5 cm																		4				2		
5 - <10 cm																				1			1	
10 - <20 cm																		1					1	
20 - <40 cm																							1	
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								
Porites lobata																								
0 - <2 cm																					2			
2 - <5 cm																	2	12	2		5			
5 - <10 cm						2	2										13	7	8	1	1	1	2	1
10 - <20 cm						3	1										13	15	11	5	1	3	12	4
20 - <40 cm						1											9	16	7	3	2	3	10	1
40 - <80 cm																	6	4		1	1	1	3	
80 - <160 cm																			1					
> 160 cm																								
Palythoa sp.																								
0 - <2 cm																								
2 - <5 cm																								
5 - <10 cm																						2		
10 - <20 cm																					1			
20 - <40 cm																								
40 - <80 cm																								
80 - <160 cm																								
> 160 cm																								

Table 6. Reef fish diversity and biomass for seven survey sites at Lahaina, Maui, Hawaii. December 11-14,2005.

FAMILY	Survey Sites						
Genus species	1	2	3	4	5	6	7
OPHICHTHIDAE							
Callechelys lutea				X			
AULOSTOMIDAE							
Aulostomus chinensis							
FISTULARIIDAE							
Fistularia commersonii	X					X	
SCORPAENIDAE							
Scorpaenopsis cacopsis						X	
Sebastapistes coniorta		X			X	X	
CARACANTHIDAE							
Caracanthus typicus					X		
SERRANIDAE							
Cephalopholis argus		X					
CIRRHITIDAE							
Paracirrhites arcatus					X		
P. forsteri						X	
CARANGIDAE							
Scomberoides lysan						X	
MULLIDAE							
Mulloidichthys vanicolensis						X	
Parupeneus bifasciatus					X	X	
P. cyclostomus				X			
P. multifasciatus					X		
P. porphyreus						X	
Upeneus arge	X	X					

Table 6. continued

FAMILY	Survey Sites						
Genus species	1	2	3	4	5	6	7
CHAETODONTIDAE							
Chaetodon auriga		X				X	X
C. lunula		X				X	X
C. lunulatus							
C. miliaris							
C. quadrimaculatus		X					
C. unimaculatus						X	
POMACENTRIDAE							
Abudefduf abdominalis		X			X		
A. vaigiensis							X
Chromis vanderbilti					X	X	
Dascyllus albisella				X			
Plectroglyphidodon johnstonianus					X	X	
P. imparipennis					X		
Stegastes fasciolatus					X	X	
LABRIDAE							
Gomphosus varius					X	X	
Labroides phthirophagus						X	
Stethojulis balteata		X			X	X	X
Thalassoma duperrey		X		X	X	X	X
T. trilobatum		X			X		X
SCARIDAE							
Chlorurus sordidus							
Scarus psittacus					X	X	
BLENIIDAE							
Cirripectes vanderbilti						X	
Exallias brevis					X		
ZANCLIDAE							
Zanclus cornutus					X		

Table 6. continued

FAMILY	Survey Sites						
Genus species	1	2	3	4	5	6	7
ACANTHURIDAE							
Acanthurus olivaceus		X			X	X	X
A. blochii					X		X
A. dussumieri					X		
A. leucopareius					X		
A. nigrofuscus		X				X	X
A. nigroris		X			X	X	
A. triostegus		X					X
Ctenochaetus strigosus							
Naso brevirostris					X		
N. lituratus	X				X	X	
N. unicornis	X						
BOTHIDAE							
Bothus mancus				X			
BALLISTIDAE							
Melichthys niger							
Rhinecanthus aculeatus		X					X
R. rectangulus				X	X		
MONACANTHIDAE							
Cantherhines dumerilii		X					X
C. sandwichiensis					X		
TETRAODONTIDAE							
Arothron meleagris							
Canthigaster. amboinensis		X				X	X
C. jactator	X	X			X	X	X
Total number of families	4	10	0	6	13	12	7
Total number of species	5	18	0	6	27	26	14
Total fish biomass in tons/hectare	0.01	0.07	0	0.02	0.4	0.62	0.02

APPENDIX A

Lahaina, Maui, Hawaii
Rapid Ecological Assessment Survey Protocols

The survey protocols that were used in this investigation included the following general protocol, which applied to all survey divers. This protocol was extensively modified after the original, which was developed for use in remote areas of the Northwestern Hawaiian Islands (Maragos & Gulko, 2002). This general protocol was revised by Antonio Bentivoglio on December 15, 2004, and is based on information from Dave Gulko, Alan Friedlander, and Ryan Okano.

Fish Survey Protocols:

The fish team consisted of one diver swimming two 25-meter (m) belt transects per dive and collecting data on all species observed. Random swims were conducted in areas between transect lines and after timed transect swims were completed.

25-m Belt Transects:
During the deployment leg of the transect line, the diver recorded size-class-specific (Total Length, TL) counts of all fishes greater than 20 centimeters (cm) within 2 m on each side of the line, while small and cryptic fish (*i.e.*, less than 20 cm) were counted within 1 m on each side of the line during the "swim-back" leg. The total length of each fish within the transect area was estimated and put into a size class. Size classes were 1, 2, 3, 4, 5, 6-10, 11-15, and 16-20 cm. Total length of fish larger than 20 cm was estimated in 5 cm increments (25, 30, 35, 40, etc…). The diver obtained a density estimate of all fishes > 20 cm Total Length (TL) within a 25-m long x 4-m wide (100-m^2) area on an initial ("swim-out") leg, followed by a density estimate of fishes ≤ 20 cm TL within a 25-m long x 2-m wide (50-m^2) area on the subsequent ("swim back") leg, on each of the 2 transects, at each dive-station, conditions permitting. Two transects worth of data would provide totals of 400 m^2 and 200 m^2 searched for large, relatively vagile and for small, site-attached reef fishes, respectively. The diver swam each transect at a constant speed (~ 15 minutes per transect) and identified each fish to species.

Random Swim:
After the deployment of the transect line and data had been collected during the timed fish size-class survey, the diver randomly swam the area of the transect line collecting data on all fish species present. Depth and air limited the duration of these random swims, but they generally lasted about 20 minutes at each survey site.

Estimation of Fish Biomass:
Biomass estimates were determined by using the length data estimates collected on the 25-m belt transect described above. Divers collected a fish's Total Length. This was transformed to Standard Length (SL) using data provided by Alan Friedlander that is based on unpublished data from the University of Hawaii Cooperative Fishery Research Unit. Once the SL was determined, the allometric length-weight conversion $W=aSL^b$ was used, where parameters *a* and *b* are constants, SL is Standard Length in millimeters, and W is the weight in grams. The *a* and *b*

constants for the above allometric equation for 150 species was also provided by Alan Friedlander. In cases where allometric length-weight conversions did not exist for a given species, the parameters from similar bodied congeners were used. The fish data collected at each transect was input into a spreadsheet by species and size class. The allometric equations converted the individual fish observations into fish weight estimates, then all individuals per transect were summed to determine the total fish weight per transect. Fish weight per transect was then converted to a standard biomass estimate of metric tons per hectare.

Algae Survey Protocol:

Quantitative (benthic percent cover):
A total of seven sites were surveyed in the vicinity of the Lahaina Harbor. Four 10-m surveys (two on each of the 25-m transect lines) were laid linearly on the reef or sand per survey station. Three quadrats were systematically placed on each 10-m survey. Quadrats were evenly spaced with five meters between each. The quadrat was 0.5 m^2 with 49 evenly spaced points, 20 of the 49 points were randomly selected to be identified. A total of 60 points were selected and identified per transect, and 240 points were compiled per station.

The organisms at each point were identified to the species level when possible. If a point could not be identified to the species or genus level, they were placed into functional groups. Turf algae consisted of all unidentifiable upright algal species of less than 1 cm. Other functional groups included crustose coralline algae, blue green algae, sponges, and sand.

Qualitative (algal species list):
This data set consisted of all macro-algae and distinguishable turf algae encountered on transects. In this case, the four 10-m linear surveys at each site were treated as a single two-meter wide belt transect. A species list was assembled for all seven sites at Lahaina. This data set should not be considered to be a comprehensive species list, no collections were taken or slides made to identify smaller difficult to identify species. Instead, this list should be considered to be a quick survey of the more prevalent algal species at each site. The actual number of species at these sites may be up to four times greater than what is presented in this report.

Coral Survey Protocol (modified after Maragos *et al.*, 2003, Ryan Okano, 2003):

Coral Transects:
The coral specialists surveyed all coral species found occurring within 0.5 m to either side of the transect line. The survey involved estimating the long diameter and species of each coral and recording the coral's assignment to one of the eight long-diameter size classes listed below:

0 – 1 cm	6 – 10 cm	21 – 40 cm	81 – 160 cm
2 – 5 cm	11 – 20 cm	41 – 80 cm	>160 cm

These size classes and protocols are adapted originally from Mundy (1996), who used them in American Samoa and by Maragos (2003) who used them in the Northwestern Hawaiian Islands. Corals showing signs of disease, predation, abnormal growth, bleaching or direct human impact were tallied, described, photographed, and if necessary, collected. Loose coral fragments were

also size classed as above using an "f" instead of a tally mark. Colonies showing partial mortality or observable fission were tallied into size classes based on total original colony size, but with a flag as to either partial mortality or fission (usually an "s" instead of a tally mark).

Invertebrate Survey Protocol:

The invertebrate specialist surveyed 3 meters on either side of the two 25-m transects for non-coral marine invertebrates. Additionally, data from ten 0.25m^2 quadrats for each survey site (five for each 25-m transect) were collected to determine the average percent cover of certain sessile target species or for sub-sampling large populations of mobile species (*e.g.*, boring sea urchins). Additionally, direct counts for trapezid guard crabs (per coral head) were taken by swimming back along the transect belt looking 1 m on either side of the line and recording the species of coral with the amount and species of crab inside.

Based on data from previous rapid ecological assessments, a group of target species was chosen for quadrat counts. The species in this list were chosen because they have been shown to be common components of the reef habitats of the Main Hawaiian Islands, and they are species that are generally visible (*i.e.*, non-cryptic) and easily enumerated during the course of a single 30-40 minute SCUBA survey.

These target species were:

ECHINODERMS
- Echinoids – sea urchins
- Holothuroids – sea cucumbers
- Asteroids – sea stars

MOLLUSCS
- Bivalves – spondylid oysters, pearl oysters
- Nudibranchs – sea slugs
- Gastropods – snails

CRUSTACEANS
- hermit crabs and lobsters

References

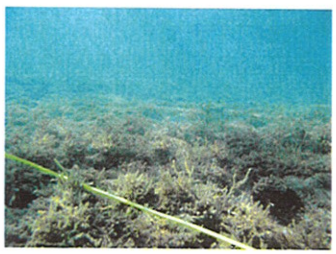
Maragos, J., Gulko, D. (eds.). 2002. Coral Reef Ecosystems of the Northwestern Hawaiian Islands: Interim Results Emphasizing the 2000 Surveys. U.S. Fish and Wildlife Service and the Hawaii Department of Land and Natural Resources, Honolulu, Hawaii. 46 pp.

APPENDIX B

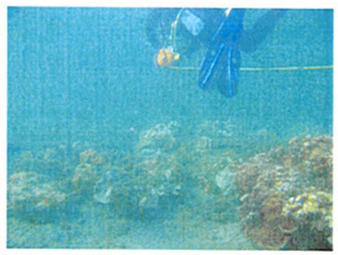
Photo Sequence for Lahaina Small Boat Harbor Survey Stations
December 11-14, 2005

Survey Station 1. Sand

Survey Station 1. Sand

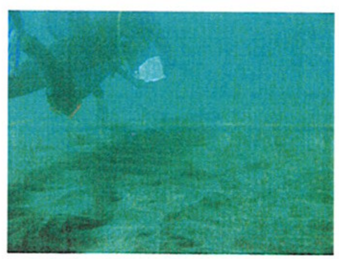


Survey Station 2. Reef flat

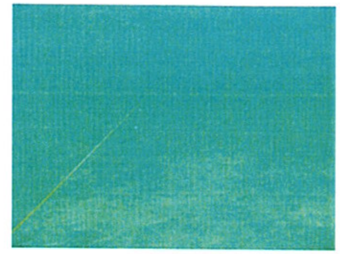


Survey Station 2. Reef flat

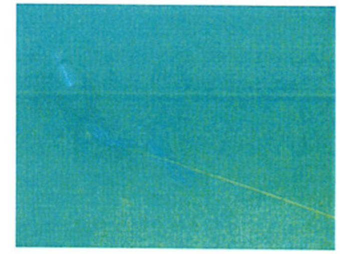
Survey Station 3. Sand



Survey Station 3. Sand



Survey Station 4. Sand



Survey Station 4. Sand

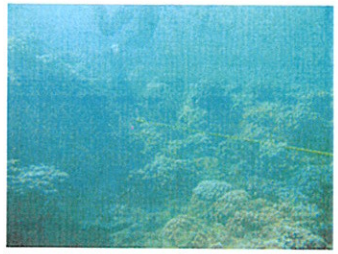
Survey Station. 5. Reef flat

Survey Station 5. Reef flat

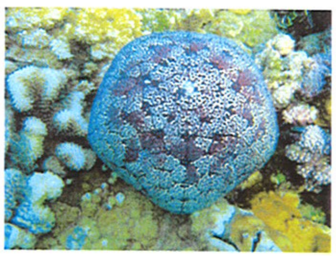
Survey Station 5. Reef flat

Survey Station 5. Reef flat

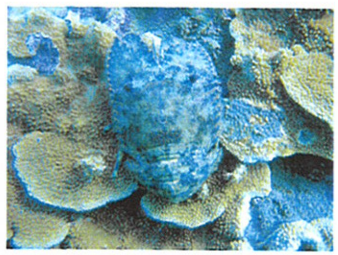
Survey Station 6. Reef flat



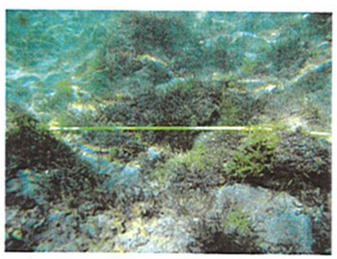
Survey Station 6. Reef flat



Survey Station 6. *Culcita novaeguineae*



Survey Station 6. *Parrabacus antarcticus*



Survey Station 7. Reef flat

Survey Station 7. Reef flat

APPENDIX C

Habitat Equivalency Analysis of Compensatory Mitigation For the Lahaina Small Boat Harbor Project, Maui, Hawaii

Prepared for the Pacific Islands Office,
U.S. Fish and Wildlife Service,
Honolulu, Hawaii

by

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DRAFT March 1, 2006

Introduction

This report documents the habitat equivalency analysis (HEA) of the Lahaina Small Boat Harbor project in Maui, Hawaii. HEA was used to scale, or to determine the appropriate quantity of, the compensatory mitigation measures that are recommended for the project. Compensatory mitigation is intended to replace the ecological services lost as a result of unavoidable impacts to resources affected by the project. Ecological services refer to the functions performed by a resource for the benefit of other resources or the public, such as the provision of food and refuge for fish populations. Given project impacts, the affected resources fail to provide the full complement of services that would have been provided absent the impacts until baseline is eventually achieved, if at all. During the interim between the onset of project impacts and the return to baseline, the ecological services associated with these affected resources will not be provided at the levels that would have existed had the impacts not occurred. Therefore, compensatory mitigation is recommended to provide comparable ecological services as a replacement for the services lost during that interim period.

It is important to scale compensatory mitigation to be commensurate with the type, level, and duration of lost services.[1] The amount of compensatory mitigation needed to replace lost services depends, in part, on the ability of the affected resources to return to their baseline conditions. Factors relevant in that regard include the quantity of affected resources and how fast and how completely they return to their baseline conditions. The amount of compensatory mitigation also depends on the ability of the selected compensatory mitigation measures to replace lost services. Relevant factors for replacement include how fast the compensatory mitigation measures become fully functional and the relative degree to which they provide additional ecological services. This report documents how these factors were considered in calculating the amount of compensatory mitigation for the project.

This report provides a brief description of the HEA methodology followed by an explanation of the analytic inputs and results. Two construction techniques were analyzed: piling pier construction and metal sheetpile pier construction. The inputs and results for these two techniques are presented separately. Details of the HEA are presented in an appendix.

Description of Habitat Equivalency Analysis

King and Adler (1991) first described habitat equivalency analysis as a methodology for scaling compensatory mitigation under Section 404 of the Clean Water Act. A more recent description of the methodology can be found in Allen, Chapman, and Lane (2005).

[1] A memorandum of agreement between the two Federal agencies that administer the Clean Water Act Section 404 program (US Department of the Army and US Environmental Protection Agency 1990) states that "The determination of what level of mitigation constitutes 'appropriate' mitigation is based solely on the values and functions of the aquatic resource that will be impacted." Further, where "practicable," the Army Corps of Engineers "will strive to achieve a goal of no overall net loss of values and functions."

Briefly, HEA scales compensatory mitigation so that the total quantity of ecological services it provides is sufficient to offset the total quantity of lost ecological services resulting from the project. When quantifying ecological services, it is important to note that they have a temporal dimension as well as a geographic dimension (e.g., a given area of coral habitat provides beneficial services over a period of time). Therefore, ecological services are quantified in HEA in units of measure such as "square foot-years." A square foot-year refers to all the resource services provided by one square foot of habitat for one year. For example, 1,000 square foot-years of services could be provided by a 50-square foot resource over a period of 20 years. This characterization captures not only the important aspect of the physical size of a resource, but also the fact that the period of time it continues to function is important as well.

This measure of ecological services is obviously specific to habitat since different habitats provide different services. Therefore, it is important to select compensatory mitigation measures that provide replacement services that are similar to the lost services (i.e., in-kind replacement). If that is not possible, some meaningful adjustment must be made to equate the replacement services to lost services.

Another important consideration is the value of time. In general, people prefer to enjoy things (money, consumption goods, environmental services, etc.) sooner rather than later. This "impatience" is important when comparing ecological services that are either lost or replaced at different times. Since the incidence of lost and replacement services generally extends over a span of time, these services must be adjusted so they can be aggregated and compared in a meaningful way. This adjustment process, known as discounting, permits one to examine values occurring at different times on a comparable basis. The adjustment involves decreasing future values, and increasing past values, each year by a proportional amount known as the discount rate. Discounting in this context is analogous to a bank's calculation of compound interest for a deposit or loan. The common time period to which all lost and replacement ecological services are discounted for sake of comparison is known as the present time period. For this analysis, the present time period is the year in which the HEA was conducted.

Through this process of quantifying and discounting ecological services, HEA takes into account losses and gains that occur over different timeframes to determine a scale of compensatory mitigation that is commensurate with the type, level, and duration of lost services. Because HEA accounts for all these important aspects, different compensatory mitigation projects will generally have different scales. For example, a compensatory mitigation project that becomes fully functional in 5 years will have a smaller indicated scale than one that becomes fully functional in 10 years. Therefore, it is important that the compensatory mitigation projects selected for analysis be chosen carefully. HEA is not used to select compensatory mitigation projects, only to determine their scale.

HEA has also been used in other contexts involving the loss of ecological services. For example, it is widely used in natural resource damage assessments conducted under the Oil Pollution Act of 1990 (33 U.S.C. 2701 *et seq.*) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 *et* *seq.*).[2] It has also been used to quantify consequences in ecological risk assessment (Linder et al. 2005).

Analytic Inputs - Piling Pier Construction

The following analytic inputs were used in the habitat equivalency analysis for the piling pier construction technique. These inputs are organized by the specific habitats affected by the project: sand, reef flat, and pilings. Detailed HEA calculations are presented in an appendix.

- Sand Habitat
  - Discounting inputs: Time in this HEA was denominated by quarter years due to the quick recovery times involved.
    - Quarterly discount rate: 0.75% (one-quarter of an annual 3% rate)
    - Present quarter: 1st quarter 2006
  - Lost services inputs
    - Losses due to net increase in pier pilings in 2008 (100-14=86 24-inch diameter pilings)
      - Affected habitat: 270.18 sq. feet
      - Lost services time path: 100% in 1st quarter 2008 and into perpetuity
    - Losses due to periodic dredging of remaining original sand habitat beginning in 2008 (10-year cycle)
      - Affected habitat: 21,100-270.18=20,829.82 sq. feet
      - Lost services time path
        - 100% in 1st through 4th quarters of each 10-year cycle
        - 0% in 7th quarter of each 10-year cycle
        - Lost services percentages for interim quarters determined by linear interpolation
    - Gains due to conversion of reef flat habitat to new sand habitat in 2009
      - Affected habitat: 2,720 sq. feet
      - Gained services time path
        - 0% in 4th quarter 2008
        - 100% in 3rd quarter 2009
        - Gained services percentages for interim quarters determined by linear interpolation
    - Losses due to periodic dredging of new sand habitat beginning in 2018 (10-year cycle)
      - Affected habitat: 2,720 sq. feet
      - Lost services time path

[2] For example, see Unsworth and Petersen (1995) and National Park Service (2003).

        - 100% in 1st through 4th quarters of each 10-year cycle
        - 0% in 7th quarter of each 10-year cycle
        - Lost services percentages for interim quarters determined by linear interpolation

- Reef Flat Habitat
  - Discounting inputs: Time in this HEA was denominated by years.
    - Annual discount rate: 3%
    - Present year: 2006
  - Lost services inputs
    - Losses due to primary impacts (dredging)
      - Affected habitat: 2,720 sq. feet
      - Lost services time path: 100% in 2008 and into perpetuity
    - Losses due to secondary impacts (sedimentation)
      - Affected habitat: 950 sq. feet
      - Lost services time path
        - 20% in 2008
        - 0% in 2023
        - Lost services percentages for interim years determined by linear interpolation
    - Gains due to transplantation (Dolphin grounding site)
      - Affected habitat: 4,100 sq. feet
      - Gained services time path
        - 46% in 2008 (70% survival of transplanted coral from 2,720-sq foot dredged reef flat)
        - 100% in 2043
        - Gained services percentages for interim years determined by linear interpolation

- Pilings Habitat
  - Discounting inputs: Time in this HEA was denominated by years.
    - Annual discount rate: 3%
    - Present year: 2006
  - Lost services inputs
    - Losses due to removal of existing pilings (14 24-inch diameter pilings)
      - Affected habitat: 527.79 sq. feet
      - Lost services time path: 100% in 2008 and into perpetuity
    - Gains due to installation of new pilings (100 24-inch diameter pilings)
      - Affected habitat: 3,769.91 sq. feet
      - Gained services time path
        - 0% in 2009
        - 100% in 2039

- Gained services percentages for interim years determined by linear interpolation

Results - Piling Pier Construction

The following results were determined by the habitat equivalency analysis for the piling pier construction technique. These results are organized by the specific habitats affected by the project: sand, reef flat, and pilings. Detailed HEA calculations are presented in an appendix.

- Pilings Habitat
  - Total present value of lost services
    - Losses due to net increase in pier pilings in 2008: 34,188.22 sq. foot quarters
    - Losses due to periodic dredging of remaining original sand habitat beginning in 2008: 396,977.04 sq. foot quarters
    - Gains due to conversion of reef flat habitat to new sand habitat in 2009: 331,569.87 sq. foot quarters
    - Losses due to periodic dredging of new sand habitat beginning in 2018: 36,214.80 sq. foot quarters
    - *Net lost services: 135,810.20 sq. foot quarters*
- Reef Flat Habitat
  - Total present value of lost services
    - Losses due to primary impacts (dredging): 88,025.89 sq. foot years
    - Losses due to secondary impacts (sedimentation): 1,255.22 sq. foot years
    - Gains due to transplantation (Dolphin grounding site): 105,023.31 sq. foot years
    - *Net lost services: -15,742.20 sq. foot years (a net gain)*
- Pilings Habitat
  - Total present value of lost services
    - Losses due to removal of existing pilings (14 24-inch diameter pilings): 17,080.50 sq. foot years
    - Gains due to installation of new pilings (100 24-inch diameter pilings): 77,389.14 sq. foot years
    - *Net lost services: -60,308.63 sq. foot years (a net gain)*

References

Allen, P. D., II, D. J. Chapman, and D. Lane. "Scaling Environmental Mitigation to Offset Injury Using Habitat Equivalency Analysis." In Economics and Ecological

Risk Assessment, edited by R. J. F. Bruins and M. T. Heberling. Boca Raton, FL: CRC Press, 2005.

King, D. M., and K. J. Adler. "Scientifically Defensible Compensation Ratios for Wetland Mitigation." Washington, DC: U.S. Environmental Protection Agency, January 1991.

Linder, G., E. Little, L. Johnson, C. Vishy, B. Peacock, and H. Goeddeke. "Risk and Consequence Analysis Focused on Biota Transfers Potentially Associated with Surface Water Diversions Between the Missouri River and Red River Basins." Columbia, MO: U.S. Geological Survey, July 2005.

National Park Service. "Damage Assessment and Restoration Handbook - Guidance for Damage Assessment and Restoration Activities in the National Park Service." Washington, DC: National Park Service, December 2003.

Unsworth, R. E., and T. B. Petersen. "A Manual for Conducting Natural Resource Damage Assessment: The Role of Economics." Manual prepared for the U.S. Fish and Wildlife Service by Industrial Economics, Inc. 1995.

U.S. Department of the Army and U.S. Environmental Protection Agency. "Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines." February 6, 1990.

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Habitat Equivalency Analysis
Lahaina Small Boat Harbor - Piling Pier Construction
Sand Habitat

Quarterly discount rate: 0.75%

Present actual quarter (a): 1

Quantification of Lost Services

Losses due to net increase in pier pilings in 2008 (100-14=86 24-inch diameter pilings)

Affected habitat (sq ft): 270.18

		<------(Sq Ft Quarters)------>	
Actual Quarter (a)	(Percent)	Current Value	Present Value (b)
9	100.0%	270.18	254.50
Beyond			33,933.72
Total			34,188.22

Losses due to periodic dredging of remaining original sand habitat beginning in 2008 (21,100-270.18=20,829.82 sq ft)

Affected habitat (sq ft): 20,829.82

		<------(Sq Ft Quarters)------>	
Recurring Quarter (c)	(Percent)	Current Value	Present Value (d)
1	100.0%	20,829.82	20,674.76
2	100.0%	20,829.82	20,520.85
3	100.0%	20,829.82	20,368.09
4	100.0%	20,829.82	20,216.47
5	66.7%	13,886.55	13,377.32
6	33.3%	6,943.27	6,638.87
7	0.0%	0.00	0.00
Total			101,796.36

Amortized present value over 10-year dredging cycle (sq ft quarters): 2,955.16

Present value into perpetuity (sq ft quarters): 396,977.04

Gains due to conversion of reef flat habitat to new sand habitat in 2009

Affected habitat (sq ft): 2,720.00

		(Sq Ft Quarters)	
Actual Quarter (a)	**(Percent)**	**Current Value**	**Present Value (b)**
12	0.0%	0.00	0.00
13	33.3%	906.67	828.91
14	66.7%	1,813.33	1,645.48
15	100.0%	2,720.00	2,449.84
Beyond			326,645.65
Total			331,569.87

Losses due to periodic dredging of new sand habitat beginning in 2018

Affected habitat (sq ft): 2,720.00

		(Sq Ft Quarters)	
Recurring Quarter (c)	**(Percent)**	**Current Value**	**Present Value (d)**
1	100.0%	2,720.00	2,699.75
2	100.0%	2,720.00	2,679.65
3	100.0%	2,720.00	2,659.71
4	100.0%	2,720.00	2,639.91
5	66.7%	1,813.33	1,746.84
6	33.3%	906.67	866.92
7	0.0%	0.00	0.00
Total			13,292.77

Amortized present value over 10-year dredging cycle (sq ft quarters): 385.89

Present value into perpetuity (sq ft quarters): 36,214.80

Net lost services (sq ft quarters): 135,810.20

Notes

(a) Actual quarters are numbered in a series beginning with 1 corresponding to the first quarter of 2006.

(b) Current values are discounted to the present actual quarter (1).

(c) Recurring quarters are numbered in a series beginning with 1 corresponding to the first quarter of each 10-year dredging cycle.

(d) Current values are discounted to recurring quarter 0.

"Beyond" indicates the remaining time horizon into perpetuity.

Habitat Equivalency Analysis
Lahaina Small Boat Harbor - Piling Pier Construction
Reef Flat Habitat

Annual discount rate: 3.0%

Present year: 2006

Quantification of Lost Services

Losses due to primary impacts (dredging)

Affected habitat (sq ft): 2,720.00

		(Sq Ft Years)	
Year	**(Percent)**	**Current Value**	**Present Value**
2008	100.0%	2,720.00	2,563.86
Beyond			85,462.03
Total			88,025.89

Losses due to secondary impacts (sedimentation)

Affected habitat (sq ft): 950.00

		(Sq Ft Years)	
Year	**(Percent)**	**Current Value**	**Present Value**
2008	20.0%	190.00	179.09
2009	18.7%	177.33	162.29
2010	17.3%	164.67	146.30
2011	16.0%	152.00	131.12
2012	14.7%	139.33	116.69
2013	13.3%	126.67	102.99
2014	12.0%	114.00	89.99
2015	10.7%	101.33	77.66
2016	9.3%	88.67	65.98
2017	8.0%	76.00	54.90
2018	6.7%	63.33	44.42
2019	5.3%	50.67	34.50
2020	4.0%	38.00	25.12
2021	2.7%	25.33	16.26
2022	1.3%	12.67	7.89
2023	0.0%	0.00	0.00
Total			1,255.22

Gains due to transplantation (Dolphin grounding site)

Affected habitat (sq ft): 4,100.00

Year	(Percent)	<——(Sq Ft Years) Current Value	——> Present Value
2008	46.0%	1,886.00	1,777.74
2009	47.5%	1,949.26	1,783.85
2010	49.1%	2,012.51	1,788.09
2011	50.6%	2,075.77	1,790.58
2012	52.2%	2,139.03	1,791.40
2013	53.7%	2,202.29	1,790.66
2014	55.3%	2,265.54	1,788.44
2015	56.8%	2,328.80	1,784.83
2016	58.3%	2,392.06	1,779.92
2017	59.9%	2,455.31	1,773.77
2018	61.4%	2,518.57	1,766.48
2019	63.0%	2,581.83	1,758.10
2020	64.5%	2,645.09	1,748.71
2021	66.1%	2,708.34	1,738.38
2022	67.6%	2,771.60	1,727.17
2023	69.1%	2,834.86	1,715.14
2024	70.7%	2,898.11	1,702.34
2025	72.2%	2,961.37	1,688.83
2026	73.8%	3,024.63	1,674.66
2027	75.3%	3,087.89	1,659.89
2028	76.9%	3,151.14	1,644.56
2029	78.4%	3,214.40	1,628.71
2030	79.9%	3,277.66	1,612.39
2031	81.5%	3,340.91	1,595.64
2032	83.0%	3,404.17	1,578.50
2033	84.6%	3,467.43	1,561.00
2034	86.1%	3,530.69	1,543.18
2035	87.7%	3,593.94	1,525.08
2036	89.2%	3,657.20	1,506.72
2037	90.7%	3,720.46	1,488.14
2038	92.3%	3,783.71	1,469.36
2039	93.8%	3,846.97	1,450.41
2040	95.4%	3,910.23	1,431.32
2041	96.9%	3,973.49	1,412.11
2042	98.5%	4,036.74	1,392.81
2043	100.0%	4,100.00	1,373.43
Beyond			45,781.00
Total			105,023.31

Net lost services (sq ft years): -15,742.20

Notes

"Beyond" indicates the remaining time horizon into perpetuity.

Habitat Equivalency Analysis

Lahaina Small Boat Harbor - Piling Pier Construction
Pilings Habitat

Annual discount rate: 3.0%

Present year: 2006

Quantification of Lost Services

Losses due to removal of existing pilings (14 24-inch diameter pilings)

Affected habitat (sq ft): 527.79

Year	(Percent)	<——(Sq Ft Years) Current Value	——> Present Value
2008	100.0%	527.79	497.49
Beyond			16,583.01
Total			17,080.50

Gains due to installation of new pilings (100 24-inch diameter pilings)

New piling habitat (sq ft): 3,769.91

Year	(Percent)	<——(Sq Ft Years) Current Value	——> Present Value
2009	0.0%	0.00	0.00
2010	3.3%	125.66	111.65
2011	6.7%	251.33	216.80
2012	10.0%	376.99	315.72
2013	13.3%	502.65	408.70
2014	16.7%	628.32	496.00
2015	20.0%	753.98	577.86
2016	23.3%	879.65	654.54
2017	26.7%	1,005.31	726.26
2018	30.0%	1,130.97	793.24
2019	33.3%	1,256.64	855.71
2020	36.7%	1,382.30	913.86
2021	40.0%	1,507.96	967.91
2022	43.3%	1,633.63	1,018.02
2023	46.7%	1,759.29	1,064.40
2024	50.0%	1,884.96	1,107.21
2025	53.3%	2,010.62	1,146.63
2026	56.7%	2,136.28	1,182.81
2027	60.0%	2,261.95	1,215.91
2028	63.3%	2,387.61	1,246.08
2029	66.7%	2,513.27	1,273.46
2030	70.0%	2,638.94	1,298.18
2031	73.3%	2,764.60	1,320.39

2032	76.7%	2,890.27	1,340.20
2033	80.0%	3,015.93	1,357.74
2034	83.3%	3,141.59	1,373.12
2035	86.7%	3,267.26	1,386.45
2036	90.0%	3,392.92	1,397.84
2037	93.3%	3,518.58	1,407.39
2038	96.7%	3,644.25	1,415.20
2039	100.0%	3,769.91	1,421.36
Beyond			47,378.52
Total			77,389.14

Net loss services (sq ft): -60,308.63

Notes

"Beyond" indicates the remaining time horizon into perpetuity.

APPENDIX F.

Traffic Impact Report, June 2006

Traffic Impact Report

Lahaina Small Boat Harbor

Submitted to:
Mitsunaga & Associates, Inc.

Submitted by:
Wilson Okamoto Corporation

June 2006

TRAFFIC ASSESSMENT REPORT

FOR THE

LAHAINA SMALL BOAT HARBOR

Prepared for:

Mitsunaga & Associates, Inc.
747 Amana Street, Suite 216
Honolulu, Hawaii 96814

Prepared by:

Wilson Okamoto Corporation
1907 South Beretania Street
Honolulu, Hawaii 96826
WOC Ref: #7545-01

June 2006

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to assess anticipated traffic conditions resulting from the implementation of improvements at the existing Lahaina Small Boat Harbor located in Lahaina on the island of Maui. These improvements include the construction of a new ferry pier with a pedestrian walkway connection to the existing pier, sidewalk, parking, and roadway modifications, and the replacement of an existing comfort station, Harbor Master's Office, and ancillary structures.

B. Scope of Study

This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing traffic operations in the vicinity.
3. Analysis of projected traffic operations in the vicinity with the proposed project.
4. Recommendation of improvements, if appropriate, that would alleviate anticipated traffic operating conditions with the proposed project.

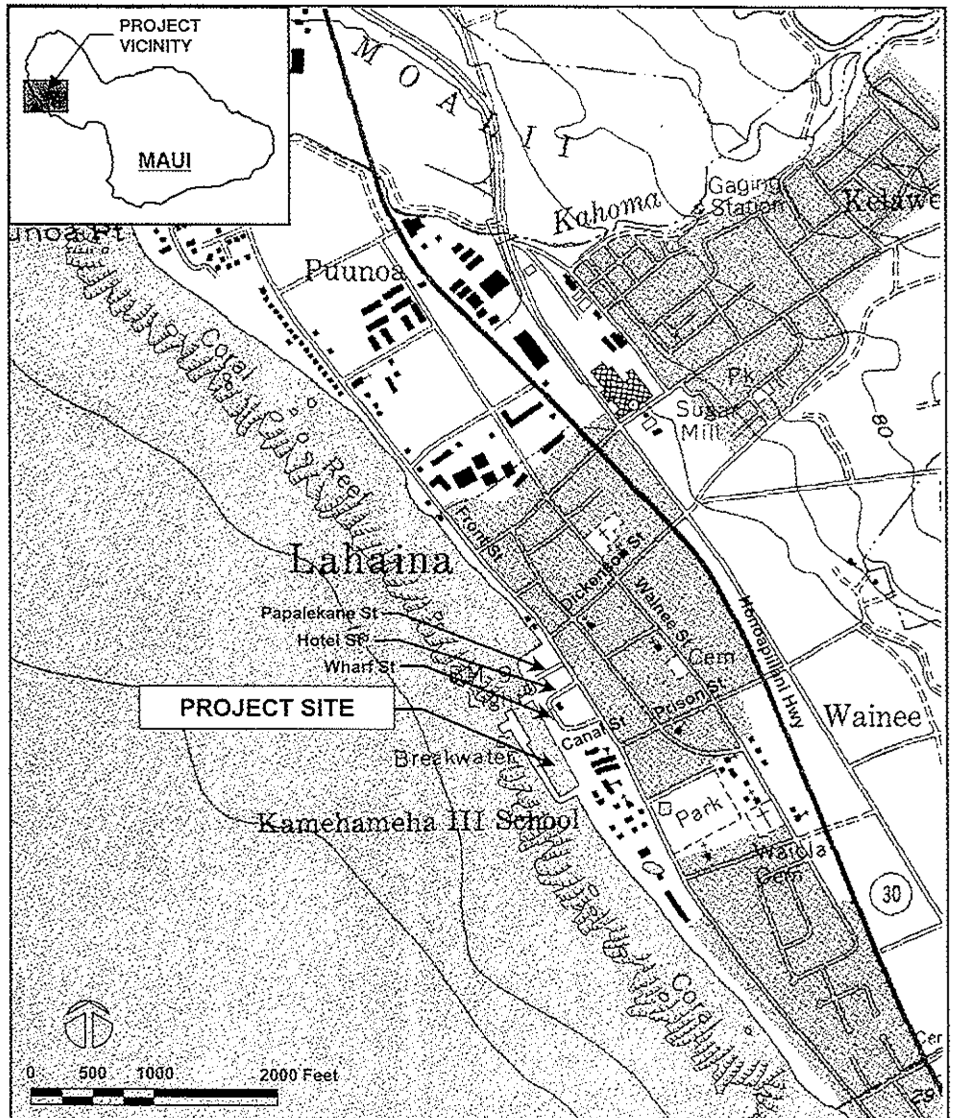
II. PROJECT DESCRIPTION

A. Location

The existing Lahaina Small Boat Harbor is located west of Front Street between Dickenson Street and Prison Street in Lahaina on the island of Maui (see Figure 1). Access to the existing harbor from Front Street is currently provided via Hotel Street, Wharf Street, Canal Street, and Papalekane Street.

B. Project Characteristics

The Lahaina Small Boat Harbor currently includes approximately 98 berths for recreational and commercial craft and a pier which houses the Harbor Master's Office, ferry kiosk, and diesel fuel dispensing and sewage pumping facilities. The existing pier is used to load/unload passengers from recreational and commercial vessels including cruise ship tenders and interisland ferries. When there are large cruise ships in port, the area immediately adjacent to this existing pier, including



WILSON OKAMOTO CORPORATION
ENGINEERS - PLANNERS

LAHAINA SMALL BOAT HARBOR

Location Map and Vicinity Map

FIGURE 1

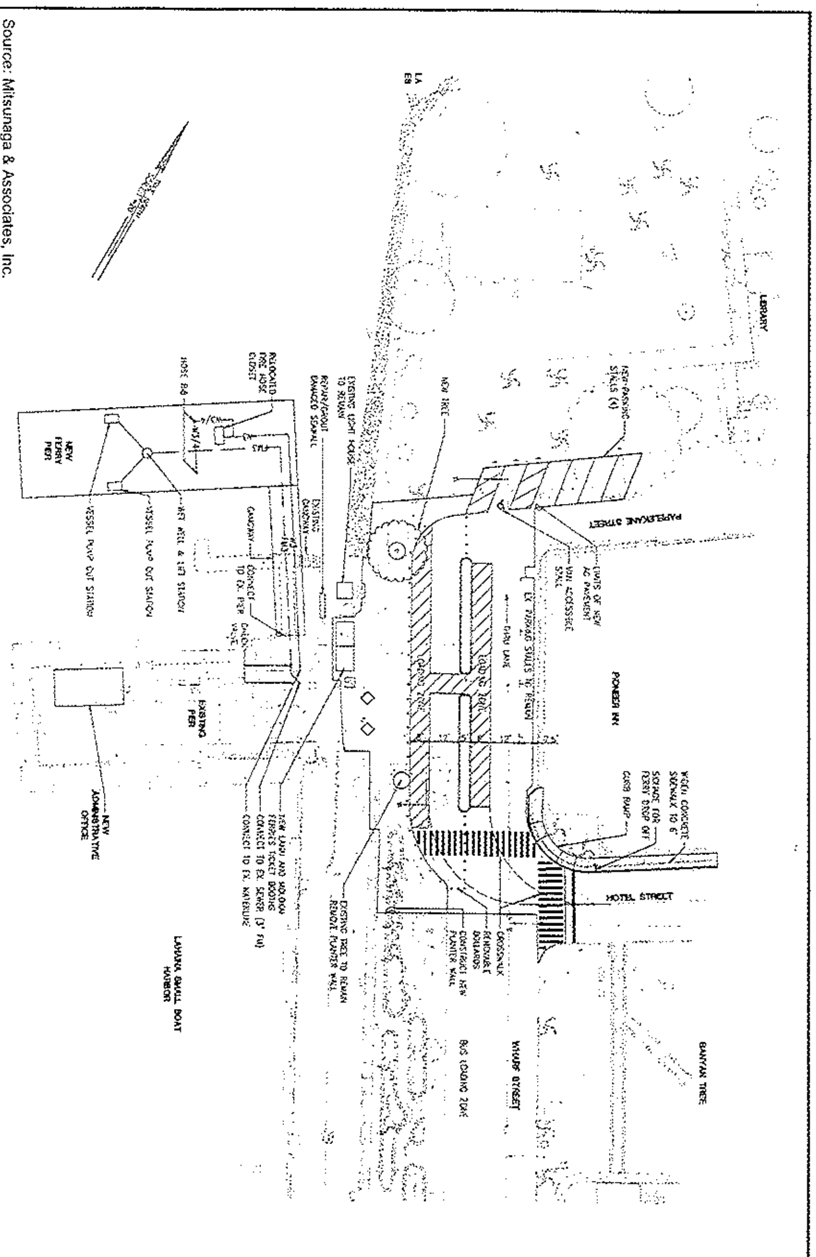
portions of the adjacent roadway, is blocked by removable bollards and cones to create a security buffer area that is controlled by harbor personnel. As such, portions of the adjacent Wharf Street are inaccessible to privately owned vehicles. Only authorized vehicles driven by harbor personnel, library users, or guests of the adjacent Pioneer Inn are allowed to access this area.

The proposed project entails the construction of a new ferry pier north of the existing pier with a new pedestrian walkway connection to the existing pier, sidewalk, parking, and roadway modifications, and the replacement of an existing comfort station, Harbor Master's Office, and ancillary structures to conform to the Americans with Disabilities (ADA) and/or Lahaina Historic District requirements. The new ferry pier is intended to serve as the primary docking facility for the interisland ferries currently accessing the harbor and is expected to improve operating conditions in the harbor by alleviating existing vessel traffic congestion at the existing pier. Similarly, the proposed sidewalk, parking, and roadway modifications are intended to improve traffic operating conditions near the harbor by reducing the existing vehicular and pedestrian congestion in the immediate vicinity of the existing pier. As such, the proposed improvements are not anticipated to generate any additional trips to or from the harbor. However, the proposed roadway modifications would allow vehicular traffic to access the entire length of Wharf Street and Papalekane Street at all times. As such, vehicles exiting the harbor area may modify their route resulting in the redistribution of traffic in the project vicinity. The proposed improvements are expected to be completed by the Year 2010. Access to harbor will continue to be provided via Hotel Street, Wharf Street, Canal Street, and Papalekane Street. Figure 2 shows the proposed site plan.

III. EXISTING CONDITIONS

A. General

The existing Lahaina Small Boat Harbor is located west of Front Street, a predominantly two-lane, two-way roadway that provides access between Honoapiilani Highway and the commercial areas, residences, and other areas of accommodations along its alignment. In the vicinity of the project site, Honoapiilani Highway is a



Source: Mitsunaga & Associates, Inc.

WILSON OKAMOTO CORPORATION
ENGINEERS - PLANNERS

LAHAINA SMALL BOAT HARBOR

PROJECT SITE PLAN

FIGURE 2

predominantly two-lane, two-way State of Hawaii roadway that serves as the main access road along the coastline of West Maui. Traffic volumes along the highway have increased steadily in recent years due to residential and commercial development in areas north of Lahaina.

B. Area Roadway System

Vehicular traffic access to the Lahaina Small Boat Harbor is currently provided via Front Street. Near the north end of the project site, Front Street intersects Hotel Street, a one-lane, one-way (westbound) roadway that serves as the primary entrance for the harbor. At this unsignalized T-intersection, both approaches of Front Street have one lane that serve through and turning traffic movements.

North of the intersection with Hotel Street, Front Street intersects Papalekane Street, a one-lane, one-way (eastbound) roadway that serves as a secondary exit for the harbor. At this unsignalized T-intersection, both approaches of Front Street have one lane that serve through traffic only while the Papalekane Street approach has one lane that serves left-turn and right-turn traffic movements.

South of the intersection with Hotel Street, Front Street intersects Canal Street. At this unsignalized T-intersection, both approaches of Front Street have one lane that serve through traffic only. Canal Street is a predominantly one-lane, one-way (eastbound) roadway that serves as the primary exit for the harbor. At the intersection with Front Street, the Canal Street approach has two exclusive turning lanes.

Further south, Front Street intersects Prison Street. At this unsignalized T-intersection, both approaches of Front Street have one lane that serve through and turning traffic movements. Prison Street is a two-lane, two-way County of Maui roadway generally oriented in the east-west direction that primarily serves as a connector roadway between Front Street and Honoapiilani Highway. At the intersection with Front Street, the Prison Street approach has one lane that serves left-turn and right-turn traffic movements.

East of the intersection with Front Street, Prison Street intersects Wainee Street. At this unsignalized intersection, both approaches of Prison Street have one

lane that serve left-turn, through, and right-turn traffic movements. Wainee Street is a two-lane, two-way County of Maui roadway generally oriented in the north-south direction that provides access to the residential and commercial properties along its alignment. At the intersection with Prison Street, both approaches of Wainee Street have one lane that serve all traffic movements.

Further east, Prison Street intersects Honoapiilani Highway. At this unsignalized intersection, the eastbound approach of Prison Street has one lane that serves through and right-turn traffic movements while the westbound approach has one lane that serves all traffic movements. The northbound approach of Honoapiilani Highway has an exclusive left-turn lane and a shared through and right-turn lane at this intersection while the southbound approach has one lane that serves through and right-turn traffic movements.

North of the intersection with Papalekane Street, Front Street intersects Dickenson Street. At this unsignalized T-intersection, both approaches of Front Street have one lane that serves through and turning traffic movements. Dickenson Street is a two-lane, two-way County of Maui roadway generally oriented in the east-west direction that primarily serves as a connector roadway between Front Street and Honoapiilani Highway. At the intersection with Front Street, the Dickenson Street approach has one lane that serves left-turn and right-turn traffic movements.

East of the intersection with Front Street, Dickenson Street intersects Wainee Street. At this unsignalized intersection, the eastbound and westbound approaches of Dickenson Street have one lane that serves all traffic movements. The northbound and southbound approaches of Wainee Street also have one lane at this intersection that serves all traffic movements.

Further east, Dickenson Street intersects Honoapiilani Highway. At this signalized intersection, both approaches of Dickenson Street have one lane that serves all traffic movements. The northbound approach of Honoapiilani Highway has an exclusive left-turn lane and a shared through and right-turn lane at this intersection while the southbound approach has an exclusive left-turn lane, one through lane, and a shared through and right-turn lane.

C. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on March 8-9 and 29-31, 2006 and April 18-19 and 25-26, 2006, and consisted of field observations of traffic conditions in the vicinity and manual turning movement count surveys in the project vicinity. These investigations encompassed periods when there were cruise ships in port with more than 2,000 passengers (hereinafter referred to as a "Boat Day") and when there were only smaller ships in port (hereinafter referred to as a "Non Boat Day"). On a "Boat Day," the manual turning movement count surveys were conducted between the morning peak hours of 8:30 AM and 10:30 AM, and between the afternoon peak hours of 3:30 PM and 5:30 PM at the following intersections:

- Front Street and Hotel Street
- Front Street and Prison Street
- Prison Street and Wainee Street
- Prison Street and Honoapiilani Highway
- Front Street and Dickenson Street
- Dickenson Street and Wainee Street
- Dickenson Street and Honoapiilani Highway

On a "Non Boat Day," the manual turning movement count surveys were conducted between the morning peak hours of 7:00 AM and 9:00 AM, and the between the afternoon peak hours of 3:30 PM and 5:30 PM. In addition, any available 24-hour traffic counts along Honoapiilani Highway were reviewed and additional 24-hour traffic counts surveys were collected along Hotel Street, Canal Street, Prison Street, and Dickenson Street.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Highway Capacity Software", developed by the Federal Highway Administration. The analysis is based on the concept of Level of Service (LOS).

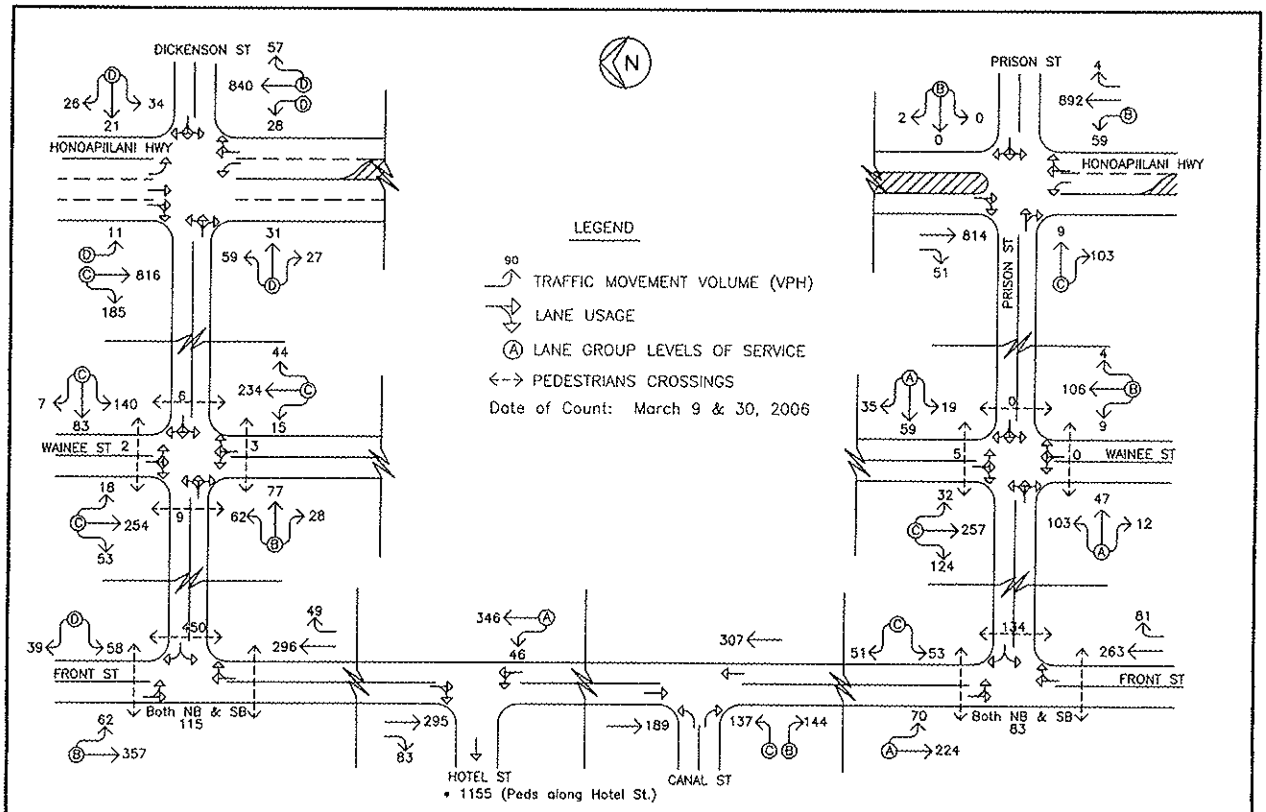
LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F". LOS "A" represents ideal or free-flow traffic operating conditions and LOS "F" represents unacceptable or potentially congested traffic operating conditions. LOS "B", "C", "D", and "E" represent the intermediate traffic operational characteristics between the two extremes of LOS "A" and LOS "F". The LOS definitions are included in Appendix B.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the roadway carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 generally indicates that the traffic demand exceeds the road's carrying capacity.

2. Existing Peak Hour Traffic

a. General

Figures 3 to 6 show the existing AM and PM peak hour traffic volumes and traffic operating conditions in the project vicinity on a "Boat Day" and "Non Boat Day." In the vicinity of the proposed project, the AM peak hour of traffic generally occurs between 9:30 AM and 10:30 AM on a "Boat Day" and between 7:00 AM and 8:00 AM on a "Non Boat Day." In the afternoon, the PM peak hour of traffic generally occurs between the hours of 3:30 PM and 4:30 PM for both a "Boat Day" and "Non Boat Day." The analysis is based on these peak hour time periods to identify the traffic impacts resulting



LAHAINA SMALL BOAT HARBOR

EXISTING PM PEAK HOURS OF TRAFFIC - BOAT DAY

FIGURE 4

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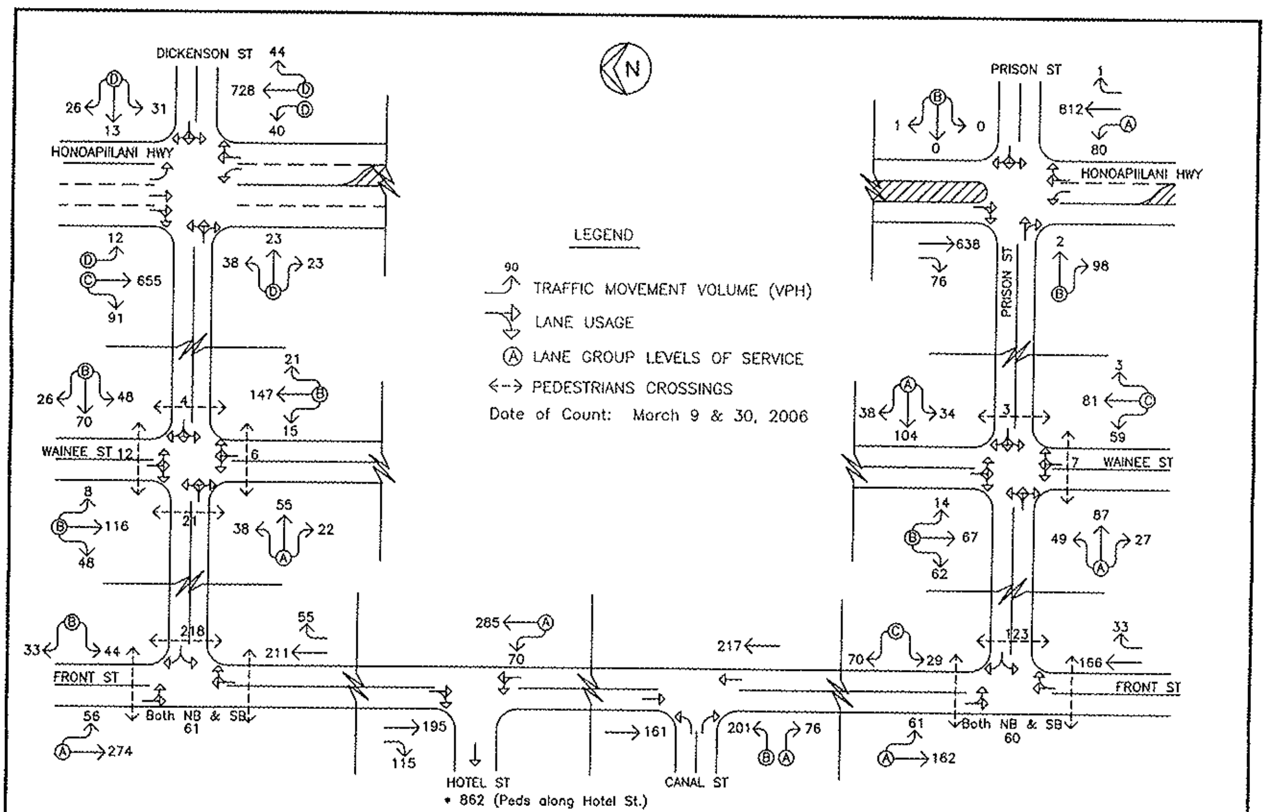

LAHAINA SMALL BOAT HARBOR

EXISTING AM PEAK HOURS OF TRAFFIC - BOAT DAY

FIGURE 3

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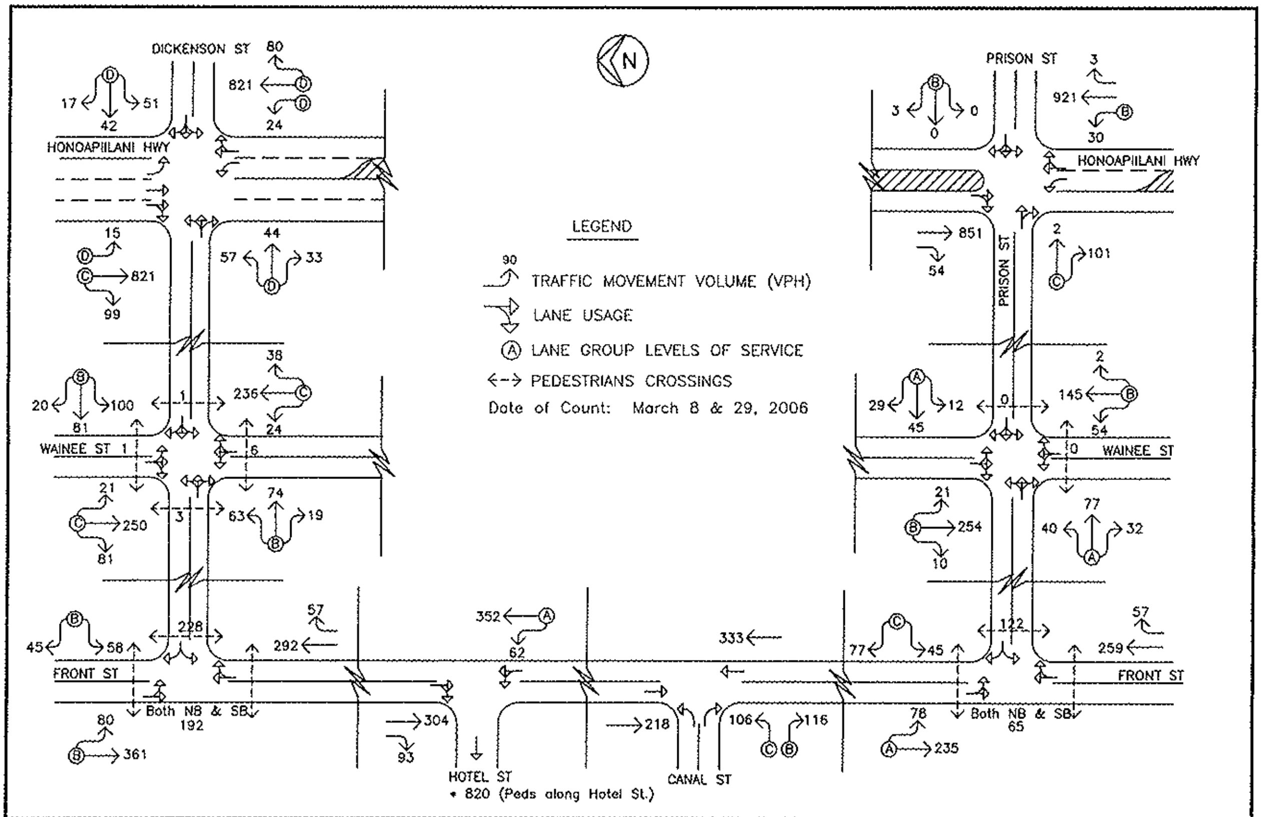

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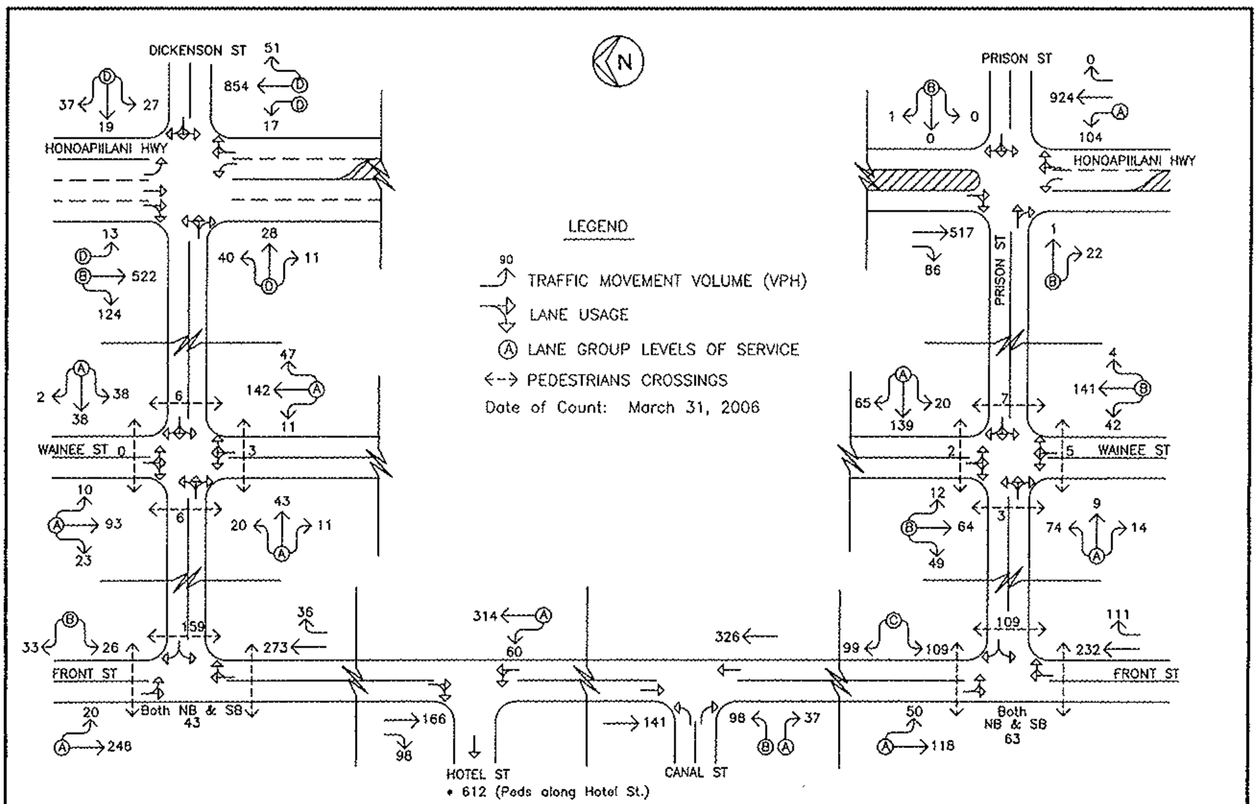
LAHAINA SMALL BOAT HARBOR

EXISTING PM PEAK HOURS OF TRAFFIC - NON BOAT DAY

FIGURE 6



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LAHAINA SMALL BOAT HARBOR

EXISTING AM PEAK HOURS OF TRAFFIC - NON BOAT DAY

FIGURE 5

from the proposed project. The LOS calculation worksheets are included in Appendix C.

b. Front Street and Hotel Street

At the intersection with Hotel Street, Front Street carries 355 vehicles northbound and 310 vehicles southbound during the AM peak period on a "Boat Day," and 374 vehicles northbound and 264 vehicles southbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 392 vehicles traveling northbound and 378 vehicles traveling southbound on a "Boat Day" and 414 vehicles traveling northbound and 397 southbound on a "Non Boat Day." A significant portion of this traffic is comprised of taxis, limos, buses, and shuttles. On a "Boat Day," the volume of buses and shuttles was three to five times higher than on a "Non Boat Day." The critical movement at the intersection is the northbound left-turn and through traffic movement which operates at LOS "A" during all peak periods.

Pedestrian traffic at the intersection and along Hotel Street is fairly high. Approximately 862 pedestrians and 612 pedestrian were observed traveling along that roadway during the AM peak period of a "Boat Day" and "Non Boat Day," respectively, and 1,155 pedestrians and 820 pedestrians observed along that roadway during the PM peak period of a "Boat Day" and "Non Boat Day," respectively. These pedestrians conflict with turning vehicular traffic at the intersection and often impede the movement of vehicles along Hotel Street.

c. Front Street and Canal Street

At the intersection with Canal Street, Front Street carries 217 vehicles northbound and 161 vehicles southbound during the AM peak period on a "Boat Day," and 326 vehicles northbound and 141 vehicles southbound on a "Non Boat Day." During the PM peak period, traffic volumes are slightly higher with 307 vehicles traveling northbound and

189 vehicles traveling southbound on a "Boat Day" and 333 vehicles traveling northbound and 218 southbound on a "Non Boat Day."

The Canal Street approach of the intersection carries 277 vehicles and 135 vehicles eastbound during the AM peak period on a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, traffic volumes are slightly higher with 281 vehicles and 222 vehicles traveling eastbound. The left-turn traffic movement on this approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day" while the right-turn traffic movement operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day."

d. Front Street and Prison Street

At the intersection with Prison Street, Front Street carries 199 vehicles northbound and 223 vehicles southbound during the AM peak period on a "Boat Day," and 343 vehicles northbound and 168 vehicles southbound on a "Non Boat Day." During the PM peak period, the overall traffic volume is higher with 344 vehicles traveling northbound and 294 vehicles traveling southbound on a "Boat Day" and 316 vehicles traveling northbound and 313 southbound on a "Non Boat Day." The critical movement on the Front Street approaches is the southbound left-turn and through traffic movement which operates at LOS "A" during all peak periods. Pedestrian volumes crossing Front Street are significantly lower than along Hotel Street with 60 pedestrians and 63 pedestrians observed crossing the street during the AM peak period of a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, pedestrian volumes are approximately the same with 83 pedestrians and 65 pedestrians observed crossing the street on a "Boat Day" and "Non Boat Day," respectively.

The Prison Street approach of the intersection carries 99 vehicles and 208 vehicles westbound during the AM peak period on a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, this approach carries 104 vehicles and 122 vehicles westbound. Vehicular queues periodically formed on this approach with average queue lengths of 3-5 vehicles observed during all peak periods. The Prison Street approach operates at LOS "C" during all peak periods. Pedestrian volumes crossing Prison Street are slightly higher than those crossing Front Street with 123 pedestrians and 109 pedestrians observed crossing the street during the AM peak period of a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, 134 pedestrians and 122 pedestrians were observed crossing the street on a "Boat Day" and "Non Boat Day," respectively.

e. Prison Street and Wainee Street

At the intersection with Wainee Street, Prison Street carries 163 vehicles eastbound and 176 vehicles westbound during the AM peak period on a "Boat Day," and 97 vehicles eastbound and 224 vehicles westbound on a "Non Boat Day." During the PM peak period, the overall traffic volume is slightly less with 162 vehicles traveling eastbound and 113 vehicles traveling westbound on a "Boat Day" and 149 vehicles traveling eastbound and 86 traveling westbound on a "Non Boat Day." Both approaches of Prison Street operate at LOS "A" during all peak periods.

The Wainee Street approaches of the intersection carry 143 vehicles northbound and 143 vehicles southbound during the AM peak period on a "Boat Day," and 187 vehicles northbound and 125 vehicles southbound on a "Non Boat Day." During the PM peak period, the overall traffic volume is higher with 119 vehicles traveling northbound and 413 vehicles traveling southbound on a "Boat Day" and 201 vehicles traveling northbound and 285 traveling southbound on a "Non

Boat Day." Vehicular queues periodically formed on both approaches with average queue lengths of 3-5 vehicles observed during all peak periods. The northbound approach of Wainee Street operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively, of a "Boat Day" while the southbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively. On a "Non Boat Day," both approaches of Wainee Street operate at LOS "B" during both peak periods.

f. Prison Street and Honoapiilani Highway

At the intersection with Honoapiilani Highway, Prison Street carries 100 vehicles eastbound and 1 vehicle westbound during the AM peak period on a "Boat Day," and 23 vehicles eastbound and 1 vehicle westbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 112 vehicles traveling eastbound and 2 vehicle traveling westbound on a "Boat Day" and 103 vehicles traveling eastbound and 3 vehicles traveling westbound on a "Non Boat Day." Vehicular queues periodically formed on the eastbound approach of Prison Street with average queue lengths of 3-5 vehicles observed during all peak periods. The eastbound approach of Prison Street operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day" while the westbound approach operates at LOS "B" during all peak periods.

The Honoapiilani Highway approaches of the intersection carry 893 vehicles northbound and 714 vehicles southbound during the AM peak period on a "Boat Day," and 1,028 vehicles northbound and 603 vehicles southbound on a "Non Boat Day." During the PM peak period, the overall traffic volume is higher with 955 vehicles traveling northbound and 865 vehicles traveling southbound on a "Boat Day" and 954 vehicles traveling northbound and 905 traveling southbound on a "Non Boat Day." Although the highway approaches of the intersection are uncontrolled, during the PM peak period vehicular queues from downstream intersections were observed extending to and periodically through the intersection with Prison Street. The critical traffic movement on the Honoapiilani Highway approaches is the northbound left-turn and through traffic movement which operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day."

g. Front Street and Dickenson Street

At the intersection with Dickenson Street, Front Street carries 266 vehicles northbound and 330 vehicles southbound during the AM peak period on a "Boat Day," and 309 vehicles northbound and 268 vehicles southbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 345 vehicles traveling northbound and 419 vehicles traveling southbound on a "Boat Day" and 349 vehicles traveling northbound and 441 southbound on a "Non Boat Day." The critical movement on the Front Street approaches is the southbound left-turn and through traffic movement which operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day." Pedestrian volumes crossing Front Street are also significantly lower than along Hotel Street with 61 pedestrians and 43 pedestrians observed crossing the street during the AM peak period of a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, pedestrian volumes are higher with 115 pedestrians and 192 pedestrians observed crossing the street on a "Boat Day" and "Non Boat Day," respectively.

The Dickenson Street approach of the intersection carries 77 vehicles and 59 vehicles westbound during the AM peak period on a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, traffic volumes are higher with 97 vehicles and 103 vehicles traveling westbound. Vehicular queue periodically formed on this

approach with average queue lengths of 3-5 vehicles observed during all peak periods. The Dickenson Street approach operates at LOS "B" and LOS "D" during the AM and PM peak periods, respectively, of a "Boat Day" and at LOS "B" during both peak periods of a "Non Boat Day." Pedestrian volumes crossing Dickenson Street are higher than those crossing Front Street with 218 pedestrians and 159 pedestrians observed crossing the street during the AM peak period of a "Boat Day" and "Non Boat Day," respectively. During the PM peak period, 450 pedestrians and 228 pedestrians were observed crossing the street on a "Boat Day" and "Non Boat Day," respectively.

h. Dickenson Street and Wainee Street

At the intersection with Wainee Street, Dickenson Street carries 115 vehicles eastbound and 144 vehicles westbound during the AM peak period on a "Boat Day," and 74 vehicles eastbound and 78 vehicles westbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 167 vehicles traveling eastbound and 230 vehicles traveling westbound on a "Boat Day" and 156 vehicles traveling eastbound and 201 traveling westbound on a "Non Boat Day." Vehicular queues periodically formed along Dickenson Street with average queue lengths of 3-5 vehicles observed during all peak periods. Occasionally, queues from the downstream intersection with Honoapiilani Highway extended through this intersection. The eastbound approach of Dickenson Street operates at LOS "A" and LOS "B" during the AM and PM peak periods, respectively, of a "Boat Day" and "Non Boat Day." The westbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, of a "Boat Day" and at "LOS "A" and LOS "B" during the AM and PM peak periods, respectively, of a "Non Boat Day."

The Wainee Street approaches of the intersection carry 183 vehicles northbound and 172 vehicles southbound during the AM peak period on a "Boat Day," and 200 vehicles northbound and 126 vehicles southbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 293 vehicles traveling northbound and 325 vehicles traveling southbound on a "Boat Day" and 298 vehicles traveling northbound and 352 traveling southbound on a "Non Boat Day." Vehicular queues periodically formed along Wainee Street with average queue lengths of 3-5 vehicles observed during all peak periods. Both approaches operate at LOS "B" and LOS "C" during the AM and PM peak periods, respectively, of a "Boat Day" and at LOS "A" and LOS "C" during the AM and PM peak periods, respectively, of a "Non Boat Day."

i. Dickenson Street and Honoapiilani Highway

At the intersection with Honoapiilani Highway, Dickenson Street carries 84 vehicles eastbound and 70 vehicles westbound during the AM peak period on a "Boat Day," and 79 vehicles eastbound and 83 vehicles westbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 117 vehicles traveling eastbound and 81 vehicles traveling westbound on a "Boat Day" and 134 vehicles traveling eastbound and 110 traveling westbound on a "Non Boat Day." Vehicular queues periodically formed along Dickenson Street with the most significant queuing occurring on the eastbound approach during the PM peak period with average queue lengths of 5-7 vehicles observed during this period. Occasionally, these queues extended through the upstream intersection with Wainee Street. Both approaches of Dickenson Street operate at LOS "D" during all peak periods.

The Honoapiilani Highway approaches of the intersection carry 812 vehicles northbound and 758 vehicles southbound during the AM

peak period on a "Boat Day," and 922 vehicles northbound and 659 vehicles southbound on a "Non Boat Day." During the PM peak period, traffic volumes are higher with 925 vehicles traveling northbound and 1,012 vehicles traveling southbound on a "Boat Day" and 925 vehicles traveling northbound and 935 traveling southbound on a "Non Boat Day." Vehicular queues periodically formed on the highway approaches of the intersection with the most significant queuing occurring on the southbound approach during the PM peak period. Average queue lengths of 15-20 vehicles were observed during this peak period. Occasionally, vehicular queues from downstream intersections were observed extending to and periodically through the intersection with Dickenson Street. Most of these queues would clear the intersection after each traffic signal cycle change, however some vehicles had to wait for more than one traffic signal cycle length. The traffic movements on the northbound approach and the southbound left-turn traffic movement operate at LOS "D" during all peak periods while the southbound through and right-turn traffic movement operates at LOS "C" during both peak periods of a "Boat Day" and at LOS B" and LOS "C" during the AM and PM peak periods, respectively, of a "Non Boat Day."

IV. PROJECTED TRAFFIC CONDITIONS

A. General

As previously stated, the new pier is intended to serve as the primary docking facility for the interisland ferries currently accessing the harbor. As such, the proposed improvements are not anticipated to generate any additional vehicular trips to or from the harbor. However, the proposed roadway modifications may result in the redistribution of traffic in the project vicinity.

B. Traffic Reassignment

Currently, most vehicles accessing the harbor area enter via Hotel Street, turn left onto Wharf Street, and exit via Canal Street, especially on a "Boat Day" when the north end of Wharf Street is blocked off to create a security buffer for the pier. However, the proposed roadway modifications would allow vehicular traffic to access the entire length of Wharf Street at all times thereby providing an alternate route to Front Street via Papalekane Street. However, due to the narrowness of the travel lane along Papalekane Street and the higher conflicting traffic volumes along Front Street near Papalekane Street, only 20% of the existing trips utilizing Canal Street to exit the harbor area were assumed to utilize Papalekane Street instead. The directional distribution of exiting vehicles at the intersection of Front Street and Papalekane Street was assumed to remain similar to the existing distribution at the Canal Street intersection.

C. Through Traffic Forecasting Methodology

An analysis of both historical traffic data and traffic projections contained within Maui Long-Range Land Transportation Plan (MLRLTP) was made to determine the appropriate ambient growth of traffic demands in the project vicinity. The historical data, using linear regression analyses, indicate an average annual traffic growth rate in the vicinity of approximately 1.0%, while the MLRLTP indicates a negative average annual traffic growth rate. Therefore, for conservative analysis purposes, the travel forecast used in this study is based upon the historical traffic count data obtained from the State Department of Transportation (DOT) resulting in an average annual traffic growth rate of 1.0%. Using Year 2006 as the base year, a growth rate factor of 1.04 was applied to the existing through traffic demands on the highway to achieve the projected ambient traffic demands for Year 2010.

D. Other Considerations

The following are other developments expected to be completed by the Year 2010 when the proposed improvements at the Lahaina Small Boat Harbor are anticipated to be completed:

- Maui Breakers project in Mahinahina, which includes 90 multi-family affordable residential units, is expected to be completed by the Year 2010.
- Villas at Kahana Ridge development includes 117 multi-family residential units and is expected to be completed by the Year 2010.
- Lokahi Pacific project in Lahaina with an expected completion by the Year 2010. The Lokahi Pacific project includes 12 single-family residential units.
- North Beach Lot 1 project of the Kaanapali Ocean Resort subdivision, which includes a total of 280 timeshare units. At the time of the study, North Beach Lot 1 included 103 units, with the balance of 177 units currently under construction and soon to be completed.
- North Beach Lot 2 of Kaanapali Ocean Resort subdivision, located adjacent to North Beach Lot 1, is currently in the planning stages at this writing, and includes approximately 258 multi-family units with potential lockouts for each unit.
- North Beach Lot 4 of the Kaanapali North Beach subdivision (also known as Honua Kai) located makai of Honoapiilani Highway in the vicinity of Lower Honoapiilani Road which includes a total of 700 multi-family units to be constructed in five phases, this first of which is expected to be completed by the Year 2009 and the rest of the phases is expected to be completed by the Year 2008.
- Kaanapali Golf Estates Parcels 22 and 23 residential subdivision located mauka of Honoapiilani highway within the South Beach Mauka are will include 132 single-family recreational homes. Construction is expected to start soon with completion anticipated by Year 2007.
- Pioneer Farms Phases I and II residential subdivision located in Kaanapali, mauka of Honoapiilani Highway. The proposed project will include 108 residential lots with expected completion by Year 2008.
- Maui Preparatory Academy located mauka of Honoapiilani Highway with access to and from the highway via the Napilihau Street intersection. The project is expected to include a total of 540 students from pre-kindergarten to grade 12with the expected completion by Year 2013. The project will be completed by three

phases. The first two phases will include an enrollment of 198 students total with build-out in Year 2008. Therefore, only 198 students will be included in the trip-generation for this analysis.

- Residences at Kapalua Bay project located in Kapalua on the makai side of Honoapiilani Highway. The proposed project entails the redevelopment of the existing Kapalua Bay Hotel to include approximately 155, 2- and 3-bedroom units with expected completion by Year 2008.
- Villages at Lealii, a residential development that includes a total of 4,846 dwelling units, 2,006 single-family units and 2,840 multi-family units. The proposed project is expected to include 104 single-family units with build-out in Year 2006. Build-out for the rest of the residential development is expected to occur beyond the expected completion of the proposed residential development.
- Royal Lahaina Resort project located in Kaanapali on the makai side of Honoapiilani Highway. The proposed project entails the revitalization of the existing resort to include approximately 330 hotel units in a 12-story tower and 125 condominium/hotel units in 11 new building with expected completion by Year 2009.
- Lahaina Cannery Mall located adjacent to Honoapiilani Highway near the intersections with Keawe Street and Kapunakea Street. The proposed expansion project is anticipated to completed by Year 2008 and is expected to increase the existing floor area by approximately 33,160 square feet.

The traffic generated by the above projects, as applicable, were estimated based on the generation rates and procedures identified in the Institute of Transportation Engineers publication on trip generation for specific land use types, and other traffic studies associated with each proposed development. The determined traffic generation was applied to the ambient traffic growth, thus incorporating these additional applicable projects in the baseline traffic conditions. The purpose of including traffic demands from these other developments is to obtain a more realistic traffic forecast model and to ensure that any adverse traffic operational impacts can be properly addressed. Thus, the traffic analysis would include the cumulative traffic

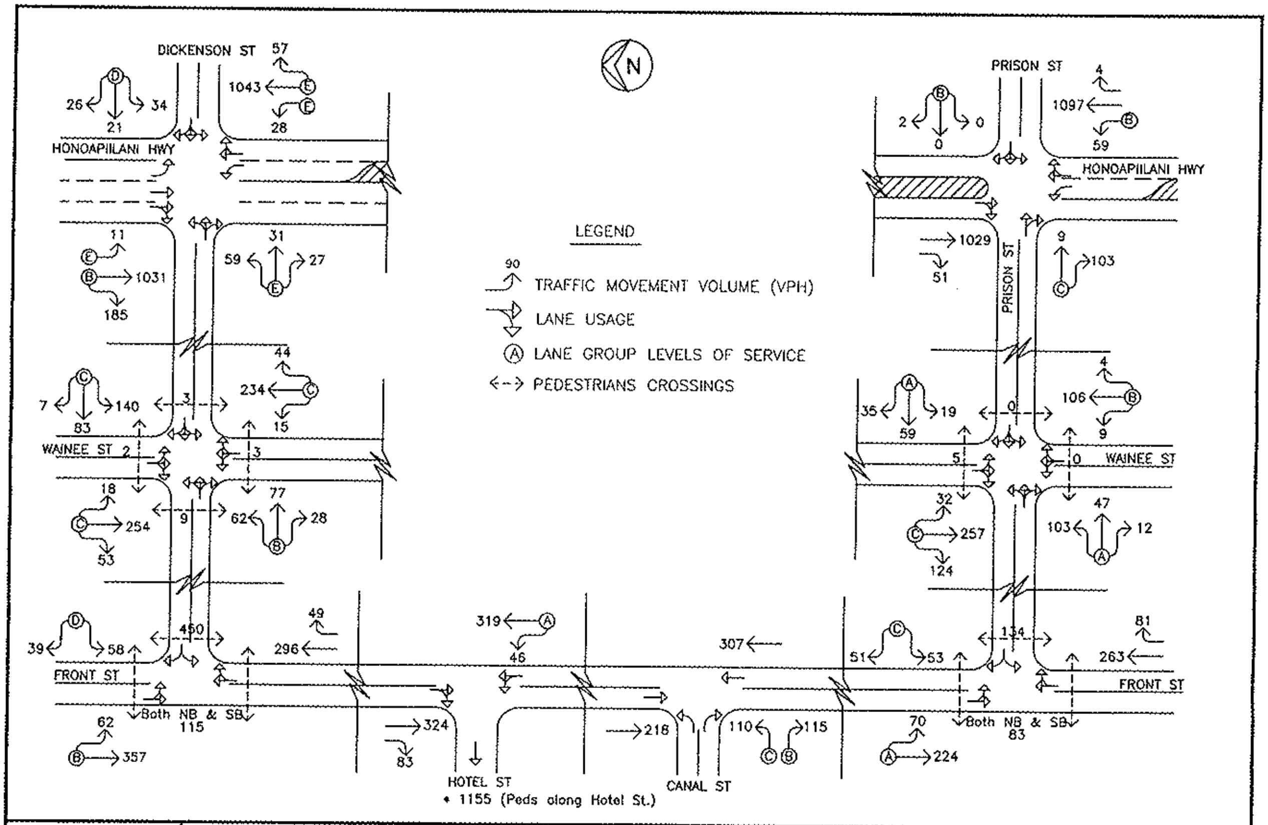
demands on the roadways in the vicinity of the project at its build-out. Should there be additional developments not accounted for in the analysis, the average annual ambient traffic growth rate utilized in the traffic forecast is expected to encompass the increase traffic demands resulting from these unknown developments. Should there be no additional developments other than those stated above, including the average annual ambient growth rate would represent a conservative traffic analysis in terms of future traffic projections.

E. Total Traffic Volumes With Project

The Year 2010 cumulative AM and PM peak hour traffic conditions with the implementation of improvements at the Lahaina Small Boat Harbor on a "Boat Day" and "Non Boat Day" are shown in Figures 7 to 10, and summarized in Tables 1 and 2. The existing levels of service are included for comparison purposes. LOS calculations are included in Appendix D.

Table 1: Existing and Projected Levels of Service on a "Boat Day"

Intersection	Critical Movement		AM		PM	
			Exist	Year 2010 w/ Proj	Exist	Year 2010 w/ Proj
Front St/Hotel St	Northbound	LT-TH	A	A	A	A
Front St/Canal St	Eastbound	LT	B	B	C	C
		RT	A	A	B	B
Front St/Prison St	Westbound	LT-RT	C	C	C	C
	Southbound	LT-TH	A	A	A	A
Prison St/Wainee St	Eastbound	LT-TH-RT	A	A	A	A
	Westbound	LT-TH-RT	A	A	A	A
	Northbound	LT-TH-RT	C	C	B	B
	Southbound	LT-TH-RT	B	B	C	C
Prison St/ Honoapiilani Hwy	Eastbound	TH-RT	B	B	C	C
	Westbound	LT-TH-RT	B	B	B	B
	Northbound	LT	A	A	B	B



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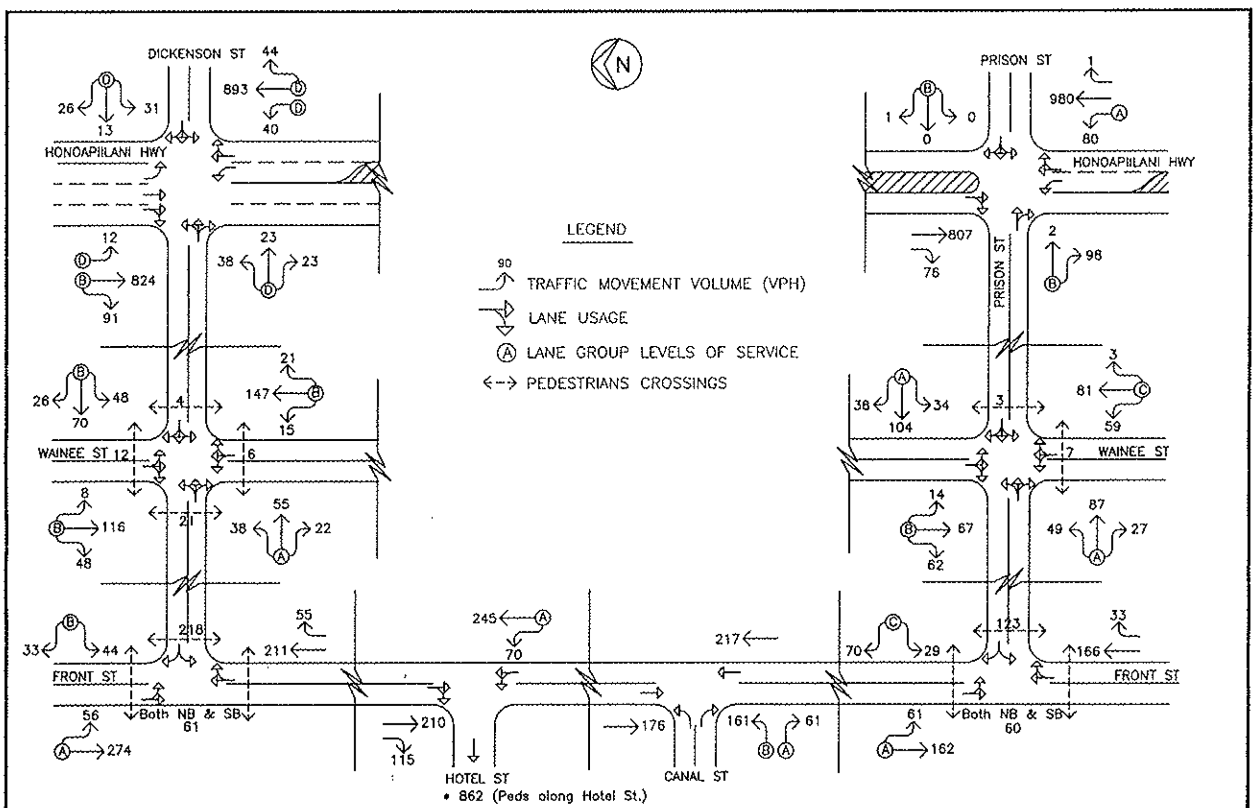
LAHAINA SMALL BOAT HARBOR

YEAR 2010 PM PEAK HOURS OF TRAFFIC WITH PROJECT - BOAT DAY

FIGURE 8



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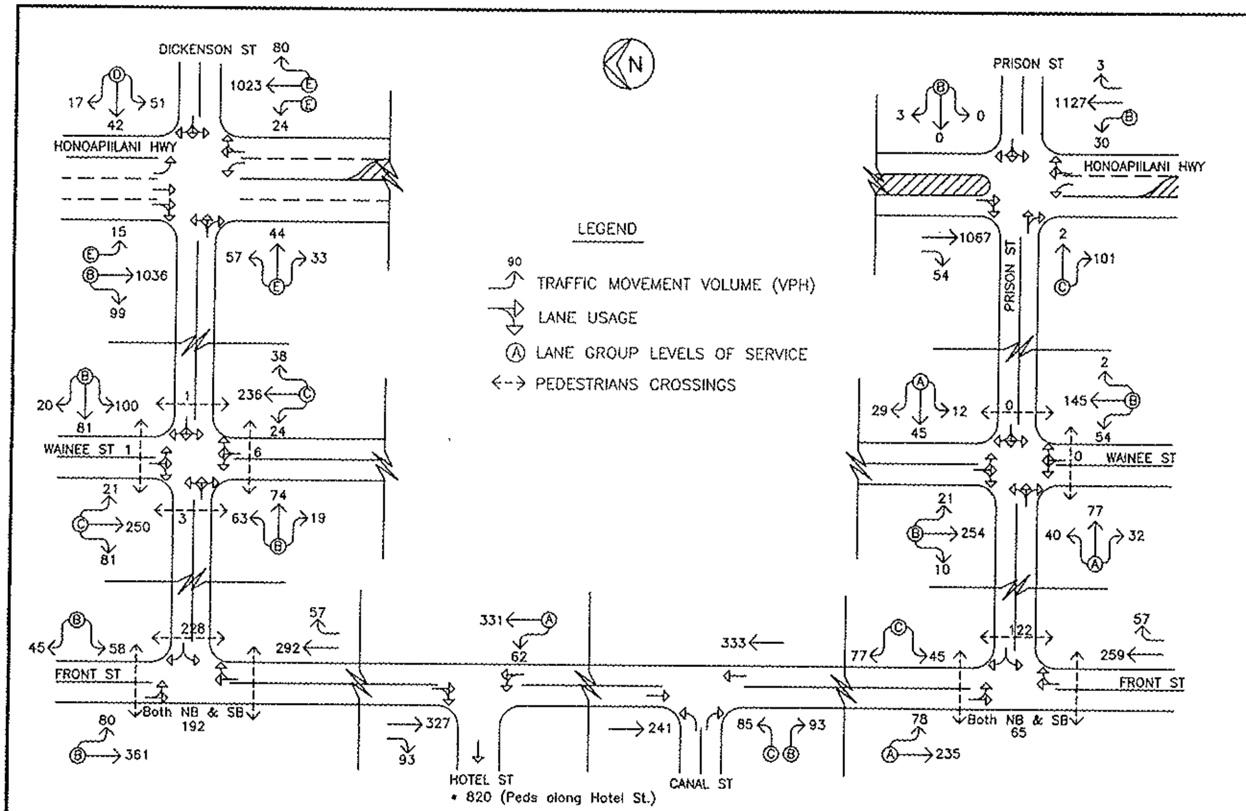
LAHAINA SMALL BOAT HARBOR

YEAR 2010 AM PEAK HOURS OF TRAFFIC WITH PROJECT - BOAT DAY

FIGURE 7



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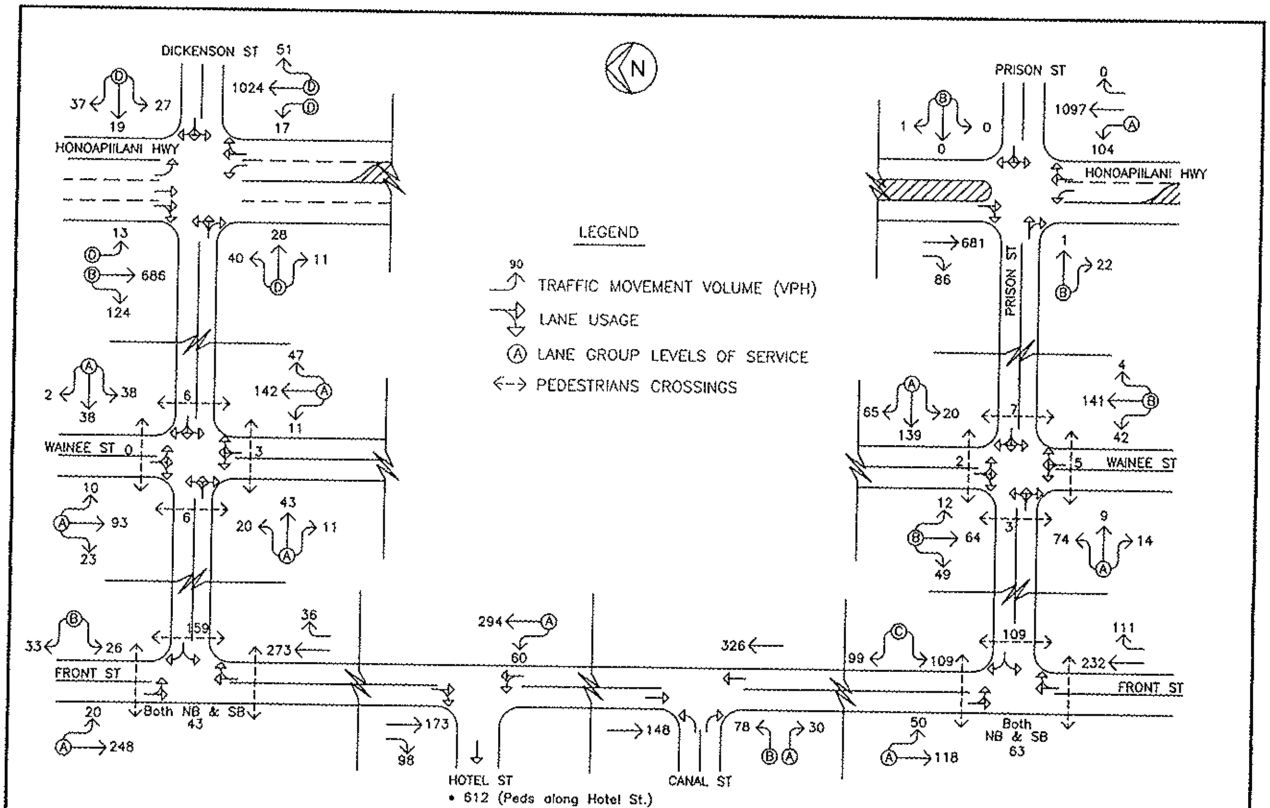
LAHAINA SMALL BOAT HARBOR

YEAR 2010 PM PEAK HOURS OF TRAFFIC WITH PROJECT - NON BOAT DAY

FIGURE 10



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LAHAINA SMALL BOAT HARBOR

YEAR 2010 AM PEAK HOURS OF TRAFFIC WITH PROJECT - NON BOAT DAY

FIGURE 9

Table 1: Existing and Projected Levels of Service on a "Boat Day" (Cont'd)

Intersection	Critical Movement		AM Exist	AM Year 2010 w/ Proj	PM Exist	PM Year 2010 w/ Proj
Front St/Dickenson St	Westbound	LT-RT	B	B	D	D
	Southbound	LT-TH	A	A	B	B
Dickenson St/ Wainee St	Eastbound	LT-TH-RT	A	A	B	B
	Westbound	LT-TH-RT	B	B	C	C
	Northbound	LT-TH-RT	B	B	C	C
	Southbound	LT-TH-RT	B	B	C	C
Dickenson St/ Honoapiilani Hwy	Eastbound	LT-TH-RT	D	D	D	E
	Westbound	LT-TH-RT	D	D	D	D
	Northbound	LT	D	D	D	E
		TH-RT	D	D	D	E
	Southbound	LT	D	D	D	E
		TH-RT	C	B	C	B

Table 2: Existing and Projected Levels of Service on a "Non Boat Day"

Intersection	Critical Movement		AM Exist	AM Year 2010 w/ Proj	PM Exist	PM Year 2010 w/ Proj
Front St/Hotel St	Northbound	LT-TH	A	A	A	A
Front St/Canal St	Eastbound	LT	B	B	C	C
		RT	A	A	B	B
Front St/Prison St	Westbound	LT-RT	C	C	C	C
	Southbound	LT-TH	A	A	A	A
Prison St/Wainee St	Eastbound	LT-TH-RT	A	A	A	A
	Westbound	LT-TH-RT	A	A	A	A
	Northbound	LT-TH-RT	B	B	B	B
	Southbound	LT-TH-RT	B	B	B	B

Table 2: Existing and Projected Levels of Service on a "Non Boat Day" (Cont'd)

Intersection	Critical Movement		AM Exist	AM Year 2010 w/ Proj	PM Exist	PM Year 2010 w/ Proj
Prison St/ Honoapiilani Hwy	Eastbound	TH-RT	B	B	C	C
	Westbound	LT-TH-RT	B	B	B	B
	Northbound	LT	A	A	B	B
Front St/Dickenson St	Westbound	LT-RT	B	B	B	B
	Southbound	LT-TH	A	A	B	B
Dickenson St/ Wainee St	Eastbound	LT-TH-RT	A	A	B	B
	Westbound	LT-TH-RT	A	A	B	B
	Northbound	LT-TH-RT	A	A	C	C
	Southbound	LT-TH-RT	A	A	C	C
Dickenson St/ Honoapiilani Hwy	Eastbound	LT-TH-RT	D	D	D	E
	Westbound	LT-TH-RT	D	D	D	D
	Northbound	LT	D	D	D	E
		TH-RT	D	D	D	E
	Southbound	LT	D	D	D	E
		TH-RT	B	B	C	B

Traffic operations in the vicinity of the Lahaina Small Boat Harbor with the implementation of the proposed improvements are expected, in general, to remain similar to existing conditions despite the slight redistribution in traffic in the project vicinity. The traffic movements on the eastbound and northbound approaches of the intersection with Honoapiilani Highway and Dickenson Street, as well as, the left-turn traffic movement on the southbound approach are anticipated to deteriorate from LOS "D" to LOS "E" during the PM peak period due to the anticipated ambient growth in traffic along the highway. In addition, the southbound through and right-turn traffic movement at that intersection is anticipated to improve from LOS "C" to LOS "B" during both peak periods of a "Boat Day" and the PM peak period of a "Non Boat Day" resulting from the shift in green times at that intersection to accommodate the increase in traffic along the highway. The other critical movements at that intersection, as well as, the remaining study intersections are anticipated to operate at levels of service similar to existing conditions during all peak periods.

F. Pedestrian Traffic

Pedestrian traffic in the vicinity of the Lahaina Small Boat Harbor is currently heavy, especially on a "Boat Day." Field investigations indicate that there are approximately 862 pedestrians and 1,155 pedestrians traveling along Hotel Street during the AM and PM peak periods, respectively, of a "Boat Day." On a "Non Boat Day," the volume of pedestrians is slightly less with approximately 612 pedestrians and 820 pedestrians traveling along Hotel Street during the AM and PM peak periods, respectively. To accommodate these pedestrians, concrete sidewalks are provided along the north side of Hotel Street and the west side of Wharf Street along the pier. In addition, meandering sidewalks are provided through the park between Hotel Street and Canal Street.

The proposed improvements at the harbor are intended to provide additional loading/unloading space for the vessels currently utilizing the existing pier, the volume of pedestrians in the vicinity of the harbor is not expected to increase significantly. However, in conjunction with the project, sidewalk, parking, and roadway modifications are currently being planned to alleviate the existing pedestrian and vehicular congestion within the harbor area. The existing sidewalk along Hotel Street narrows to approximately 3'-4" in width as it nears Wharf Street. This narrow width is not sufficient to accommodate the existing high volume of pedestrian traffic in the vicinity. As such, many pedestrians are forced to utilize the adjacent roadway pavement instead resulting in an unsafe pedestrian environment. The proposed project entails the widening of this portion of the sidewalk along Hotel Street by approximately 4' to provide additional pedestrian capacity. In conjunction with this sidewalk widening, pedestrian traffic management strategies could also be implemented by harbor personnel to channelize pedestrian traffic along the improved pedestrian facilities (i.e., concrete sidewalks) in the vicinity thereby reducing the conflicts with vehicular traffic. Personnel or directional signs could be utilized to

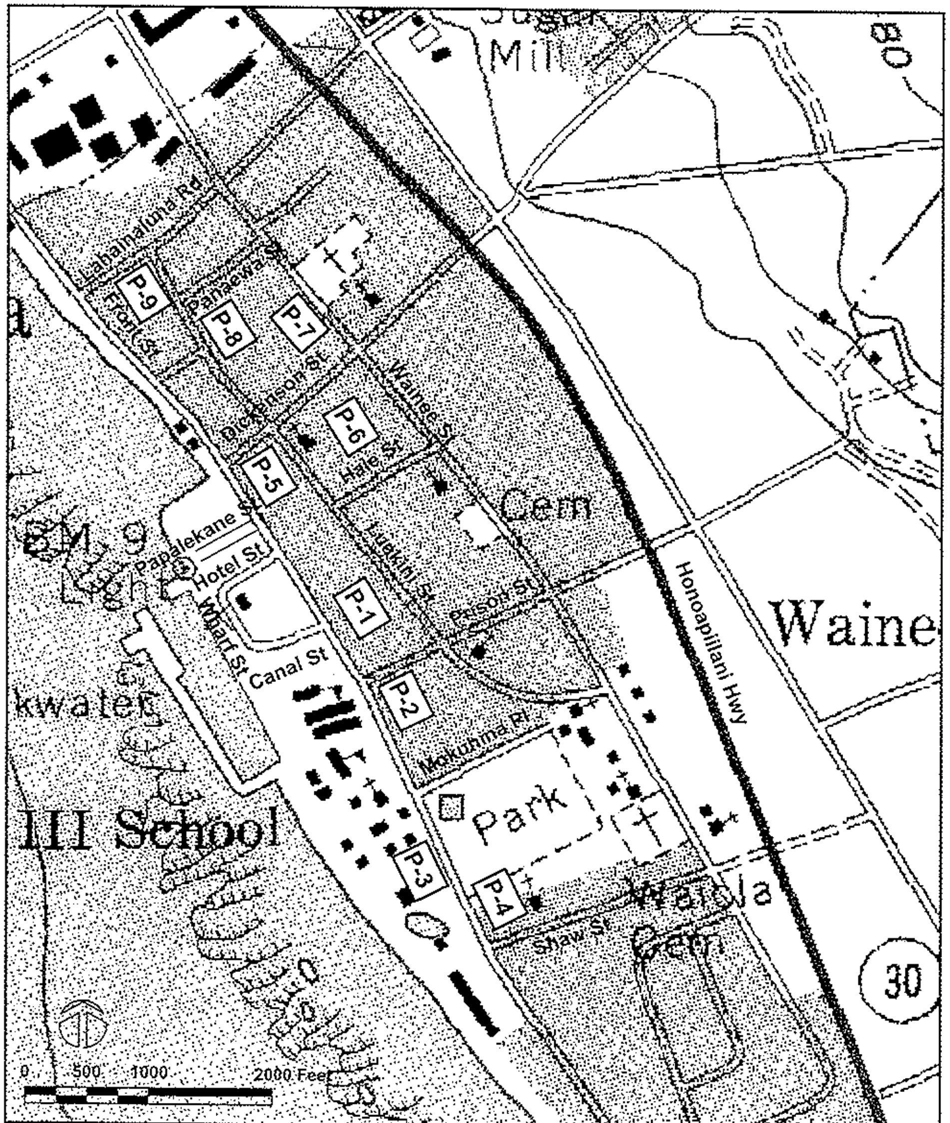
channelize pedestrians along the newly widened sidewalk along the north side of Hotel Street and the existing sidewalk along the west side of Wharf Street.

G. Parking

Immediately adjacent to the existing pier there is a drop-off/loading zone that has a total of four parking stalls, one of which is a reserved stall. Just north of this zone, there are two accessible parking stalls located in front of the historic Light House. As previously stated, on a "Boat Day," the north end of Wharf Street which includes this area is blocked off by removable bollards. On a "Non-Boat Day," these stalls are utilized heavily. According to harbor staff, vehicles are regularly double- or triple-parking in these stalls. In addition to these stalls immediately adjacent to the existing pier, there are 32 additional parking stalls located on the south side of the harbor west of Kamehameha III Elementary School that are available to vehicles with parking permits.

Public parking within the harbor area is available along Hotel Street, Wharf Street, Canal Street, and Papalekane Street. Hotel Street has 11 parking stalls and two loading zones along its length while Canal Street has 10 parking stalls along its length. Along Wharf Street, there are 27 parking stalls, one of which is accessible, and a loading zone adjacent to the Pioneer Inn Lobby which is available to hotel guests at all times. Papalekane Street has four parking stalls, one of which is accessible, for use by visitors to the adjacent Library.

Outside the harbor area, public parking is available along Front Street and other intersecting streets, as well as, in private and public parking lots. A survey of the existing inventory in these nearby parking lots was conducted by the State of Hawaii Department of Land and Natural Resources (DNLR) in May 2005. This survey included nine parking areas in the vicinity of the harbor (see Figure 11) and noted the operator, number of stalls, and cost per hour for each location. The results of the study, which are summarized in Table 3, indicate that there are a total of 690 marked parking stalls, 40 unmarked parking stalls, 10 bus parking stalls, and 6 limousine parking stalls.



WILSON OKAMOTO CORPORATION ENGINEERS - PLANNERS

LAHAINA SMALL BOAT HARBOR

DLNR Parking Survey Locations

FIGURE 11

Table 3: DLNR Parking Survey

Parking ID	Location	Operator	# of Stalls	Paved	Cost Per Hour	
P-1	Mauka of the intersection of Canal and Front Streets (behind Burger King)	Parking Diamond Service	110	Yes	0-2 2-4 4-10 24 48 72 96	\$5 \$10 \$15 \$20 \$40 \$60 \$80
P-2	Mauka of the intersection of Prison and Front Streets	County of Maui	120 marked 40 unmarked 6 bus stalls	Yes No Yes	Free/3-hour limit	
P-3	Kamehameha Iki Park Adjacent to 505 Front Street Shopping Center	County of Maui	30	Yes	Free	
P-4	Mauka of the intersection of Shaw and Front Streets Mauka of 505 Front	Parking Diamond Service	74	Yes	0-2 2-5 All day up to 5 PM Evenings 5 PM to 6 AM	\$5 \$10 \$10 \$5
P-5	120 Dickerson Street Makai of Luakini Street	Lahaina Restoration Foundation	62	Yes	0-2 2-8 24 48 72 96	\$5 \$10 \$15 \$30 \$45 \$60
P-6	Mauka of the intersection of Hale and Luakini Street Behind the Wharf Cinema Center	Wharf Cinema Center	100 4 bus 6 limo	Yes	0-1/2 1/2-1 Overnight Ferry (day) Ferry (evenings)	\$1 \$2 \$5 \$2.50 \$3.00
P-7	Makai of the intersections of Wainee and Dickerson Streets	Republic Parking	91	Yes	0-2 2-8 24 48	\$4 \$8 \$12 \$24
P-8	Mauka of Panaewa and Luakini Streets	Maui County	73	Yes	Free Closed 2 to 4 AM	
P-9	Off of Luakini Street behind Front Street shops	PPS Parking	30	Yes	0-1 1-3 All day up to 5 PM 5 PM to 7 AM	\$2 \$3 \$6 \$5

V. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study associated with the proposed project to be incorporated during the design phase:

1. Widen the sidewalk along the north side of Hotel Street to provide additional capacity for pedestrian traffic.
2. Consider implementing pedestrian traffic management strategies to channelize pedestrian traffic along the improved pedestrian facilities.
3. Ensure that all new and modified sidewalks are constructed in accordance with the American with Disabilities Act (ADA) and that all pedestrian routes/facilities are maintained in passable condition during the construction phase of the project.
4. The County of Maui Police Department, through the Lahaina Community Police Officer, has expressed concerns regarding the management of vehicular traffic during the construction phase of the project. Consider the use of off-duty police officers to direct traffic in the vicinity of the harbor during construction to ensure the safe progress of both vehicular and pedestrian traffic. In addition, ensure that adequate parking for construction vehicles and personnel is provided to prevent increased congestion in the harbor area.

VI. CONCLUSION

The proposed improvements to the Lahaina Small Boat Harbor includes the construction of a new ferry pier with a pedestrian walkway connection to the existing pier, sidewalk, parking, and roadway modifications, and the replacement of an existing comfort station, Harbor Master's Office, and ancillary structures. These improvements are intended to serve existing vessels currently utilizing the harbor and are therefore not anticipated to generate any additional vehicular or pedestrian traffic in the vicinity of the harbor. As such, traffic volumes in the vicinity of the Lahaina Small Boat Harbor with the implementation of the proposed improvements are expected to remain similar to existing conditions. However, the proposed sidewalk, parking, and roadway modifications, in conjunction with the implementation of the aforementioned recommendations, should help to alleviate the existing pedestrian and vehicular congestion within the harbor area.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D4-3889
Counted By: TO
Weather: Clear

File Name : frohotP(cruise)
Site Code : 00000003
Start Date : 3/9/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Hotel Street (Entrance Only) Westbound					Front Street Northbound					Papelekane Street (Exit Only) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	0	0	23	0	23	0	0	0	238	238	10	0	0	0	10	2	0	0	0	2	273
03:45 PM	0	0	19	0	19	0	0	0	306	306	12	0	0	0	12	2	0	0	0	2	339
Total	0	0	42	0	42	0	0	0	544	544	22	0	0	0	22	4	0	0	0	4	612
04:00 PM	0	0	20	0	20	0	0	0	285	285	9	0	0	0	9	2	0	0	0	2	316
04:15 PM	0	0	21	0	21	0	0	0	326	326	15	0	0	0	15	0	0	1	0	1	363
04:30 PM	0	0	20	0	20	0	0	0	249	249	29	0	0	0	29	2	0	0	0	2	300
04:45 PM	0	0	23	0	23	0	0	0	214	214	16	0	0	0	16	2	0	1	0	3	256
Total	0	0	84	0	84	0	0	0	1074	1074	69	0	0	0	69	6	0	2	0	8	1235
05:00 PM	0	0	20	0	20	0	0	0	246	246	8	0	0	0	8	3	0	0	0	3	277
05:15 PM	0	0	16	0	16	0	0	0	194	194	15	0	0	0	15	1	0	0	0	1	226
Grand Total	0	0	162	0	162	0	0	0	2058	2058	114	0	0	0	114	14	0	2	0	16	2350
Apprch %	0.0	0.0	100.0	0.0		0.0	0.0	0.0	100.0		100.0	0.0	0.0	0.0		87.5	0.0	12.5	0.0		
Total %	0.0	0.0	6.9	0.0	6.9	0.0	0.0	0.0	87.6	87.6	4.9	0.0	0.0	0.0	4.9	0.6	0.0	0.1	0.0	0.7	

	Front Street Southbound				Hotel Street (Entrance Only) Westbound				Front Street Northbound				Papelekane Street (Exit Only) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Intersection	04:00 PM																
Volume	0	0	84	84	0	0	0	0	69	0	0	69	6	0	2	8	161
Percent	0.0	0.0	100.0		0.0	0.0	0.0		100.0	0.0	0.0		75.0	0.0	25.0		
04:30 Volume	0	0	20	20	0	0	0	0	29	0	0	29	2	0	0	2	51
Peak Factor																	0.789
High Int.	04:45 PM				3:15:00 PM				04:30 PM				04:45 PM				
Volume	0	0	23	23	0	0	0	0	29	0	0	29	2	0	1	3	
Peak Factor				0.913								0.595				0.667	

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Start Date : 3/9/2006
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Groups Printed- Unshifted

	Front Street Southbound					Hotel Street (Entrance Only) Westbound					Front Street Northbound					Papelekane Street (Exit Only) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
08:30 AM	0	0	22	0	22	0	0	0	49	49	25	0	0	0	25	0	0	0	0	0	96
08:45 AM	0	0	25	0	25	0	0	0	82	82	33	0	0	0	33	0	0	0	0	0	140
Total	0	0	47	0	47	0	0	0	131	131	58	0	0	0	58	0	0	0	0	0	236
09:00 AM	0	0	22	0	22	0	0	0	84	84	21	0	0	0	21	1	0	0	0	1	128
09:15 AM	0	0	24	0	24	0	0	0	156	156	19	0	0	0	19	0	0	1	0	1	200
09:30 AM	0	0	31	0	31	0	0	0	192	192	10	0	0	0	10	1	0	4	0	5	238
09:45 AM	0	0	23	0	23	0	0	0	207	207	14	0	0	0	14	0	0	1	0	1	245
Total	0	0	100	0	100	0	0	0	639	639	64	0	0	0	64	2	0	6	0	8	811
10:00 AM	0	0	32	0	32	0	0	0	195	195	24	0	0	0	24	1	0	1	0	2	253
10:15 AM	0	0	29	0	29	0	0	0	268	268	22	0	0	0	22	2	0	0	0	2	321
Grand Total	0	0	208	0	208	0	0	0	1233	1233	168	0	0	0	168	5	0	7	0	12	1621
Apprch %	0.0	0.0	100.0	0.0		0.0	0.0	0.0	100.0		100.0	0.0	0.0	0.0		41.7	0.0	58.3	0.0		
Total %	0.0	0.0	12.8	0.0	12.8	0.0	0.0	0.0	76.1	76.1	10.4	0.0	0.0	0.0	10.4	0.3	0.0	0.4	0.0	0.7	

	Front Street Southbound				Hotel Street (Entrance Only) Westbound				Front Street Northbound				Papelekane Street (Exit Only) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 08:30 AM to 10:15 AM - Peak 1 of 1																	
Intersection	09:30 AM																
Volume	0	0	115	115	0	0	0	0	70	0	0	70	4	0	6	10	195
Percent	0.0	0.0	100.0		0.0	0.0	0.0		100.0	0.0	0.0		40.0	0.0	60.0		
10:00 Volume	0	0	32	32	0	0	0	0	24	0	0	24	1	0	1	2	58
Peak Factor																	0.841
High Int.	10:00 AM				8:15:00 AM				10:00 AM				09:30 AM				
Volume	0	0	32	32	0	0	0	0	24	0	0	24	1	0	4	5	
Peak Factor				0.898								0.729				0.500	

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Site Code : 00000002
Start Date : 3/9/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Prison Street Westbound					Front Street Northbound						
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
08:30 AM	15	30	0	8	53	7	0	19	11	37	0	20	4	0	24	0	114
08:45 AM	15	46	0	12	73	9	0	28	34	71	0	32	3	0	35	0	179
Total	30	76	0	20	126	16	0	47	45	108	0	52	7	0	59	0	293
09:00 AM	19	31	0	9	59	12	0	14	27	53	0	30	5	0	35	0	147
09:15 AM	20	40	0	18	78	2	0	24	33	59	0	38	4	0	42	0	179
09:30 AM	23	37	0	13	73	7	0	19	26	52	0	32	9	0	41	0	166
09:45 AM	11	41	0	8	60	4	0	17	22	43	0	40	7	0	47	0	150
Total	73	149	0	48	270	25	0	74	108	207	0	140	25	0	165	0	642
10:00 AM	14	44	0	26	84	12	0	19	42	73	0	43	10	0	53	0	210
10:15 AM	13	40	0	13	66	6	0	15	33	54	0	51	7	0	58	0	178
Grand Total	130	309	0	107	546	59	0	155	228	442	0	286	49	0	335	0	1323
Apprch %	23.8	56.6	0.0	19.6		13.3	0.0	35.1	51.6		0.0	85.4	14.6	0.0			
Total %	9.8	23.4	0.0	8.1	41.3	4.5	0.0	11.7	17.2	33.4	0.0	21.6	3.7	0.0	25.3	0.0	

	Front Street Southbound				Prison Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 08:30 AM to 10:15 AM - Peak 1 of 1														
Intersection	09:30 AM													
Volume	61	162	0	223	29	0	70	99	0	166	33	199	0	521
Percent	27.4	72.6	0.0		29.3	0.0	70.7		0.0	83.4	16.6			
10:00 Volume	14	44	0	58	12	0	19	31	0	43	10	53	0	142
Peak Factor														0.917
High Int.	09:30 AM				10:00 AM				10:15 AM				8:15:00 AM	
Volume	23	37	0	60	12	0	19	31	0	51	7	58		
Peak Factor				0.929				0.798				0.858		

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Counter: D4-3889
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File Name : frohotP
Site Code : 00000008
Start Date : 3/8/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Hotel Street (Entrance Only) Westbound					Front Street Northbound					Papelekane Street (Exit Only) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:30 PM	0	0	25	0	25	0	0	0	201	201	18	0	0	0	18	0	0	0	0	0	244
03:45 PM	0	0	25	0	25	0	0	0	208	208	19	0	0	0	19	0	0	0	0	0	252
Total	0	0	50	0	50	0	0	0	409	409	37	0	0	0	37	0	0	0	0	0	496
04:00 PM	0	0	27	0	27	0	0	0	218	218	9	0	0	0	9	0	0	0	0	0	254
04:15 PM	0	0	16	0	16	0	0	0	193	193	16	0	0	0	16	0	0	0	0	0	225
04:30 PM	0	0	21	0	21	0	0	0	180	180	17	0	0	0	17	0	0	0	0	0	218
04:45 PM	0	0	21	0	21	0	0	0	196	196	15	0	0	0	15	0	0	0	0	0	232
Total	0	0	85	0	85	0	0	0	787	787	57	0	0	0	57	0	0	0	0	0	929
05:00 PM	0	0	18	0	18	0	0	0	158	158	12	0	0	0	12	0	0	0	0	0	188
05:15 PM	0	0	21	0	21	0	0	0	126	126	17	0	0	0	17	0	0	0	0	0	164
Grand Total	0	0	174	0	174	0	0	0	1480	1480	123	0	0	0	123	0	0	0	0	0	1777
Apprch %	0.0	0.0	100.0	0.0		0.0	0.0	0.0	100.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	9.8	0.0	9.8	0.0	0.0	0.0	83.3	83.3	6.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	

	Front Street Southbound				Hotel Street (Entrance Only) Westbound				Front Street Northbound				Papelekane Street (Exit Only) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Intersection	03:30 PM																
Volume	0	0	93	93	0	0	0	0	62	0	0	62	0	0	0	0	155
Percent	0.0	0.0	100.0		0.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
03:45 Volume	0	0	25	25	0	0	0	0	19	0	0	19	0	0	0	0	44
Peak Factor																	0.881
High Int.	04:00 PM				3:15:00 PM				03:45 PM				3:15:00 PM				
Volume	0	0	27	27	0	0	0	0	19	0	0	19					
Peak Factor				0.861								0.816					

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Counter: D4-3891
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Weather: Clear

File Name : fropriP
Site Code : 00000002
Start Date : 3/8/2006
Page No : 1

Groups Printed- Unshifted

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Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
03:30 PM	17	66	0	27	110	19	0	21	40	80	0	57	14	0	71	0	261
03:45 PM	19	41	0	7	67	8	0	22	34	64	0	59	14	0	73	0	204
Total	36	107	0	34	177	27	0	43	74	144	0	116	28	0	144	0	465
04:00 PM	27	72	0	9	108	8	0	18	22	48	0	65	12	0	77	0	233
04:15 PM	15	56	0	22	93	10	0	16	26	52	0	78	17	0	95	0	240
04:30 PM	14	73	0	27	114	14	0	15	19	48	0	50	7	0	57	0	219
04:45 PM	14	41	0	13	68	18	0	12	34	64	0	56	17	0	73	0	205
Total	70	242	0	71	383	50	0	61	101	212	0	249	53	0	302	0	897
05:00 PM	13	55	0	14	82	13	0	9	17	39	0	48	11	0	59	0	180
05:15 PM	11	43	0	14	68	19	0	17	23	59	0	43	5	0	48	0	175
Grand Total	130	447	0	133	710	109	0	130	215	454	0	456	97	0	553	0	1717
Apprch %	18.3	63.0	0.0	18.7		24.0	0.0	28.6	47.4		0.0	82.5	17.5	0.0			
Total %	7.6	26.0	0.0	7.7	41.4	6.3	0.0	7.6	12.5	26.4	0.0	26.6	5.6	0.0	32.2	0.0	

	Front Street Southbound				Prison Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1														
Intersection	03:30 PM													
Volume	78	235	0	313	45	0	77	122	0	259	57	316	0	751
Percent	24.9	75.1	0.0		36.9	0.0	63.1		0.0	82.0	18.0			
04:00 Volume	27	72	0	99	8	0	18	26	0	65	12	77	0	202
Peak Factor														0.929
High Int.	04:00 PM				03:30 PM				04:15 PM				3:15:00 PM	
Volume	27	72	0	99	19	0	21	40	0	78	17	95		
Peak Factor				0.790				0.763				0.832		

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
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Counter: D4-3891
Counted By: IW
Weather: Clear

File Name : fropriP(cruise)
Site Code : 00000002
Start Date : 3/9/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Prison Street Westbound					Front Street Northbound						
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
03:30 PM	15	55	0	17	87	12	0	17	28	57	0	56	17	0	73	0	217
03:45 PM	20	54	0	39	113	11	0	17	39	67	0	60	14	0	74	0	254
Total	35	109	0	56	200	23	0	34	67	124	0	116	31	0	147	0	471
04:00 PM	26	54	0	19	99	16	0	9	44	69	0	66	27	0	93	0	261
04:15 PM	12	55	0	16	83	13	0	11	27	51	0	74	24	0	98	0	232
04:30 PM	12	61	0	9	82	13	2	14	24	53	0	63	16	0	79	0	214
04:45 PM	16	50	0	27	93	16	0	14	48	78	0	54	13	0	67	0	238
Total	66	220	0	71	357	58	2	48	143	251	0	257	80	0	337	0	945
05:00 PM	23	47	0	22	92	11	0	10	54	75	0	59	9	0	68	0	235
05:15 PM	12	39	0	16	67	13	0	14	39	66	0	48	20	0	68	0	201
Grand Total	136	415	0	165	716	105	2	106	303	516	0	480	140	0	620	0	1852
Apprch %	19.0	58.0	0.0	23.0		20.3	0.4	20.5	58.7		0.0	77.4	22.6	0.0			
Total %	7.3	22.4	0.0	8.9	38.7	5.7	0.1	5.7	16.4	27.9	0.0	25.9	7.6	0.0	33.5	0.0	

	Front Street Southbound				Prison Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1														
Intersection	03:45 PM													
Volume	70	224	0	294	53	2	51	106	0	263	81	344	0	744
Percent	23.8	76.2	0.0		50.0	1.9	48.1		0.0	76.5	23.5			
04:00 Volume	26	54	0	80	16	0	9	25	0	66	27	93	0	198
Peak Factor														0.939
High Int.	04:00 PM				04:30 PM				04:15 PM				3:15:00 PM	
Volume	26	54	0	80	13	2	14	29	0	74	24	98		
Peak Factor				0.919				0.914				0.878		

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0528
Counted: TO
Weather: CLEAR

File Name : waipriP (cruise)
Site Code : 00000006
Start Date : 4/18/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Prison Street Westbound					Wainee Street Northbound					Prison Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	13	41	41	2	97	8	19	3	0	30	1	25	1	0	27	25	10	4	0	39	193
03:45 PM	7	74	37	3	121	5	17	12	0	34	5	36	0	0	41	22	10	4	0	36	232
Total	20	115	78	5	218	13	36	15	0	64	6	61	1	0	68	47	20	8	0	75	425
04:00 PM	6	70	21	0	97	6	9	11	0	26	1	22	3	0	26	29	14	3	0	46	195
04:15 PM	6	72	25	0	103	0	14	9	0	23	2	23	0	0	25	27	13	1	0	41	192
04:30 PM	6	60	30	0	96	1	5	8	0	14	3	16	0	0	19	22	16	3	0	41	170
04:45 PM	10	49	31	1	91	0	8	10	0	18	3	19	0	0	22	20	9	6	0	35	166
Total	28	251	107	1	387	7	36	38	0	81	9	80	3	0	92	98	52	13	0	163	723
05:00 PM	5	48	19	0	72	5	19	13	0	37	2	23	0	0	25	16	7	1	0	24	158
05:15 PM	6	47	9	0	62	6	17	10	0	33	0	13	0	0	13	23	8	3	0	34	142
Grand Total	59	461	213	6	739	31	108	76	0	215	17	177	4	0	198	184	87	25	0	296	1448
Apprch %	8	62.4	28.8	0.8		14.4	50.2	35.3	0		8.6	89.4	2	0		62.2	29.4	8.4	0		
Total %	4.1	31.8	14.7	0.4	51	2.1	7.5	5.2	0	14.8	1.2	12.2	0.3	0	13.7	12.7	6	1.7	0	20.4	

	Wainee Street Southbound				Prison Street Westbound				Wainee Street Northbound				Prison Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	13	41	41	95	8	19	3	30	1	25	1	27	25	10	4	39	191
03:45 PM	7	74	37	118	5	17	12	34	5	36	0	41	22	10	4	36	229
04:00 PM	6	70	21	97	6	9	11	26	1	22	3	26	29	14	3	46	195
04:15 PM	6	72	25	103	0	14	9	23	2	23	0	25	27	13	1	41	192
Total Volume	32	257	124	413	19	59	35	113	9	106	4	119	103	47	12	162	807
% App. Total	7.7	62.2	30		16.8	52.2	31		7.6	89.1	3.4		63.6	29	7.4		
PHF	.615	.868	.756	.875	.594	.776	.729	.831	.450	.736	.333	.726	.888	.839	.750	.880	.881

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0769
Counted: TO
Weather: Clear / Rainy

File Name : waipriA (cruise)
Site Code : 00000005
Start Date : 3/30/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Prison Street Westbound					Wainee Street Northbound					Prison Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
08:30 AM	1	11	13	0	25	4	25	19	0	48	7	10	0	0	17	11	13	8	0	32	122
08:45 AM	2	12	15	0	29	1	39	17	0	57	19	29	1	0	49	6	9	2	0	17	152
Total	3	23	28	0	54	5	64	36	0	105	26	39	1	0	66	17	22	10	0	49	274
09:00 AM	2	15	10	0	27	1	28	14	0	43	17	14	0	0	31	6	16	6	0	28	129
09:15 AM	1	14	13	0	28	5	23	4	0	32	8	21	1	0	30	12	22	6	0	40	130
09:30 AM	3	8	16	0	27	2	22	10	0	34	8	21	0	0	29	7	18	7	0	32	122
09:45 AM	2	16	14	0	32	1	21	12	0	34	22	23	0	0	45	12	21	6	0	39	150
Total	8	53	53	0	114	9	94	40	0	143	55	79	1	0	135	37	77	25	0	139	531
10:00 AM	4	18	14	0	36	13	27	5	0	45	22	17	2	0	41	16	22	7	0	45	167
10:15 AM	5	25	18	0	48	18	34	11	0	63	7	20	1	0	28	14	26	7	0	47	186
Grand Total	20	119	113	0	252	45	219	92	0	356	110	155	5	0	270	84	147	49	0	280	1158
Apprch %	7.9	47.2	44.8	0		12.6	61.5	25.8	0		40.7	57.4	1.9	0		30	52.5	17.5	0		
Total %	1.7	10.3	9.8	0	21.8	3.9	18.9	7.9	0	30.7	9.5	13.4	0.4	0	23.3	7.3	12.7	4.2	0	24.2	

	Wainee Street Southbound				Prison Street Westbound				Wainee Street Northbound				Prison Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:30 AM to 10:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 09:30 AM																	
09:30 AM	3	8	16	27	2	22	10	34	8	21	0	29	7	18	7	32	122
09:45 AM	2	16	14	32	1	21	12	34	22	23	0	45	12	21	6	39	150
10:00 AM	4	18	14	36	13	27	5	45	22	17	2	41	16	22	7	45	167
10:15 AM	5	25	18	48	18	34	11	63	7	20	1	28	14	26	7	47	186
Total Volume	14	67	62	143	34	104	38	176	59	81	3	143	49	87	27	163	625
% App. Total	9.8	46.9	43.4		19.3	59.1	21.6		41.3	56.6	2.1		30.1	53.4	16.6		
PHF	.700	.670	.861	.745	.472	.765	.792	.698	.670	.880	.375	.794	.766	.837	.964	.867	.840

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0769
Counted: TO
Weather: Clear / Rainy

File Name : waipriP
Site Code : 00000005
Start Date : 3/29/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Prison Street Westbound					Wainee Street Northbound					Prison Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	7	44	1	0	52	3	12	6	0	21	9	29	1	0	39	3	16	9	0	28	140
03:45 PM	4	63	1	0	68	5	12	5	0	22	17	45	1	0	63	11	14	4	0	29	182
Total	11	107	2	0	120	8	24	11	0	43	26	74	2	0	102	14	30	13	0	57	322
04:00 PM	5	73	5	0	83	1	13	12	0	26	11	35	0	0	46	13	19	12	0	44	199
04:15 PM	5	74	3	0	82	3	8	6	0	17	17	36	0	0	53	13	28	7	0	48	200
04:30 PM	7	56	9	0	72	4	27	5	0	36	16	35	1	0	52	10	16	5	0	31	191
04:45 PM	7	46	15	0	68	6	25	5	0	36	14	28	0	0	42	15	15	5	0	35	181
Total	24	249	32	0	305	14	73	28	0	115	58	134	1	0	193	51	78	29	0	158	771
05:00 PM	14	46	11	0	71	4	20	14	0	38	16	25	1	0	42	16	17	6	0	39	190
05:15 PM	10	26	5	0	41	6	16	7	0	29	15	19	0	0	34	7	21	0	0	28	132
Grand Total	59	428	50	0	537	32	133	60	0	225	115	252	4	0	371	88	146	48	0	282	1415
Apprch %	11	79.7	9.3	0		14.2	59.1	26.7	0		31	67.9	1.1	0		31.2	51.8	17	0		
Total %	4.2	30.2	3.5	0	38	2.3	9.4	4.2	0	15.9	8.1	17.8	0.3	0	26.2	6.2	10.3	3.4	0	19.9	

	Wainee Street Southbound				Prison Street Westbound				Wainee Street Northbound				Prison Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	4	63	1	68	5	12	5	22	17	45	1	63	11	14	4	29	182
04:00 PM	5	73	5	83	1	13	12	26	11	35	0	46	13	19	12	44	199
04:15 PM	5	74	3	82	3	8	6	17	17	36	0	53	13	28	7	48	200
04:30 PM	7	56	9	72	4	27	5	36	16	35	1	52	10	16	5	31	191
Total Volume	21	266	18	305	13	60	28	101	61	151	2	214	47	77	28	152	772
% App. Total	6.9	87.2	5.9		12.9	59.4	27.7		28.5	70.6	0.9		30.9	50.7	18.4		
PHF	.750	.899	.500	.919	.650	.556	.583	.701	.897	.839	.500	.849	.904	.688	.583	.792	.965

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Counter:D4-3889
Counted:GMT
Weather:Clear

File Name : WaiPriA
Site Code : 00000002
Start Date : 4/26/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					**Prison Street Westbound**					**Wainee Street Northbound**					**Prison Street Eastbound**					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	2	8	10	0	20	6	29	35	3	73	8	26	0	2	36	9	3	0	1	13	142
07:15 AM	1	14	8	1	24	8	40	15	2	65	8	33	0	0	41	14	1	6	2	23	153
07:30 AM	6	17	18	1	42	3	56	15	0	74	12	43	4	2	61	29	3	3	0	35	212
07:45 AM	3	25	13	0	41	8	51	17	2	78	14	39	0	1	54	22	2	5	0	29	202
Total	12	64	49	2	127	25	176	82	7	290	42	141	4	5	192	74	9	14	3	100	709
08:00 AM	2	18	10	0	30	18	27	20	2	67	9	39	0	2	50	18	3	3	1	25	172
08:15 AM	3	10	10	1	24	8	23	10	0	41	7	31	1	1	40	8	1	2	2	13	118
08:30 AM	1	11	6	2	20	3	32	16	0	51	14	27	0	2	43	7	1	2	1	11	125
08:45 AM	1	15	15	1	32	6	26	20	2	54	6	24	0	0	30	11	3	1	1	16	132
Total	7	54	41	4	106	35	108	66	4	213	36	121	1	5	163	44	8	8	5	65	547
Grand Total	19	118	90	6	233	60	284	148	11	503	78	262	5	10	355	118	17	22	8	165	1256
Apprch %	8.2	50.6	38.6	2.6		11.9	56.5	29.4	2.2		22	73.8	1.4	2.8		71.5	10.3	13.3	4.8		
Total %	1.5	9.4	7.2	0.5	18.6	4.8	22.6	11.8	0.9	40	6.2	20.9	0.4	0.8	28.3	9.4	1.4	1.8	0.6	13.1	

	Wainee Street Southbound					**Prison Street Westbound**					**Wainee Street Northbound**					**Prison Street Eastbound**					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	1	14	8	1	24	8	40	15	2	65	8	33	0	0	41	14	1	6	2	23	153
07:30 AM	6	17	18	1	42	3	56	15	0	74	12	43	4	2	61	29	3	3	0	35	212
07:45 AM	3	25	13	0	41	8	51	17	2	78	14	39	0	1	54	22	2	5	0	29	202
08:00 AM	2	18	10	0	30	18	27	20	2	67	9	39	0	2	50	18	3	3	1	25	172
Total Volume	12	74	49	2	137	37	174	67	6	284	43	154	4	5	206	83	9	17	3	112	739
% App. Total	8.8	54	35.8	1.5		13	61.3	23.6	2.1		20.9	74.8	1.9	2.4		74.1	8	15.2	2.7		
PHF	.500	.740	.681	.500	.815	.514	.777	.838	.750	.910	.768	.895	.250	.625	.844	.716	.750	.708	.375	.800	.871

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1- 0527 / D1- 0769
Counted: KT/ TO
Weather: Clear / Rainy

File Name : honpriA
Site Code : 00000007
Start Date : 3/31/2006
Page No : 1

Groups Printed- Unshifted

	Honoapiilani Hwy Southbound					Prison Street Westbound					Honoapiilani Hwy Northbound					Prison Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	114	10	0	124	0	0	0	0	0	19	243	0	0	262	0	0	2	0	2	388
07:15 AM	0	136	15	0	151	0	0	0	0	0	19	208	0	0	227	0	0	3	0	3	381
07:30 AM	0	130	15	0	145	0	0	0	0	0	13	248	0	0	261	0	1	4	0	5	411
07:45 AM	0	137	19	0	156	0	0	1	0	1	20	225	0	0	245	0	0	2	0	2	404
Total	0	517	59	0	576	0	0	1	0	1	71	924	0	0	995	0	1	11	0	12	1584
08:00 AM	0	113	9	0	122	0	0	0	0	0	11	171	1	0	183	0	0	4	0	4	309
08:15 AM	0	112	25	0	137	0	0	0	0	0	20	178	0	0	198	0	0	8	0	8	343
08:30 AM	0	135	12	0	147	1	0	0	0	1	20	191	0	0	211	0	0	4	0	4	363
08:45 AM	0	145	28	0	173	0	0	0	0	0	26	170	0	0	196	0	0	14	0	14	383
Total	0	505	74	0	579	1	0	0	0	1	77	710	1	0	788	0	0	30	0	30	1398
Grand Total	0	1022	133	0	1155	1	0	1	0	2	148	1634	1	0	1783	0	1	41	0	42	2982
Apprch %	0	88.5	11.5	0		50	0	50	0		8.3	91.6	0.1	0		0	2.4	97.6	0		
Total %	0	34.3	4.5	0	38.7	0	0	0	0	0.1	5	54.8	0	0	59.8	0	0	1.4	0	1.4	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM

	Honoapiilani Hwy Southbound				Prison Street Westbound				Honoapiilani Hwy Northbound				Prison Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	114	10	124	0	0	0	0	19	243	0	262	0	0	2	2	388
07:15 AM	0	136	15	151	0	0	0	0	19	208	0	227	0	0	3	3	381
07:30 AM	0	130	15	145	0	0	0	0	13	248	0	261	0	1	4	5	411
07:45 AM	0	137	19	156	0	0	1	1	20	225	0	245	0	0	2	2	404
Total Volume	0	517	59	576	0	0	1	1	71	924	0	995	0	1	11	12	1584
% App. Total	0	89.8	10.2		0	0	100		7.1	92.9	0		0	8.3	91.7		
PHF	.000	.943	.776	.923	.000	.000	.250	.250	.888	.931	.000	.949	.000	.250	.688	.600	.964

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0527 / D1-0769
Counted: KT/TO
Weather: Clear / Rainy

File Name : honpriP (cruise)
Site Code : 00000007
Start Date : 3/30/2006
Page No : 1

Groups Printed- Unshifted

	Honoapiilani Hwy Southbound					Prison Street Westbound					Honoapiilani Hwy Northbound					Prison Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	0	220	11	1	232	0	0	1	0	1	12	243	1	0	256	0	1	20	3	24	513
03:45 PM	0	225	16	0	241	0	0	1	0	1	17	227	0	1	245	0	1	25	0	26	513
Total	0	445	27	1	473	0	0	2	0	2	29	470	1	1	501	0	2	45	3	50	1026
04:00 PM	0	184	10	0	194	0	0	0	0	0	15	210	1	1	227	0	1	29	0	30	451
04:15 PM	0	185	14	0	199	0	0	0	1	1	15	212	2	0	229	0	6	29	0	35	464
04:30 PM	0	144	5	1	150	0	0	0	0	0	16	217	0	1	234	0	0	22	0	22	406
04:45 PM	0	180	3	0	183	0	0	0	0	0	12	225	2	0	239	0	0	24	0	24	446
Total	0	693	32	1	726	0	0	0	1	1	58	864	5	2	929	0	7	104	0	111	1767
05:00 PM	0	153	6	0	159	0	0	1	0	1	18	227	0	0	245	0	0	21	0	21	426
05:15 PM	0	143	1	0	144	0	0	0	0	0	13	231	1	0	245	0	0	10	0	10	399
Grand Total	0	1434	66	2	1502	0	0	3	1	4	118	1792	7	3	1920	0	9	180	3	192	3618
Apprch %	0	95.5	4.4	0.1		0	0	75	25		6.1	93.3	0.4	0.2		0	4.7	93.8	1.6		
Total %	0	39.6	1.8	0.1	41.5	0	0	0.1	0	0.1	3.3	49.5	0.2	0.1	53.1	0	0.2	5	0.1	5.3	

Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:30 PM

	Honoapiilani Hwy Southbound				Prison Street Westbound				Honoapiilani Hwy Northbound				Prison Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:30 PM	0	220	11	231	0	0	1	1	12	243	1	256	0	1	20	21	509
03:45 PM	0	225	16	241	0	0	1	1	17	227	0	244	0	1	25	26	512
04:00 PM	0	184	10	194	0	0	0	0	15	210	1	226	0	1	29	30	450
04:15 PM	0	185	14	199	0	0	0	0	15	212	2	229	0	6	29	35	463
Total Volume	0	814	51	865	0	0	2	2	59	892	4	955	0	9	103	112	1934
% App. Total	0	94.1	5.9		0	0	100		6.2	93.4	0.4		0	8	92		
PHF	.000	.904	.797	.897	.000	.000	.500	.500	.868	.918	.500	.933	.000	.375	.888	.800	.944

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D4-3888
Counted By: KT
Weather: Clear

File Name : frodicP(cruise)
Site Code : 00000001
Start Date : 3/9/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Dickenson Street Westbound					Front Street Northbound						
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
03:30 PM	18	64	0	42	124	16	0	5	119	140	0	77	10	0	87	0	351
03:45 PM	19	97	0	33	149	18	0	9	156	183	0	80	14	0	94	0	426
Total	37	161	0	75	273	34	0	14	275	323	0	157	24	0	181	0	777
04:00 PM	14	109	0	16	139	12	0	11	88	111	0	69	15	0	84	0	334
04:15 PM	11	87	0	24	122	12	0	14	87	113	0	70	10	0	80	0	315
04:30 PM	5	70	0	38	113	8	0	7	58	73	0	53	13	0	66	0	252
04:45 PM	13	66	0	15	94	16	0	13	25	54	0	60	12	0	72	0	220
Total	43	332	0	93	468	48	0	45	258	351	0	252	50	0	302	0	1121
05:00 PM	16	58	0	27	101	11	0	6	47	64	0	58	11	0	69	0	234
05:15 PM	10	76	0	14	100	5	0	9	45	59	0	59	9	0	68	0	227
Grand Total	106	627	0	209	942	98	0	74	625	797	0	526	94	0	620	0	2359
Apprch %	11.3	66.6	0.0	22.2		12.3	0.0	9.3	78.4		0.0	84.8	15.2	0.0			
Total %	4.5	26.6	0.0	8.9	39.9	4.2	0.0	3.1	26.5	33.8	0.0	22.3	4.0	0.0	26.3	0.0	

	Front Street Southbound				Dickenson Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1														
Intersection	03:30 PM													
Volume	62	357	0	419	58	0	39	97	0	296	49	345	0	861
Percent	14.8	85.2	0.0		59.8	0.0	40.2		0.0	85.8	14.2			
03:45 Volume	19	97	0	116	18	0	9	27	0	80	14	94	0	237
Peak Factor														0.908
High Int.	04:00 PM				03:45 PM				03:45 PM				3:15:00 PM	
Volume	14	109	0	123	18	0	9	27	0	80	14	94		
Peak Factor				0.852				0.898				0.918		

Wilson Okamoto Corporation
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Counter: D4-3888
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Weather: Clear

File Name : frodicA(cruise)
Site Code : 00000001
Start Date : 3/9/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Dickenson Street Westbound					Front Street Northbound						
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
08:30 AM	4	49	0	7	60	10	0	6	15	31	0	26	7	0	33	0	124
08:45 AM	13	65	0	16	94	17	0	7	28	52	0	31	8	0	39	0	185
Total	17	114	0	23	154	27	0	13	43	83	0	57	15	0	72	0	309
09:00 AM	9	65	0	24	98	11	0	10	12	33	0	46	16	0	62	0	193
09:15 AM	4	57	0	20	81	10	0	10	35	55	0	48	10	0	58	0	194
09:30 AM	17	78	0	17	112	11	0	8	32	51	0	52	7	0	59	0	222
09:45 AM	14	61	0	20	95	11	0	9	36	56	0	58	11	0	69	0	220
Total	44	261	0	81	386	43	0	37	115	195	0	204	44	0	248	0	829
10:00 AM	9	72	0	18	99	12	0	10	63	85	0	47	21	0	68	0	252
10:15 AM	16	63	0	6	85	10	0	6	87	103	0	54	16	0	70	0	258
Grand Total	86	510	0	128	724	92	0	66	308	466	0	362	96	0	458	0	1648
Apprch %	11.9	70.4	0.0	17.7		19.7	0.0	14.2	66.1		0.0	79.0	21.0	0.0			
Total %	5.2	30.9	0.0	7.8	43.9	5.6	0.0	4.0	18.7	28.3	0.0	22.0	5.8	0.0	27.8	0.0	

	Front Street Southbound				Dickenson Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 08:30 AM to 10:15 AM - Peak 1 of 1														
Intersection	09:30 AM													
Volume	56	274	0	330	44	0	33	77	0	211	55	266	0	673
Percent	17.0	83.0	0.0		57.1	0.0	42.9		0.0	79.3	20.7			
09:30 Volume	17	78	0	95	11	0	8	19	0	52	7	59	0	173
Peak Factor														0.973
High Int.	09:30 AM				10:00 AM				10:15 AM				8:15:00 AM	
Volume	17	78	0	95	12	0	10	22	0	54	16	70		
Peak Factor				0.868				0.875				0.950		

Wilson Okamoto Corporation
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Counter: D4-3888
Counted By: KT
Weather: Clear

File Name : frodicP
Site Code : 00000001
Start Date : 3/8/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Dickenson Street Westbound					Front Street Northbound						
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
03:30 PM	13	92	0	32	137	15	0	8	52	75	0	64	12	0	76	0	288
03:45 PM	19	79	0	68	166	11	0	16	55	82	0	63	21	0	84	0	332
Total	32	171	0	100	303	26	0	24	107	157	0	127	33	0	160	0	620
04:00 PM	22	106	0	39	167	17	0	14	56	87	0	89	9	0	98	0	352
04:15 PM	26	84	0	43	153	15	0	7	60	82	0	76	15	0	91	0	326
04:30 PM	8	110	0	42	160	13	0	11	57	81	0	57	14	0	71	0	312
04:45 PM	17	56	0	36	109	16	0	11	63	90	0	67	11	0	78	0	277
Total	73	356	0	160	589	61	0	43	236	340	0	289	49	0	338	0	1267
05:00 PM	17	31	0	21	69	10	0	4	35	49	0	34	7	0	41	0	159
05:15 PM	9	64	0	27	100	8	0	8	58	74	0	64	6	0	70	0	244
Grand Total	131	622	0	308	1061	105	0	79	436	620	0	514	95	0	609	0	2290
Apprch %	12.3	58.6	0.0	29.0		16.9	0.0	12.7	70.3		0.0	84.4	15.6	0.0			
Total %	5.7	27.2	0.0	13.4	46.3	4.6	0.0	3.4	19.0	27.1	0.0	22.4	4.1	0.0	26.6	0.0	

	Front Street Southbound				Dickenson Street Westbound				Front Street Northbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 03:30 PM to 05:15 PM - Peak 1 of 1														
Intersection	03:45 PM													
Volume	75	379	0	454	56	0	48	104	0	285	59	344	0	902
Percent	16.5	83.5	0.0		53.8	0.0	46.2		0.0	82.8	17.2			
04:00 Volume	22	106	0	128	17	0	14	31	0	89	9	98	0	257
Peak Factor														0.877
High Int.	04:00 PM				04:00 PM				04:00 PM				3:15:00 PM	
Volume	22	106	0	128	17	0	14	31	0	89	9	98		
Peak Factor				0.887				0.839				0.878		

WILSON OKAMOTO CORPORATION
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Counter: D1-0528
Counted: TO
Weather: CLEAR

File Name : frodicA
Site Code : 00000004
Start Date : 4/19/2006
Page No : 1

Groups Printed- Unshifted

	Front Street Southbound					Dickenson Street Westbound					Front Street Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	47	0	0	50	6	0	2	33	41	0	26	9	0	35	0	0	0	0	0	126
07:15 AM	3	88	0	0	91	9	0	8	44	61	0	84	12	0	96	0	0	0	0	0	248
07:30 AM	3	71	0	0	74	7	0	13	29	49	0	83	9	0	92	0	0	0	0	0	215
07:45 AM	11	42	0	0	53	4	0	10	49	63	0	80	6	0	86	0	0	0	0	0	202
Total	20	248	0	0	268	26	0	33	155	214	0	273	36	0	309	0	0	0	0	0	791
08:00 AM	4	28	0	0	32	9	0	6	37	52	0	48	7	0	55	0	0	0	0	0	139
08:15 AM	11	39	0	0	50	15	0	7	50	72	0	50	8	0	58	0	0	0	0	0	180
08:30 AM	6	42	0	0	48	11	0	7	57	75	0	28	5	0	33	0	0	0	0	0	156
08:45 AM	9	57	0	0	66	9	0	5	67	81	0	51	13	0	64	0	0	0	0	0	211
Total	30	166	0	0	196	44	0	25	211	280	0	177	33	0	210	0	0	0	0	0	686
Grand Total	50	414	0	0	464	70	0	58	366	494	0	450	69	0	519	0	0	0	0	0	1477
Apprch %	10.8	89.2	0	0		14.2	0	11.7	74.1		0	86.7	13.3	0		0	0	0	0		
Total %	3.4	28	0	0	31.4	4.7	0	3.9	24.8	33.4	0	30.5	4.7	0	35.1	0	0	0	0	0	

	Front Street Southbound				Dickenson Street Westbound				Front Street Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	88	0	91	9	0	8	17	0	84	12	96	0	0	0	0	204
07:30 AM	3	71	0	74	7	0	13	20	0	83	9	92	0	0	0	0	186
07:45 AM	11	42	0	53	4	0	10	14	0	80	6	86	0	0	0	0	153
08:00 AM	4	28	0	32	9	0	6	15	0	48	7	55	0	0	0	0	102
Total Volume	21	229	0	250	29	0	37	66	0	295	34	329	0	0	0	0	645
% App. Total	8.4	91.6	0		43.9	0	56.1		0	89.7	10.3		0	0	0		
PHF	.477	.651	.000	.687	.806	.000	.712	.825	.000	.878	.708	.857	.000	.000	.000	.000	.790

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
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Counter: D1-0527
Counted: KT
Weather: SUNNY

File Name : waidicP (cruise)
Site Code : 00000005
Start Date : 4/18/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Dickenson Street Westbound					Wainee Street Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	6	60	12	0	78	24	12	0	3	39	5	57	10	1	73	14	18	3	3	38	228
03:45 PM	5	75	12	2	94	44	22	3	2	71	3	67	4	2	76	17	19	13	4	53	294
Total	11	135	24	2	172	68	34	3	5	110	8	124	14	3	149	31	37	16	7	91	522
04:00 PM	3	59	15	0	77	35	24	1	0	60	4	60	13	0	77	11	20	5	1	37	251
04:15 PM	4	60	14	0	78	37	25	3	1	66	3	50	17	0	70	20	20	7	1	48	262
04:30 PM	4	50	16	0	70	45	17	6	0	68	5	38	17	0	60	11	19	7	2	39	237
04:45 PM	4	46	10	0	60	30	20	3	0	53	5	46	6	2	59	11	11	8	2	32	204
Total	15	215	55	0	285	147	86	13	1	247	17	194	53	2	266	53	70	27	6	156	954
05:00 PM	2	69	19	3	93	13	21	5	4	43	4	50	13	1	68	18	11	4	4	37	241
05:15 PM	4	57	8	0	69	8	23	3	1	35	2	42	12	4	60	12	18	5	8	43	207
Grand Total	32	476	106	5	619	236	164	24	11	435	31	410	92	10	543	114	136	52	25	327	1924
Apprch %	5.2	76.9	17.1	0.8		54.3	37.7	5.5	2.5		5.7	75.5	16.9	1.8		34.9	41.6	15.9	7.6		
Total %	1.7	24.7	5.5	0.3	32.2	12.3	8.5	1.2	0.6	22.6	1.6	21.3	4.8	0.5	28.2	5.9	7.1	2.7	1.3	17	

	Wainee Street Southbound				Dickenson Street Westbound				Wainee Street Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	5	75	12	92	44	22	3	69	3	67	4	74	17	19	13	49	284
04:00 PM	3	59	15	77	35	24	1	60	4	60	13	77	11	20	5	36	250
04:15 PM	4	60	14	78	37	25	3	65	3	50	17	70	20	20	7	47	260
04:30 PM	4	50	16	70	45	17	6	68	5	38	17	60	11	19	7	37	235
Total Volume	16	244	57	317	161	88	13	262	15	215	51	281	59	78	32	169	1029
% App. Total	5	77	18		61.5	33.6	5		5.3	76.5	18.1		34.9	46.2	18.9		
PHF	.800	.813	.891	.861	.894	.880	.542	.949	.750	.802	.750	.912	.738	.975	.615	.862	.906

WILSON OKAMOTO CORPORATION
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Honolulu, HI 96826

Counter: D1-0528 / D1-0768
Counted: IW / GMT
Weather: Clear / Rainy

File Name : waidicA (cruise)
Site Code : 00000004
Start Date : 3/30/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Dickenson Street Westbound					Wainee Street Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
08:30 AM	0	27	11	0	38	8	11	2	1	22	1	33	7	6	47	8	11	2	6	27	134
08:45 AM	2	28	11	0	41	11	24	4	0	39	12	31	4	1	48	13	7	6	1	27	155
Total	2	55	22	0	79	19	35	6	1	61	13	64	11	7	95	21	18	8	7	54	289
09:00 AM	2	30	15	12	59	11	28	2	4	45	5	25	6	3	39	7	13	4	13	37	180
09:15 AM	1	24	5	0	30	18	27	3	0	48	5	38	2	2	47	13	10	5	4	32	157
09:30 AM	2	25	12	0	39	1	26	6	0	33	6	34	8	1	49	12	18	4	1	35	156
09:45 AM	3	37	17	0	57	10	17	9	0	36	1	45	4	0	50	9	10	2	3	24	167
Total	8	116	49	12	185	40	98	20	4	162	17	142	20	6	185	41	51	15	21	128	660
10:00 AM	1	26	13	1	41	9	14	5	3	31	4	38	5	9	56	7	19	6	2	34	162
10:15 AM	2	28	6	0	36	28	13	6	0	47	4	30	4	0	38	10	8	10	0	28	149
Grand Total	13	225	90	13	341	96	160	37	8	301	38	274	40	22	374	79	96	39	30	244	1260
Apprch %	3.8	66	26.4	3.8		31.9	53.2	12.3	2.7		10.2	73.3	10.7	5.9		32.4	39.3	16	12.3		
Total %	1	17.9	7.1	1	27.1	7.6	12.7	2.9	0.6	23.9	3	21.7	3.2	1.7	29.7	6.3	7.6	3.1	2.4	19.4	

	Wainee Street Southbound				Dickenson Street Westbound				Wainee Street Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:30 AM to 10:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 09:00 AM																	
09:00 AM	2	30	15	47	11	28	2	41	5	25	6	36	7	13	4	24	148
09:15 AM	1	24	5	30	18	27	3	48	5	38	2	45	13	10	5	28	151
09:30 AM	2	25	12	39	1	26	6	33	6	34	8	48	12	18	4	34	154
09:45 AM	3	37	17	57	10	17	9	36	1	45	4	50	9	10	2	21	164
Total Volume	8	116	49	173	40	98	20	158	17	142	20	179	41	51	15	107	617
% App. Total	4.6	67.1	28.3		25.3	62	12.7		9.5	79.3	11.2		38.3	47.7	14		
PHF	.667	.784	.721	.759	.556	.875	.556	.823	.708	.789	.625	.895	.788	.708	.750	.787	.941

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0528 / D1-0768
Counted: IW / GMT
Weather: Clear / Rainy

File Name : waidicP
Site Code : 00000004
Start Date : 3/29/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Dickenson Street Westbound					Wainee Street Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	7	66	25	0	98	21	23	2	0	46	6	64	11	2	83	9	15	8	0	32	259
03:45 PM	3	56	21	0	80	25	20	5	0	50	6	64	10	0	80	21	20	5	1	47	257
Total	10	122	46	0	178	46	43	7	0	96	12	128	21	2	163	30	35	13	1	79	516
04:00 PM	9	63	23	1	96	26	23	6	1	56	5	61	10	2	78	16	18	2	0	36	266
04:15 PM	2	65	12	0	79	28	15	7	0	50	7	47	7	2	63	17	21	4	2	44	236
04:30 PM	5	61	15	0	81	19	23	3	0	45	10	46	8	2	66	18	22	7	4	51	243
04:45 PM	4	58	13	0	75	13	17	6	2	38	6	69	10	1	86	11	24	9	2	46	245
Total	20	247	63	1	331	86	78	22	3	189	28	223	35	7	293	62	85	22	8	177	990
05:00 PM	4	58	16	0	78	11	28	4	0	43	7	58	13	13	91	15	20	5	4	44	256
05:15 PM	6	38	15	0	59	6	20	1	0	27	5	36	8	3	52	13	17	3	2	35	173
Grand Total	40	465	140	1	646	149	169	34	3	355	52	445	77	25	599	120	157	43	15	335	1935
Apprch %	6.2	72	21.7	0.2		42	47.6	9.6	0.8		8.7	74.3	12.9	4.2		35.8	46.9	12.8	4.5		
Total %	2.1	24	7.2	0.1	33.4	7.7	8.7	1.8	0.2	18.3	2.7	23	4	1.3	31	6.2	8.1	2.2	0.8	17.3	

	Wainee Street Southbound				Dickenson Street Westbound				Wainee Street Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	7	66	25	98	21	23	2	46	6	64	11	81	9	15	8	32	257
03:45 PM	3	56	21	80	25	20	5	50	6	64	10	80	21	20	5	46	256
04:00 PM	9	63	23	95	26	23	6	55	5	61	10	76	16	18	2	36	262
04:15 PM	2	65	12	79	28	15	7	50	7	47	7	61	17	21	4	42	232
Total Volume	21	250	81	352	100	81	20	201	24	236	38	298	63	74	19	156	1007
% App. Total	6	71	23		49.8	40.3	10		8.1	79.2	12.8		40.4	47.4	12.2		
PHF	.583	.947	.810	.898	.893	.880	.714	.914	.857	.922	.864	.920	.750	.881	.594	.848	.961

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0527
Counted: KT
Weather: SUNNY

File Name : waidicA
Site Code : 00000005
Start Date : 4/19/2006
Page No : 1

Groups Printed- Unshifted

	Wainee Street Southbound					Dickenson Street Westbound					Wainee Street Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	2	23	4	0	29	8	12	0	0	20	2	29	12	1	44	2	9	3	3	17	110
07:15 AM	2	21	5	0	28	10	9	1	2	22	3	36	9	1	49	0	9	2	1	12	111
07:30 AM	3	28	8	0	39	9	11	0	3	23	1	40	23	1	65	6	14	2	2	24	151
07:45 AM	3	21	6	0	30	11	6	1	1	19	5	37	3	0	45	12	11	4	0	27	121
Total	10	93	23	0	126	38	38	2	6	84	11	142	47	3	203	20	43	11	6	80	493
08:00 AM	1	12	5	0	18	7	12	1	0	20	1	33	10	3	47	5	7	4	2	18	103
08:15 AM	0	13	6	0	19	11	15	0	0	26	5	32	4	0	41	7	3	7	1	18	104
08:30 AM	1	16	10	2	29	8	22	3	2	35	5	30	5	1	41	5	2	5	4	16	121
08:45 AM	3	16	9	0	28	12	16	1	1	30	2	38	3	1	44	7	11	6	3	27	129
Total	5	57	30	2	94	38	65	5	3	111	13	133	22	5	173	24	23	22	10	79	457
Grand Total	15	150	53	2	220	76	103	7	9	195	24	275	69	8	376	44	66	33	16	159	950
Apprch %	6.8	68.2	24.1	0.9		39	52.8	3.6	4.6		6.4	73.1	18.4	2.1		27.7	41.5	20.8	10.1		
Total %	1.6	15.8	5.6	0.2	23.2	8	10.8	0.7	0.9	20.5	2.5	28.9	7.3	0.8	39.6	4.6	6.9	3.5	1.7	16.7	

	Wainee Street Southbound				Dickenson Street Westbound				Wainee Street Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	23	4	29	8	12	0	20	2	29	12	43	2	9	3	14	106
07:15 AM	2	21	5	28	10	9	1	20	3	36	9	48	0	9	2	11	107
07:30 AM	3	28	8	39	9	11	0	20	1	40	23	64	6	14	2	22	145
07:45 AM	3	21	6	30	11	6	1	18	5	37	3	45	12	11	4	27	120
Total Volume	10	93	23	126	38	38	2	78	11	142	47	200	20	43	11	74	478
% App. Total	7.9	73.8	18.3		48.7	48.7	2.6		5.5	71	23.5		27	58.1	14.9		
PHF	.833	.830	.719	.808	.864	.792	.500	.975	.550	.888	.511	.781	.417	.768	.688	.685	.824

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0528 / D1-0768
Counted: IW / GMT
Weather: Clear / Rainy

File Name : hondicA
Site Code : 00000006
Start Date : 3/31/2006
Page No : 1

Groups Printed- Unshifted

	Honoapiilani Hwy Southbound					Dickenson Street Westbound					Honoapiilani Hwy Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	4	118	21	1	144	6	5	6	0	17	3	227	7	0	237	3	7	0	1	11	409
07:15 AM	2	132	46	4	184	7	3	10	0	20	3	209	9	0	221	10	7	4	0	21	446
07:30 AM	4	133	39	6	182	6	8	12	0	26	4	211	19	0	234	17	10	5	0	32	474
07:45 AM	3	139	18	0	160	8	3	9	0	20	7	207	16	0	230	10	4	2	0	16	426
Total	13	522	124	11	670	27	19	37	0	83	17	854	51	0	922	40	28	11	1	80	1755
08:00 AM	2	121	13	1	137	5	3	8	0	16	6	152	16	0	174	4	3	5	0	12	339
08:15 AM	5	123	16	1	145	7	1	6	0	14	5	163	6	0	174	10	1	0	0	11	344
08:30 AM	2	149	16	2	169	4	4	7	1	16	11	163	8	0	182	4	7	5	0	16	383
08:45 AM	1	169	33	0	203	6	3	5	0	14	12	141	7	0	160	8	5	6	0	19	396
Total	10	562	78	4	654	22	11	26	1	60	34	619	37	0	690	26	16	16	0	58	1462
Grand Total	23	1084	202	15	1324	49	30	63	1	143	51	1473	88	0	1612	66	44	27	1	138	3217
Apprch %	1.7	81.9	15.3	1.1		34.3	21	44.1	0.7		3.2	91.4	5.5	0		47.8	31.9	19.6	0.7		
Total %	0.7	33.7	6.3	0.5	41.2	1.5	0.9	2	0	4.4	1.6	45.8	2.7	0	50.1	2.1	1.4	0.8	0	4.3	

	Honoapiilani Hwy Southbound				Dickenson Street Westbound				Honoapiilani Hwy Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	4	118	21	143	6	5	6	17	3	227	7	237	3	7	0	10	407
07:15 AM	2	132	46	180	7	3	10	20	3	209	9	221	10	7	4	21	442
07:30 AM	4	133	39	176	6	8	12	26	4	211	19	234	17	10	5	32	468
07:45 AM	3	139	18	160	8	3	9	20	7	207	16	230	10	4	2	16	426
Total Volume	13	522	124	659	27	19	37	83	17	854	51	922	40	28	11	79	1743
% App. Total	2	79.2	18.8		32.5	22.9	44.6		1.8	92.6	5.5		50.6	35.4	13.9		
PHF	.813	.939	.674	.915	.844	.594	.771	.798	.607	.941	.671	.973	.588	.700	.550	.617	.931

WILSON OKAMOTO CORPORATION
1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0528 / D1-0768
Counted: IW/ GMT
Weather: Clear / Rainy

File Name : hondicP (cruise)
Site Code : 00000006
Start Date : 3/30/2006
Page No : 1

Groups Printed- Unshifted

	Honoapiilani Hwy Southbound					Dickenson Street Westbound					Honoapiilani Hwy Northbound					Dickenson Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	3	231	52	2	288	13	6	4	0	23	5	220	18	0	243	18	10	8	0	36	590
03:45 PM	2	216	46	2	266	11	6	8	0	25	7	218	16	0	241	13	7	6	0	26	558
Total	5	447	98	4	554	24	12	12	0	48	12	438	34	0	484	31	17	14	0	62	1148
04:00 PM	2	173	49	3	227	6	9	8	0	23	9	189	16	0	214	27	12	12	2	53	517
04:15 PM	4	196	38	1	239	4	0	6	0	10	7	213	7	1	228	1	2	1	1	5	482
04:30 PM	3	123	13	1	140	6	2	3	0	11	17	190	13	0	220	14	18	18	0	50	421
04:45 PM	5	194	14	1	214	8	4	7	0	19	7	196	14	0	217	20	11	12	0	43	493
Total	14	686	114	6	820	24	15	24	0	63	40	788	50	1	879	62	43	43	3	151	1913
05:00 PM	3	171	13	0	187	7	4	1	0	12	12	205	15	0	232	16	15	6	0	37	468
05:15 PM	1	136	14	2	153	5	6	5	0	16	7	213	16	0	236	7	8	3	0	18	423
Grand Total	23	1440	239	12	1714	60	37	42	0	139	71	1644	115	1	1831	116	83	66	3	268	3952
Apprch %	1.3	84	13.9	0.7		43.2	26.6	30.2	0		3.9	89.8	6.3	0.1		43.3	31	24.6	1.1		
Total %	0.6	36.4	6	0.3	43.4	1.5	0.9	1.1	0	3.5	1.8	41.6	2.9	0	46.3	2.9	2.1	1.7	0.1	6.8	

	Honoapiilani Hwy Southbound				Dickenson Street Westbound				Honoapiilani Hwy Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	3	231	52	286	13	6	4	23	5	220	18	243	18	10	8	36	588
03:45 PM	2	216	46	264	11	6	8	25	7	218	16	241	13	7	6	26	556
04:00 PM	2	173	49	224	6	9	8	23	9	189	16	214	27	12	12	51	512
04:15 PM	4	196	38	238	4	0	6	10	7	213	7	227	1	2	1	4	479
Total Volume	11	816	185	1012	34	21	26	81	28	840	57	925	59	31	27	117	2135
% App. Total	1.1	80.6	18.3		42	25.9	32.1		3	90.8	6.2		50.4	26.5	23.1		
PHF	.688	.883	.889	.885	.654	.583	.813	.810	.778	.955	.792	.952	.546	.646	.563	.574	.908

Wilson Okamoto Corporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Site: 02
Date: 04/18/06

·le1 : Hotel Street
Title2 : Lahaina Small Boat Harbor
Title3 :

Day: Tuesday

Interval Begin	AM - WB		PM - WB	
00	.	.	.	.
15	.		.	
12:30	.		.	
12:45	.		.	
00	.	.	.	.
15	.		.	
1:30	.		.	
1:45	.		.	
00	.	.	.	.
15	.		.	
2:30	.		16	
2:45	.		52	
00	.	.	38	155
15	.		42	
3:30	.		40	
3:45	.		35	
00	.	.	61	197
15	.		36	
4:30	.		62	
4:45	.		38	
00	.	.	38	132
15	.		38	
5:30	.		28	
5:45	.		28	
00	.	.	30	118
15	.		32	
6:30	.		24	
6:45	.		32	
00	.	.	36	124
15	.		22	
30	.		30	
7:45	.		36	
8:00	.	.	11	72
15	.		23	
30	.		16	
8:45	.		22	
9:00	.	.	21	81
15	.		18	
30	.		24	
9:45	.		18	
10:00	.	.	19	62
10:15	.		16	
10:30	.		15	
10:45	.		12	
11:00	.	.	8	29
11:15	.		10	
11:30	.		6	
11:45	.		5	
Totals	0		1,038	
Peak Hour	.		4:00	
Volume	.		197	
Factor	.		0.79	
DayTotal	1,038			

WILSON OKAMOTO CORPORATION

1907 S. Beretania Street, Suite 400
Honolulu, HI 96826

Counter: D1-0527 / D1-0528
Counted: KT / TO
Weather: CLEAR

File Name : hondicP
Site Code : 00000007
Start Date : 4/19/2006
Page No : 1

Groups Printed- Unshifted

	Honoapiilani Hwy Southbound				Dickenson Street Westbound				Honoapiilani Hwy Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:30 PM	4	208	33	245	19	12	5	36	8	212	20	240	16	5	8	29	550
03:45 PM	3	231	30	264	9	8	7	24	4	210	25	239	12	12	8	32	559
Total	7	439	63	509	28	20	12	60	12	422	45	479	28	17	16	61	1109
04:00 PM	6	190	25	221	10	11	2	23	7	193	20	220	9	11	8	28	492
04:15 PM	2	192	11	205	13	11	3	27	5	206	15	226	20	16	9	45	503
04:30 PM	2	91	17	110	9	10	1	20	5	187	11	203	10	11	10	31	364
04:45 PM	1	156	6	163	1	6	5	12	7	223	18	248	10	8	4	22	445
Total	11	629	59	699	33	38	11	82	24	809	64	897	49	46	31	126	1804
05:00 PM	2	158	15	175	1	12	4	17	7	200	18	225	17	18	6	41	458
05:15 PM	0	51	9	60	6	9	0	15	9	225	9	243	6	12	13	31	349
Grand Total	20	1277	146	1443	68	79	27	174	52	1656	136	1844	100	93	66	259	3720
Apprch %	1.4	88.5	10.1		39.1	45.4	15.5		2.8	89.8	7.4		38.6	35.9	25.5		
Total %	0.5	34.3	3.9	38.8	1.8	2.1	0.7	4.7	1.4	44.5	3.7	49.6	2.7	2.5	1.8	7	

	Honoapiilani Hwy Southbound				Dickenson Street Westbound				Honoapiilani Hwy Northbound				Dickenson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	4	208	33	245	19	12	5	36	8	212	20	240	16	5	8	29	550
03:45 PM	3	231	30	264	9	8	7	24	4	210	25	239	12	12	8	32	559
04:00 PM	6	190	25	221	10	11	2	23	7	193	20	220	9	11	8	28	492
04:15 PM	2	192	11	205	13	11	3	27	5	206	15	226	20	16	9	45	503
Total Volume	15	821	99	935	51	42	17	110	24	821	80	925	57	44	33	134	2104
% App. Total	1.6	87.8	10.6		46.4	38.2	15.5		2.6	88.8	8.6		42.5	32.8	24.6		
PHF	.625	.889	.750	.885	.671	.875	.607	.764	.750	.968	.800	.964	.713	.688	.917	.744	.941

Wilson Okamoto Corporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Title1	: Hotel Street	Site:	02
Title2	: Lahaina Small Boat Harbor	Date:	04/19/06
Title3	:		

Interval Begin	AM - WB		PM - WB	
1 :0	8	17	48	177
1 15	2		43	
12:30	6		44	
12:45	1		42	
:0	4	10	46	166
5	0		40	
1:30	4		44	
1:45	2		36	
:0	4	8	35	184
5	1		44	
2:30	2		53	
2:45	1		52	
:0	2	11	40	168
15	1		52	
3:30	2		30	
3:45	6		46	
:0	6	18	46	154
15	3		48	
4:30	6		28	
4:45	3		32	
:0	6	38	*	*
15	4		*	
5:30	7		*	
5:45	21		*	
00	29	105	*	*
15	24		*	
.30	20		*	
6:45	32		*	
00	39	158	*	*
15	53		*	
.30	46		*	
7:45	20		*	
:00	26	137	*	*
15	30		*	
.30	33		*	
8:45	48		*	
:00	32	148	*	*
15	25		*	
30	37		*	
9:45	54		*	
10:00	44	160	*	*
:15	29		*	
:30	47		*	
10:45	40		*	
11:00	50	194	*	*
:15	44		*	
:30	57		*	
11:45	43		*	
Totals	1,004		849	

Day: Wednesday

Peak Hour	11:00	2:30
Volume	194	197
Factor	0.85	0.93

DayTotal 1,853

Wilson Okamoto Coporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Title1	: Canal Street	Site:	100000000000
Title2	: Lahaina Small Boat Harbor	Date:	03/08/06
Title3	:	Day:	Wednesday

Interval Begin	EBL AM	EBL PM		EBR AM	EBR PM		Combined AM	Combined PM	
12:00	*	*		*	*		*	*	
12:15	*	*		*	*		*	*	
12:30	*	*		*	*		*	*	
12:45	*	*		*	*		*	*	
01:00	*	*		*	*		*	*	
01:15	*	*		*	*		*	*	
01:30	*	*		*	*		*	*	
01:45	*	*		*	*		*	*	
02:00	*	*		*	*		*	*	
02:15	*	*		*	*		*	*	
02:30	*	*		*	*		*	*	
02:45	*	*		*	*		*	*	
03:00	*	*		*	*		*	*	
03:15	*	20		*	22		*	42	
03:30	*	32		*	24		*	56	
03:45	*	19		*	28		*	47	
04:00	*	27	105	*	32	109	*	59	214
04:15	*	28		*	32		*	60	
04:30	*	26		*	27		*	53	
04:45	*	24		*	18		*	42	
05:00	*	16	64	*	18	89	*	34	153
05:15	*	16		*	23		*	39	
05:30	*	14		*	39		*	53	
05:45	*	18		*	9		*	27	
06:00	*	27	74	*	20	60	*	47	134
06:15	*	19		*	22		*	41	
06:30	*	16		*	14		*	30	
06:45	*	12		*	4		*	16	
07:00	*	26	72	*	14	50	*	40	122
07:15	*	16		*	4		*	20	
07:30	*	14		*	12		*	26	
07:45	*	16		*	20		*	36	
08:00	*	8	54	*	12	46	*	20	100
08:15	*	18		*	8		*	26	
08:30	*	14		*	14		*	28	
08:45	*	14		*	12		*	26	
09:00	*	12	42	*	11	38	*	23	80
09:15	*	9		*	15		*	24	
09:30	*	7		*	12		*	19	
09:45	*	14		*	0		*	14	
10:00	*	9	30	*	6	16	*	15	46
10:15	*	8		*	2		*	10	
10:30	*	7		*	8		*	15	
10:45	*	6		*	0		*	6	
11:00	*	6	16	*	4		*	10	
11:15	*	4		*	0		*	4	
11:30	*	4		*	*		*	*	
11:45	*	2		*	0		*	2	
Totals	0	528		0	486		0	1,010	
Split%	*	52.3		*	48.1				
Day Totals	528			486			1,010		
Day Splits	52.3			48.1					
Peak Hour	*	03:30		*	03:45		*	03:30	
Volume	*	106		*	119		*	222	
Factor	*	0.83		*	0.93		*	0.93	

Data File : Canal Street

Wilson Okamoto Coporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Canal Street
Title2 : Lahaina Small Boat Harbor
Title3 :

Site: 100000000000
Date: 03/09/06
Day: Thursday

Interval	EBL AM		EBL PM		EBR AM		EBR PM		Combined AM		Combined PM	
Begin	AM		PM		AM		PM		AM		PM	
12:00	2	4	36	137	0	0	31	91	2	4	67	228
12:15	2		36		0		20		2		56	
12:30	0		30		0		28		0		58	
12:45	0		35		0		12		0		47	
01:00	1	6	23	114	0	4	16	115	1	10	39	229
01:15	3		34		0		28		3		62	
01:30	2		33		0		33		2		66	
01:45	0		24		4		38		4		62	
02:00	2	2	30	126	0	2	34	121	2	4	64	247
02:15	0		20		0		39		0		59	
02:30	0		38		2		32		2		70	
02:45	0		38		0		16		0		54	
03:00	2	5	30	148	*		24	118	*		54	266
03:15	2		32		2		24		4		56	
03:30	1		44		0		36		1		80	
03:45	0		42		0		34		0		76	
04:00	1	14	23	127	2	15	36	148	3	29	59	275
04:15	6		28		3		38		9		66	
04:30	3		36		8		57		11		93	
04:45	4		40		2		17		6		57	
05:00	4	23	25		0	2	26		4	25	51	
05:15	3		30		2		25		5		55	
05:30	8		0		0		0		8		0	
05:45	8		*		0		*		8		*	
06:00	10	64	*		4	22	*		14	86	*	
06:15	16		*		5		*		21		*	
06:30	18		*		6		*		24		*	
06:45	20		*		7		*		27		*	
07:00	18	146	*		12	95	*		30	241	*	
07:15	54		*		29		*		83		*	
07:30	46		*		32		*		78		*	
07:45	28		*		22		*		50		*	
08:00	32	176	*		12	70	*		44	246	*	
08:15	50		*		10		*		60		*	
08:30	52		*		26		*		78		*	
08:45	42		*		22		*		64		*	
09:00	69	205	*		18	74	*		87	279	*	
09:15	42		*		20		*		62		*	
09:30	42		*		18		*		60		*	
09:45	52		*		18		*		70		*	
10:00	61	204	*		16	88	*		77	292	*	
10:15	46		*		24		*		70		*	
10:30	67		*		20		*		87		*	
10:45	30		*		28		*		58		*	
11:00	56	175	*		32	129	*		88	304	*	
11:15	37		*		40		*		77		*	
11:30	42		*		38		*		80		*	
11:45	40		*		19		*		59		*	
Totals	1,024		707		503		644		1,525		1,351	
Split%	67.1		52.3		33.0		47.7					
Day Totals		1,731				1,147				2,876		
Day Splits		60.2				39.9						
Peak Hour	09:45		03:00		10:45		03:45		10:30		03:45	
Volume	226		148		138		165		310		294	
Factor	0.84		0.84		0.86		0.72		0.88		0.79	

Wilson Okamoto Coporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Dickenson Street
Title2 : Lahaina Small Boat Harbor
Title3 :

Site: 100000000000
Date: 03/08/06
Day: Wednesday

Interval	WB AM		WB PM		EB AM		EB PM		Combined AM		Combined PM	
Begin	AM		PM		AM		PM		AM		PM	
12:00	*		*		*		*		*		*	
12:15	*		*		*		*		*		*	
12:30	*		*		*		*		*		*	
12:45	*		*		*		*		*		*	
01:00	*		*		*		*		*		*	
01:15	*		*		*		*		*		*	
01:30	*		*		*		*		*		*	
01:45	*		25		*		18		*		43	
02:00	*		32	182	*		32	134	*		64	316
02:15	*		54		*		30		*		84	
02:30	*		48		*		36		*		84	
02:45	*		48		*		36		*		84	
03:00	*		66	245	*		38	176	*		104	421
03:15	*		55		*		42		*		97	
03:30	*		58		*		36		*		94	
03:45	*		66		*		60		*		126	
04:00	*		67	208	*		46	160	*		113	368
04:15	*		37		*		44		*		81	
04:30	*		54		*		40		*		94	
04:45	*		50		*		30		*		80	
05:00	*		52	193	*		30	114	*		82	307
05:15	*		59		*		24		*		83	
05:30	*		42		*		32		*		74	
05:45	*		40		*		28		*		68	
06:00	*		48	190	*		33	101	*		81	291
06:15	*		60		*		23		*		83	
06:30	*		32		*		20		*		52	
06:45	*		50		*		25		*		75	
07:00	*		38	165	*		17	100	*		55	265
07:15	*		45		*		28		*		73	
07:30	*		36		*		20		*		56	
07:45	*		46		*		35		*		81	
08:00	*		20	119	*		18	87	*		38	206
08:15	*		42		*		22		*		64	
08:30	*		33		*		27		*		60	
08:45	*		24		*		20		*		44	
09:00	*		30	97	*		18	62	*		48	159
09:15	*		20		*		14		*		34	
09:30	*		28		*		16		*		44	
09:45	*		19		*		14		*		33	
10:00	*		12	52	*		16	57	*		28	109
10:15	*		16		*		8		*		24	
10:30	*		12		*		12		*		24	
10:45	*		12		*		21		*		33	
11:00	*		6	46	*		14	24	*		20	70
11:15	*		12		*		4		*		16	
11:30	*		15		*		0		*		15	
11:45	*		13		*		6		*		19	
Totals	0		1,522		0		1,033		0		2,555	
Split%	*		59.6		*		40.4					
Day Totals		1,522				1,033				2,555		
Day Splits		59.6				40.4						
Peak Hour	*		03:15		*		03:45		*		03:15	
Volume	*		246		*		190		*		430	
Factor	*		0.92		*		0.79		*		0.85	

Wilson Okamoto Coporation

1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Dickenson Street
le2 : Lahaina Small Boat Harbor
le3 :

Site: 100000000000
Date: 03/09/06
Day: Thursday

Interval Begin	WB AM		WB PM		EB AM		EB PM		Combined AM		Combined PM	
12:00	11	29	61	226	1	8	35	167	12	37	96	393
12:15	10		42		2		38		12		80	
12:30	4		66		1		46		5		112	
12:45	4		57		4		48		8		105	
01:00	4	11	64	239	8	14	34	175	12	25	98	414
01:15	4		50		4		42		8		92	
01:30	1		66		2		58		3		124	
01:45	2		59		0		41		2		100	
02:00	0	6	36	283	2	12	60	220	2	18	96	503
02:15	2		84		6		64		8		148	
02:30	2		98		2		50		4		148	
02:45	2		65		2		46		4		111	
03:00	3	8	62	253	0	5	55	220	3	13	117	473
03:15	2		54		2		57		4		111	
03:30	0		65		2		52		2		117	
03:45	3		72		1		56		4		128	
04:00	3	10	69	258	2	2	56	209	5	12	125	467
04:15	4		66		0		48		4		114	
04:30	2		55		0		56		2		111	
04:45	1		68		0		49		1		117	
05:00	8	29	58		*	6	40		6	35	98	
05:15	1		45		2		36		3		81	
05:30	8		0		2		0		10		0	
05:45	12		*		4		*		16		*	
06:00	19	101	*		0	33	*		19	134	*	
06:15	25		*		12		*		37		*	
06:30	26		*		11		*		37		*	
06:45	31		*		10		*		41		*	
07:00	30	192	*		22	112	*		52	304	*	
07:15	56		*		38		*		94		*	
07:30	65		*		38		*		103		*	
07:45	41		*		14		*		55		*	
08:00	45	189	*		22	97	*		67	286	*	
08:15	44		*		29		*		73		*	
08:30	37		*		18		*		55		*	
08:45	63		*		28		*		91		*	
09:00	69	219	*		21	122	*		90	341	*	
09:15	48		*		34		*		82		*	
09:30	50		*		39		*		89		*	
09:45	52		*		28		*		80		*	
10:00	46	198	*		44	170	*		90	368	*	
10:15	40		*		28		*		68		*	
10:30	54		*		42		*		96		*	
10:45	58		*		56		*		114		*	
11:00	60	239	*		58	200	*		118	439	*	
11:15	56		*		44		*		100		*	
11:30	60		*		56		*		116		*	
11:45	63		*		42		*		105		*	
Totals	1,231		1,362		783		1,067		2,012		2,429	
Split%	61.2		56.1		38.9		43.9					
Day Totals		2,593				1,850				4,441		
Day Splits		58.4				41.7						
Peak Hour	11:00		02:15		10:45		01:30		10:45		02:15	
Volume	239		309		214		223		448		524	
Factor	0.95		0.79		0.92		0.87		0.95		0.89	

Wilson Okamoto Corporation

1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Canal Street
le2 : Lahaina Small Boat Harbor
le3 :

Site: 100000000000
Date: 04/18/06
Day: Tuesday

Interval Begin	EBL AM		EBL PM		EBR AM		EBR PM		Combined AM		Combined PM	
12:00	*		*		*		*		*		*	
12:15	*		*		*		*		*		*	
12:30	*		*		*		*		*		*	
12:45	*		*		*		*		*		*	
01:00	*		*		*		*		*		*	
01:15	*		*		*		*		*		*	
01:30	*		*		*		*		*		*	
01:45	*		*		*		*		*		*	
02:00	*		*		*		*		*		*	
02:15	*		*		*		*		*		*	
02:30	*		25		*		14		*		39	
02:45	*		40		*		16		*		56	
03:00	*		24	98	*		24	52	*		48	150
03:15	*		18		*		10		*		28	
03:30	*		30		*		15		*		45	
03:45	*		26		*		3		*		29	
04:00	*		38	110	*		0	34	*		38	144
04:15	*		28		*		0		*		28	
04:30	*		20		*		16		*		36	
04:45	*		24		*		18		*		42	
05:00	*		14	57	*		14	48	*		28	105
05:15	*		23		*		6		*		29	
05:30	*		4		*		24		*		28	
05:45	*		16		*		4		*		20	
06:00	*		12	55	*		11	28	*		23	83
06:15	*		19		*		6		*		25	
06:30	*		10		*		6		*		16	
06:45	*		14		*		5		*		19	
07:00	*		12	64	*		4	29	*		16	93
07:15	*		20		*		8		*		28	
07:30	*		16		*		11		*		27	
07:45	*		16		*		6		*		22	
08:00	*		12	56	*		5	27	*		17	83
08:15	*		22		*		4		*		26	
08:30	*		8		*		10		*		18	
08:45	*		14		*		8		*		22	
09:00	*		12	51	*		0		*		12	
09:15	*		19		*		4		*		23	
09:30	*		10		*		8		*		18	
09:45	*		10		*		*		*		*	
10:00	*		8	22	*		4	12	*		12	34
10:15	*		8		*		2		*		10	
10:30	*		2		*		2		*		4	
10:45	*		4		*		4		*		8	
11:00	*		4	11	*		0	9	*		4	20
11:15	*		4		*		6		*		10	
11:30	*		2		*		3		*		5	
11:45	*		1		*		0		*		1	
Totals	0		589		0		281		0		860	
Split%	*		68.5		*		32.7					
Day Totals		589				281				860		
Day Splits		68.5				32.7						
Peak Hour	*		03:30		*		02:45		*		02:45	
Volume	*		122		*		65		*		177	
Factor	*		0.80		*		0.68		*		0.79	

Wilson Okamoto Corporation

1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Canal Street
? e2 : Lahaina Small Boat Harbor
? e3 :

Site: 100000000000
Date: 04/19/06
Day: Wednesday

Interval Begin	EBL AM		EBL PM		EBR AM		EBR PM		Combined AM		Combined PM	
2:00	2	5	30	98	3	10	*		5	15	0	0
.2:15	0		26		4		*		4		0	
12:30	3		24		1		*		4		0	
12:45	0		18		2		*		2		0	
11.00	0	2	28	107	6	4	*		6	6	0	0
)1:15	0		37		0		*		0		0	
01:30	0		22		0		*		0		0	
01:45	2		20		*		*		0		0	
)2:00	2	3	16	86	*		*		0		0	0
)2:15	0		20		0		*		0		0	
02:30	1		20		*		*		*		0	
02:45	0		30		0		*		0		0	
)3:00	1	3	22	71	*		*		*		0	0
)3:15	0		17		0		*		0		0	
03:30	0		16		0		*		0		0	
03:45	2		16		*		*		0		0	
)4:00	1	12	21	77	*		*		*		0	0
)4:15	1		18		*		*		*		0	
04:30	4		18		*		*		0		0	
04:45	6		20		*		*		0		0	
)5:00	1	11	26	59	*		*		*		0	1
)5:15	1		16		*		*		*		0	
05:30	7		17		*		*		0		1	
05:45	2		0		*		0		0		0	
)6:00	9	41	*		*		*		0	0	*	
)6:15	10		*		*		*		0		*	
)6:30	9		*		*		*		0		*	
06:45	13		*		*		*		0		*	
)7:00	12	98	*		*		*		0	0	*	
)7:15	38		*		*		*		0		*	
)7:30	38		*		*		*		0		*	
07:45	10		*		*		*		0		*	
08:00	12	49	*		*		*		0	0	*	
08:15	8		*		*		*		0		*	
08:30	6		*		*		*		0		*	
08:45	23		*		*		*		0		*	
09:00	15	63	*		*		*		0	0	*	
09:15	9		*		*		*		0		*	
09:30	17		*		*		*		0		*	
09:45	22		*		*		*		0		*	
10:00	17	74	*		*		*		0	0	*	
10:15	12		*		*		*		0		*	
10:30	22		*		*		*		0		*	
10:45	23		*		*		*		0		*	
11:00	18	65	*		*		*		12	12	*	
11:15	12		*		*		*		0		*	
11:30	10		*		*		*		0		*	
11:45	25		*		*		*		0		*	
Totals	426		498		16		0		33		1	
lit%	1,290.9		9,800.0		48.5		0.0					
Day Totals		924				16				34		
''ay Splits		2,717.6				47.1						
..ak Hour	06:45		12:30		*		*		12:15		04:45	
Volume	101		107		*		*		16		1	
ctor	0.66		0.72		*		*		0.67		0.25	

Wilson Okamoto Corporation

1907 S. Beretania Street #400
Honolulu, HI 96826

T''1 : Prison Street
T 2 : Lahaina Small Boat Harbor
Title3 :

Site: 03
Date: 04/18/06
Day: Tuesday

Interval Begin	WB AM	WB PM		EB AM	EB PM		Combined AM	Combined PM	
2:00	*	*		*	*		*	*	
12:15	*	*		*	*		*	*	
12:30	*	*		*	*		*	*	
2:45	*	*		*	*		*	*	
1:00	*	*		*	*		*	*	
01:15	*	*		*	*		*	*	
01:30	*	*		*	*		*	*	
1:45	*	*		*	*		*	*	
2:00	*	25	161	*	65	229	*	90	390
02:15	*	50		*	63		*	113	
02:30	*	46		*	57		*	103	
2:45	*	40		*	44		*	84	
03:00	*	70	217	*	44	184	*	114	401
03:15	*	44		*	44		*	88	
03:30	*	45		*	48		*	93	
)3:45	*	58		*	48		*	106	
)4:00	*	33	147	*	50	194	*	83	341
04:15	*	38		*	52		*	90	
04:30	*	40		*	50		*	90	
)4:45	*	36		*	42		*	78	
)5:00	*	38	125	*	38	132	*	76	257
)5:15	*	26		*	32		*	58	
05:30	*	32		*	30		*	62	
05:45	*	29		*	32		*	61	
06:00	*	29	82	*	19	79	*	48	161
06:15	*	21		*	12		*	33	
06:30	*	18		*	30		*	48	
06:45	*	14		*	18		*	32	
07:00	*	20	64	*	30	93	*	50	157
07:15	*	14		*	25		*	39	
07:30	*	10		*	24		*	34	
07:45	*	20		*	14		*	34	
08:00	*	12	39	*	16	74	*	28	113
08:15	*	10		*	20		*	30	
08:30	*	11		*	18		*	29	
08:45	*	6		*	20		*	26	
09:00	*	17	50	*	22	72	*	39	122
09:15	*	12		*	14		*	26	
09:30	*	8		*	18		*	26	
09:45	*	13		*	18		*	31	
10:00	*	9	27	*	18	44	*	27	71
10:15	*	5		*	13		*	18	
10:30	*	6		*	8		*	14	
10:45	*	7		*	5		*	12	
11:00	*	2	9	*	4	9	*	6	18
11:15	*	2		*	3		*	5	
11:30	*	4		*	0		*	4	
11:45	*	1		*	2		*	3	
otals	0	921		0	1,110		0	2,031	
plit%	*	45.3		*	54.7				
Day Totals	921			1,110			2,031		
ay Splits	45.3			54.7					
Peak Hour	*	03:00		*	02:00		*	02:15	
''olume	*	217		*	229		*	414	
actor	*	0.77		*	0.88		*	0.91	

Wilson Okamoto Corporation

1907 S. Beretania Street #400
Honolulu, HI 96826

File1 : Prison Street
File2 : Lahaina Small Boat Harbor
File3 :

Site: 03
Date: 04/19/06
Day: Wednesday

Interval Begin	WB AM		WB PM		EB AM		EB PM		Combined AM		Combined PM	
2:00	1	8	52	177	5	14	36	140	6	22	88	317
12:15	4		34		4		33		8		67	
12:30	2		31		2		38		4		69	
2:45	1		60		3		33		4		93	
1:00	4	8	78	226	2	8	32	199	6	16	110	425
01:15	2		70		2		76		4		146	
01:30	1		42		2		51		3		93	
1:45	1		36		2		40		3		76	
2:00	0	2	28	142	2		30	155	2		58	297
02:15	1		42		0		45		1		87	
02:30	1		34		*		38		*		72	
2:45	0		38		0		42		0		80	
3:00	1	5	46	161	2	2	47	141	3	7	93	302
03:15	1		28		0		23		1		51	
03:30	1		37		0		41		1		78	
3:45	2		50		0		30		2		80	
4:00	1	5	34	130	0	1	40	154	1	6	74	284
04:15	1		29		0		46		1		75	
04:30	2		36		0		26		2		62	
4:45	1		31		1		42		2		73	
5:00	2	13	22	108	1	4	32	78	3	17	54	186
5:15	2		48		1		24		3		72	
05:30	1		38		0		22		1		60	
05:45	8		0		2		0		10		0	
6:00	7	54	*		10	34	*		17	88	*	
6:15	16		*		4		*		20		*	
06:30	11		*		12		*		23		*	
06:45	20		*		8		*		28		*	
07:00	41	223	*		20	163	*		61	386	*	
07:15	50		*		34		*		84		*	
07:30	94		*		55		*		149		*	
07:45	38		*		54		*		92		*	
08:00	26	123	*		18	79	*		44	202	*	
08:15	26		*		16		*		42		*	
08:30	21		*		23		*		44		*	
08:45	50		*		22		*		72		*	
09:00	31	126	*		20	106	*		51	232	*	
09:15	30		*		26		*		56		*	
09:30	30		*		20		*		50		*	
09:45	35		*		40		*		75		*	
10:00	29	133	*		24	119	*		53	252	*	
10:15	34		*		44		*		78		*	
10:30	32		*		25		*		57		*	
10:45	38		*		26		*		64		*	
11:00	32	147	*		30	140	*		62	287	*	
11:15	32		*		24		*		56		*	
11:30	41		*		36		*		77		*	
11:45	42		*		50		*		92		*	
Totals	847		944		672		867		1,518		1,811	
Split%	55.8		52.1		44.3		47.9					

	WB		EB		Combined	
Day Totals	1,791		1,539		3,329	
Day Splits	53.8		46.2			
Peak Hour	07:00	12:45	07:00	01:00	07:00	12:45
Volume	223	250	163	199	386	442
Factor	0.59	0.80	0.74	0.65	0.65	0.76

Wilson Okamoto Corporation

1907 S. Beretania Street #400
Honolulu, HI 96826

File1 : Dickenson Street
File2 : Lahaina Small Boat Harbor
File3 :

Site: 100000000000
Date: 04/18/06
Day: Tuesday

Interval Begin	WB AM		WB PM		EB AM		EB PM		Combined AM		Combined PM	
2:00	*		*		*		*		*		*	
12:15	*		*		*		*		*		*	
12:30	*		*		*		*		*		*	
2:45	*		*		*		*		*		*	
1:00	*		*		*		*		*		*	
01:15	*		*		*		*		*		*	
01:30	*		*		*		*		*		*	
1:45	*		*		*		*		*		*	
2:00	*		*		*		*		*		*	
02:15	*		22		*		26		*		48	
02:30	*		39		*		62		*		101	
2:45	*		50		*		82		*		132	
3:00	*		45	169	*		54	222	*		99	391
03:15	*		54		*		50		*		104	
03:30	*		34		*		58		*		92	
3:45	*		36		*		60		*		96	
4:00	*		50	164	*		65	234	*		115	398
04:15	*		44		*		72		*		116	
04:30	*		34		*		51		*		85	
4:45	*		36		*		46		*		82	
5:00	*		46	158	*		52	211	*		98	369
5:15	*		36		*		55		*		91	
05:30	*		38		*		42		*		80	
05:45	*		38		*		62		*		100	
6:00	*		33	119	*		52	177	*		85	296
6:15	*		30		*		34		*		64	
06:30	*		24		*		52		*		76	
06:45	*		32		*		39		*		71	
7:00	*		42	137	*		61	193	*		103	330
7:15	*		29		*		46		*		75	
07:30	*		27		*		42		*		69	
07:45	*		39		*		44		*		83	
08:00	*		23	91	*		48	156	*		71	247
08:15	*		25		*		44		*		69	
08:30	*		24		*		38		*		62	
08:45	*		19		*		26		*		45	
09:00	*		20	68	*		32	113	*		52	181
09:15	*		18		*		32		*		50	
09:30	*		14		*		22		*		36	
09:45	*		16		*		27		*		43	
10:00	*		13	63	*		36	94	*		49	157
10:15	*		16		*		27		*		43	
10:30	*		18		*		23		*		41	
10:45	*		16		*		8		*		24	
11:00	*		8	22	*		20	53	*		28	75
11:15	*		5		*		19		*		24	
11:30	*		5		*		6		*		11	
11:45	*		4		*		8		*		12	
Totals	0		1,102		0		1,623		0		2,725	
Split%	*		40.4		*		59.6					

	WB		EB		Combined	
Day Totals	1,102		1,623		2,725	
Day Splits	40.4		59.6			
Peak Hour	*	02:30	*	03:30	*	02:30
Volume	*	188	*	255	*	436
Factor	*	0.87	*	0.89	*	0.83

Wilson Okamoto Corporation
1907 S. Beretania Street #400
Honolulu, HI 96826

Title1 : Dickenson Street
T :2 : Lahaina Small Boat Harbor
T..e3 :

Site: 100000000000
Date: 04/19/06
Day: Wednesday

Interval	WB AM		WB PM		EB AM		EB PM		Combined AM		Combined PM	
B in	AM		PM		AM		PM		AM		PM	
2:00	2	11	35	123	12	30	70	230	14	41	105	353
12:15	5		28		8		52		13		80	
12:30	2		34		6		50		8		84	
2:45	2		26		4		58		6		84	
1:00	4	14	40	129	6	23	82	278	10	37	122	407
01:15	6		28		6		72		12		100	
01:30	2		31		3		66		5		97	
01:45	2		30		8		58		10		88	
02:00	4	9	30	126	16		74	252	20		104	378
02:15	2		36		*		56		0		92	
02:30	2		33		*		52		0		85	
02:45	1		27		*		70		*		97	
03:00	2	7	30	130	*		63	253	0		93	383
03:15	1		32		*		68		*		100	
03:30	1		32		*		54		*		86	
03:45	3		36		*		68		0		104	
04:00	5	10	34	122	*		54	258	0		88	380
04:15	0		28		0		72		0		100	
04:30	1		24		*		60		*		84	
04:45	4		36		*		72		0		108	
05:00	4	32	34		*		50		0	0	84	
05:15	6		26		*		37		0		63	
05:30	6		0		*		0		0		0	
05:45	16		*		*		*		0		*	
06:00	16	68	*		*		*		0	14	*	
06:15	14		*		*		*		0		*	
06:30	13		*		*		*		0		*	
06:45	25		*		*		*		14		*	
07:00	16	84	*		21	92	*		37	176	*	
07:15	24		*		16		*		40		*	
07:30	22		*		25		*		47		*	
07:45	22		*		30		*		52		*	
08:00	22	111	*		24	90	*		46	201	*	
08:15	29		*		24		*		53		*	
08:30	33		*		12		*		45		*	
08:45	27		*		30		*		57		*	
09:00	18	113	*		20	71	*		38	184	*	
09:15	24		*		*		*		1		*	
09:30	38		*		26		*		64		*	
09:45	33		*		48		*		81		*	
10:00	34	131	*		28	144	*		62	275	*	
10:15	28		*		32		*		60		*	
10:30	42		*		50		*		92		*	
10:45	27		*		34		*		61		*	
11:00	29	103	*		46	120	*		75	223	*	
11:15	24		*		30		*		54		*	
11:30	26		*		*		*		24		*	
11:45	24		*		46		*		70		*	
Totals	693		690		611		1,358		1,171		2,048	
Split%	59.2		33.7		52.2		66.3					

	WB		EB		Combined	
Day Totals	1,383		1,969		3,219	
Day Splits	43.0		61.2			
Peak Hour	09:45	03:15	10:15	12:45	09:45	01:00
Volume	137	134	162	278	295	407
Factor	0.82	0.93	0.81	0.85	0.80	0.83

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

"Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK HOUR TRAFFIC ANALYSIS

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	70	285			195	115
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	77	316			216	127
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT				TR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	77							
C(m) (vph)	1216							
v/c	0.06							
95% queue length	0.20							
Control Delay	8.2							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	46	346			295	83
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	51	384			327	92
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT				TR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	51							
C(m) (vph)	1140							
v/c	0.04							
95% queue length	0.14							
Control Delay	8.3							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	60	314			166	98
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	66	348			184	108
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	66							
C(m) (vph)	1270							
v/c	0.05							
95% queue length	0.16							
Control Delay	8.0							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	62	352			304	93
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	68	391			337	103
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	68							
C(m) (vph)	1120							
v/c	0.06							
95% queue length	0.19							
Control Delay	8.4							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		217			161	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		241			178	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				201		76
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				223		84
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						223		84
C(m) (vph)						591		865
v/c						0.38		0.10
95% queue length						1.80		0.32
Control Delay						14.8		9.6
LOS						B		A
Approach Delay							13.4	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		307			189	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		341			210	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				137		144
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				152		160
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						152		160
C(m) (vph)						495		830
v/c						0.31		0.19
95% queue length						1.32		0.71
Control Delay						15.5		10.4
LOS						C		B
Approach Delay							12.9	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		326			141	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		362			156	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				98		37
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				108		41
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						108		41
C(m) (vph)						518		890
v/c						0.21		0.05
95% queue length						0.79		0.14
Control Delay						13.8		9.2
LOS						B		A
Approach Delay							12.5	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		333			218	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		370			242	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				106		116
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				117		128
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						117		128
C(m) (vph)						456		797
v/c						0.26		0.16
95% queue length						1.03		0.57
Control Delay						15.6		10.4
LOS						C		B
Approach Delay							12.9	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		166	33	61	162	
Peak-Hour Factor, PHF		0.86	0.86	0.88	0.88	
Hourly Flow Rate, HFR		193	38	69	184	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	29		70			
Peak Hour Factor, PHF	0.78		0.78			
Hourly Flow Rate, HFR	37		89			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		69		126				
C(m) (vph)		1081		481				
v/c		0.06		0.26				
95% queue length		0.20		1.06				
Control Delay		8.6		15.1				
LOS		A		C				
Approach Delay				15.1				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		263	81	70	224	
Peak-Hour Factor, PHF		0.86	0.86	0.85	0.85	
Hourly Flow Rate, HFR		305	94	82	263	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	53		51			
Peak Hour Factor, PHF	0.88		0.88			
Hourly Flow Rate, HFR	60		57			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		82		117				
C(m) (vph)		919		311				
v/c		0.09		0.38				
95% queue length		0.29		1.78				
Control Delay		9.3		23.5				
LOS		A		C				
Approach Delay				23.5				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		232	111	50	118	
Peak-Hour Factor, PHF		0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR		257	123	55	131	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	109		99			
Peak Hour Factor, PHF	0.90		0.90			
Hourly Flow Rate, HFR	121		110			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		55		231				
C(m) (vph)		976		417				
v/c		0.06		0.55				
95% queue length		0.18		3.59				
Control Delay		8.9		24.2				
LOS		A		C				
Approach Delay				24.2				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		259	57	78	235	
Peak-Hour Factor, PHF		0.83	0.83	0.86	0.86	
Hourly Flow Rate, HFR		312	68	90	273	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	45		77			
Peak Hour Factor, PHF	0.76		0.76			
Hourly Flow Rate, HFR	59		101			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		90		160				
C(m) (vph)		954		349				
v/c		0.09		0.46				
95% queue length		0.31		2.47				
Control Delay		9.2		24.0				
LOS		A		C				
Approach Delay				24.0				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	49	87	27	34	104	38
Peak-Hour Factor, PHF	0.87	0.87	0.87	0.70	0.70	0.70
Hourly Flow Rate, HFR	56	99	31	48	148	54
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	59	81	3	14	67	62
Peak Hour Factor, PHF	0.80	0.80	0.80	0.75	0.75	0.75
Hourly Flow Rate, HFR	73	101	3	18	89	82
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	56	48		177			189	
C(m) (vph)	1370	1439		507			698	
v/c	0.04	0.03		0.35			0.27	
95% queue length	0.13	0.10		1.59			1.11	
Control Delay	7.7	7.6		15.9			12.1	
LOS	A	A		C			B	
Approach Delay				15.9			12.1	
Approach LOS				C			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	103	47	12	19	59	35
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83
Hourly Flow Rate, HFR	117	53	13	22	71	42
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	9	106	4	32	257	124
Peak Hour Factor, PHF	0.73	0.73	0.73	0.88	0.88	0.88
Hourly Flow Rate, HFR	12	145	5	36	292	140
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	117	22		162			468	
C(m) (vph)	1476	1530		543			696	
v/c	0.08	0.01		0.30			0.67	
95% queue length	0.26	0.04		1.27			5.86	
Control Delay	7.6	7.4		14.4			20.6	
LOS	A	A		B			C	
Approach Delay				14.4			20.6	
Approach LOS				B			C	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	74	9	14	20	139	65
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	82	10	15	22	154	72
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	42	141	4	12	64	49
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	46	156	4	13	71	54
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	82	22		206			138	
C(m) (vph)	1338	1576		657			809	
v/c	0.06	0.01		0.31			0.17	
95% queue length	0.20	0.04		1.36			0.62	
Control Delay	7.9	7.3		13.0			10.4	
LOS	A	A		B			B	
Approach Delay				13.0			10.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	40	70	32	12	45	29
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.83	0.83	0.83
Hourly Flow Rate, HFR	51	90	41	14	54	34
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	54	145	2	21	254	10
Peak Hour Factor, PHF	0.80	0.80	0.80	0.86	0.86	0.86
Hourly Flow Rate, HFR	67	181	2	24	295	11
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	51	14		250			330	
C(m) (vph)	1508	1454		712			757	
v/c	0.03	0.01		0.35			0.44	
95% queue length	0.10	0.03		1.61			2.29	
Control Delay	7.5	7.5		12.8			13.4	
LOS	A	A		B			B	
Approach Delay				12.8			13.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	80	812	1		638	76
Peak-Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	88	902	1		708	84
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	1		2	98
Peak Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	0	0	1		2	108
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	88			1				110
C(m) (vph)	829			554				613
v/c	0.11			0.00				0.18
95% queue length	0.36			0.01				0.65
Control Delay	9.9			11.5				12.2
LOS	A			B				B
Approach Delay				11.5			12.2	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	59	892	4		814	51
Peak-Hour Factor, PHF	0.93	0.93	0.93		0.90	0.90
Hourly Flow Rate, HFR	63	959	4		904	56
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	2		9	103
Peak Hour Factor, PHF	0.50	0.50	0.50		0.80	0.80
Hourly Flow Rate, HFR	0	0	4		11	128
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	63			4				139
C(m) (vph)	717			517				400
v/c	0.09			0.01				0.35
95% queue length	0.29			0.02				1.58
Control Delay	10.5			12.0				18.8
LOS	B			B				C
Approach Delay				12.0			18.8	
Approach LOS				B			C	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	104	924	0		517	86
Peak-Hour Factor, PHF	0.95	0.95	0.95		0.92	0.92
Hourly Flow Rate, HFR	109	972	0		561	93
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	1		1	22
Peak Hour Factor, PHF	0.90	0.90	0.90		0.60	0.60
Hourly Flow Rate, HFR	0	0	1		1	36
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	109			1				37
C(m) (vph)	933			510				740
v/c	0.12			0.00				0.05
95% queue length	0.40			0.01				0.16
Control Delay	9.4			12.1				10.1
LOS	A			B				B
Approach Delay				12.1			10.1	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	30	921	3		851	54
Peak-Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	33	1023	3		945	60
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	3		2	101
Peak Hour Factor, PHF	0.90	0.90	0.90		0.60	0.60
Hourly Flow Rate, HFR	0	0	3		3	168
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	33			3				171
C(m) (vph)	689			480				501
v/c	0.05			0.01				0.34
95% queue length	0.15			0.02				1.54
Control Delay	10.5			12.5				15.9
LOS	B			B				C
Approach Delay				12.5			15.9	
Approach LOS				B			C	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		211	55	56	274	
Peak-Hour Factor, PHF		0.95	0.95	0.87	0.87	
Hourly Flow Rate, HFR		222	57	64	314	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	44		33			
Peak Hour Factor, PHF	0.72		0.72			
Hourly Flow Rate, HFR	61		45			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		64		106				
C(m) (vph)		873		542				
v/c		0.07		0.20				
95% queue length		0.24		0.73				
Control Delay		9.4		13.3				
LOS		A		B				
Approach Delay				13.3				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		296	49	62	357	
Peak-Hour Factor, PHF		0.92	0.92	0.90	0.90	
Hourly Flow Rate, HFR		321	53	68	396	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	58		39			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	77		52			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		68		129				
C(m) (vph)		504		258				
v/c		0.13		0.50				
95% queue length		0.47		2.87				
Control Delay		13.3		32.7				
LOS		B		D				
Approach Delay				32.7				
Approach LOS				D				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		273	36	20	248	
Peak-Hour Factor, PHF		0.80	0.80	0.74	0.74	
Hourly Flow Rate, HFR		341	44	27	335	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	26		33			
Peak Hour Factor, PHF	0.85		0.85			
Hourly Flow Rate, HFR	30		38			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		27		68				
C(m) (vph)		889		685				
v/c		0.03		0.10				
95% queue length		0.09		0.33				
Control Delay		9.2		10.8				
LOS		A		B				
Approach Delay				10.8				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		292	57	80	361	
Peak-Hour Factor, PHF		0.88	0.88	0.97	0.97	
Hourly Flow Rate, HFR		331	64	82	372	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	58		45			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	61		47			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		82		108				
C(m) (vph)		776		495				
v/c		0.11		0.22				
95% queue length		0.35		0.83				
Control Delay		10.2		14.3				
LOS		B		B				
Approach Delay				14.3				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	38	55	22	48	70	26	15	147	21	8	116	48
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.79		0.82		0.86		0.76	
Flow Rate	144		174		211		225	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	144		174		211		225	
Left-Turn	48		58		17		10	
Right-Turn	27		31		24		63	
Prop. Left-Turns	0.3		0.3		0.1		0.0	
Prop. Right-Turns	0.2		0.2		0.1		0.3	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.0		-0.0		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	144		174		211		225	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13		0.15		0.19		0.20	
hd, final value	5.31		5.26		5.09		4.97	
x, final value	0.21		0.25		0.30		0.31	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	3.3		3.3		3.1		3.0	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	144		174		211		225	
Service Time	3.3		3.3		3.1		3.0	
Utilization, x	0.21		0.25		0.30		0.31	
Dep. headway, hd	5.31		5.26		5.09		4.97	
Capacity	394		424		461		475	
Delay	9.74		10.06		10.24		10.20	
LOS	A		B		B		B	
Approach:								
Delay	9.74		10.06		10.24		10.20	
LOS	A		B		B		B	

Intersection Delay 10.09 Intersection LOS B

HCS+: Unsignalized Intersections Release 5.2

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	62	77	28	140	83	7	15	234	44	18	254	53
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.81		0.83		0.96		0.87	
Flow Rate	205		276		303		371	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	
Duration, T 1.00 hrs.								

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	205		276		303		371	
Left-Turn	76		168		15		20	
Right-Turn	34		8		45		60	
Prop. Left-Turns	0.4		0.6		0.0		0.1	
Prop. Right-Turns	0.2		0.0		0.1		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.0		0.1		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	205		276		303		371	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.18		0.25		0.27		0.33	
hd, final value	6.85		6.76		6.40		6.24	
x, final value	0.39		0.52		0.54		0.64	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.8		4.8		4.4		4.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	205		276		303		371	
Service Time	4.8		4.8		4.4		4.2	
Utilization, x	0.39		0.52		0.54		0.64	
Dep. headway, hd	6.85		6.76		6.40		6.24	
Capacity	451		482		516		543	
Delay	14.21		16.99		16.81		20.32	
LOS	B		C		C		C	
Approach:								
Delay	14.21		16.99		16.81		20.32	
LOS	B		C		C		C	

Intersection Delay 17.52 Intersection LOS C

HCS+: Unsignalized Intersections Release 5.2

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	20	43	11	38	38	2	11	142	47	10	93	23
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.68		0.98		0.78		0.81	
Flow Rate	108		78		256		154	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	108		78		256		154	
Left-Turn	29		38		14		12	
Right-Turn	16		2		60		28	
Prop. Left-Turns	0.3		0.5		0.1		0.1	
Prop. Right-Turns	0.1		0.0		0.2		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj		0.2		0.2		0.2		0.2
hRT-adj		-0.6		-0.6		-0.6		-0.6
hHV-adj		1.7		1.7		1.7		1.7
hadj, computed	-0.0		0.1		-0.1		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	108		78		256		154	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.10		0.07		0.23		0.14	
hd, final value	4.98		5.15		4.49		4.64	
x, final value	0.15		0.11		0.32		0.20	
Move-up time, m		2.0		2.0		2.0		2.0
Service Time	3.0		3.1		2.5		2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	108		78		256		154	
Service Time	3.0		3.1		2.5		2.6	
Utilization, x	0.15		0.11		0.32		0.20	
Dep. headway, hd	4.98		5.15		4.49		4.64	
Capacity	358		328		506		404	
Delay	8.86		8.79		9.59		8.79	
LOS	A		A		A		A	
Approach:								
Delay		8.86		8.79		9.59		8.79
LOS		A		A		A		A

Intersection Delay 9.15 Intersection LOS A

HCS+: Unsignalized Intersections Release 5.2

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Existing-(Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	63	74	19	100	81	20	24	236	38	21	250	81
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.85		0.91		0.92		0.90	
Flow Rate	183		219		323		390	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	183		219		323		390	
Left-Turn	74		109		26		23	
Right-Turn	22		21		41		90	
Prop. Left-Turns	0.4		0.5		0.1		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.0		0.1		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	183		219		323		390	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.16		0.19		0.29		0.35	
hd, final value	6.67		6.60		6.03		5.85	
x, final value	0.34		0.40		0.54		0.63	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.7		4.6		4.0		3.8	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	183		219		323		390	
Service Time	4.7		4.6		4.0		3.8	
Utilization, x	0.34		0.40		0.54		0.63	
Dep. headway, hd	6.67		6.60		6.03		5.85	
Capacity	433		469		556		584	
Delay	13.08		14.01		16.10		18.81	
LOS	B		B		C		C	
Approach:								
Delay	13.08		14.01		16.10		18.81	
LOS	B		B		C		C	

Intersection Delay 16.14 Intersection LOS C

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: AM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Existing-(Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	38	23	23	31	13	26	40	728	44	12	655	91
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			2			3			4			9

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	29.0					26.0	65.0		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	326	1517	0.28	0.21	44.7	D	44.7	D
Westbound								
LTR	322	1501	0.23	0.21	44.1	D	44.1	D
Northbound								
L	359	1863	0.12	0.19	45.2	D		
TR	937	1946	0.91	0.48	45.1	D	45.1	D
Southbound								
L	359	1863	0.04	0.19	44.4	D		
TR	1768	3671	0.46	0.48	23.6	C	23.9	C

Intersection Delay = 35.7 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: PM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Existing-(Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	59	31	27	34	21	26	28	840	57	11	816	185
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			3			3			6			19

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	31.0					19.5	69.5		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	323	1405	0.62	0.23	50.4	D	50.4	D
Westbound								
LTR	327	1425	0.29	0.23	43.5	D	43.5	D
Northbound								
L	269	1863	0.11	0.14	50.4	D		
TR	1001	1944	0.94	0.51	51.2	D	51.1	D
Southbound								
L	269	1863	0.04	0.14	49.8	D		
TR	1873	3638	0.59	0.51	23.3	C	23.6	C

Intersection Delay = 37.8 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: AM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Existing-(Non Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	40	28	11	27	19	37	17	854	51	13	522	124
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			1			4			5			12

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	28.5					22.0	69.5		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	305	1444	0.41	0.21	46.9	D	46.9	D
Westbound								
LTR	326	1545	0.30	0.21	45.4	D	45.4	D
Northbound								
L	304	1863	0.06	0.16	47.8	D		
TR	1002	1946	0.93	0.51	47.7	D	47.7	D
Southbound								
L	304	1863	0.05	0.16	47.7	D		
TR	1871	3634	0.37	0.51	19.7	B	20.3	C

Intersection Delay = 37.2 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: PM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Existing-(Non Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	57	44	33	51	42	17	24	821	80	15	821	99
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			3			2			8			10

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	29.5					21.0	69.5		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	305	1395	0.58	0.22	50.0	D	50.0	D
Westbound								
LTR	294	1344	0.48	0.22	47.3	D	47.3	D
Northbound								
L	290	1863	0.09	0.16	48.9	D		
TR	997	1937	0.93	0.51	49.9	D	49.9	D
Southbound								
L	290	1863	0.06	0.16	48.7	D		
TR	1894	3679	0.54	0.51	22.3	C	22.7	C

Intersection Delay = 37.5 (sec/veh) Intersection LOS = D

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2010 PEAK HOUR TRAFFIC
ANALYSIS WITH PROJECT

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

```
Analyst:                 KT
Agency/Co.:              WOC
Date Performed:          4/3/2006
Analysis Time Period:    AM Peak Period
Intersection:            Front St/Hotel
Jurisdiction:            Lahaina, Maui
Units: U. S. Customary
Analysis Year:           Year 2010 w/project (Boat Day)
Project ID:  Lahaina Small Boat Harbor
East/West Street:        Hotel Street
North/South Street:      Front Street
Intersection Orientation: NS                Study period (hrs):  1.00
```

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	70	245			210	115
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	77	272			233	127
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT				TR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	77							
C(m) (vph)	1199							
v/c	0.06							
95% queue length	0.21							
Control Delay	8.2							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	46	319			324	83
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	51	354			360	92
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	51							
C(m) (vph)	1109							
v/c	0.05							
95% queue length	0.14							
Control Delay	8.4							
LOS	A							
Approach Delay								
Approach LOS								

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Hotel
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Hotel Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	60	294			173	98
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	66	326			192	108
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume						
Peak Hour Factor, PHF						
Hourly Flow Rate, HFR						
Percent Heavy Vehicles						
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes						
Configuration						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT							
v (vph)	66							
C(m) (vph)	1261							
v/c	0.05							
95% queue length	0.17							
Control Delay	8.0							
LOS	A							
Approach Delay								
Approach LOS								

```
                    HCS+: Unsignalized Intersections Release 5.2

_____________________TWO-WAY STOP CONTROL SUMMARY__________________________

Analyst:              KT
Agency/Co.:           WOC
Date Performed:       4/3/2006
Analysis Time Period: PM Peak Period
Intersection:         Front St/Hotel
Jurisdiction:         Lahaina, Maui
Units: U. S. Customary
Analysis Year:        Year 2010w/proj (Non Boat Day)
Project ID:  Lahaina Small Boat Harbor
East/West Street:     Hotel Street
North/South Street:   Front Street
Intersection Orientation: NS               Study period (hrs):  1.00

_____________________Vehicle Volumes and Adjustments________________________
Major Street:  Approach       Northbound              Southbound
               Movement     1       2       3    |  4       5       6
                            L       T       R    |  L       T       R
____________________________________________________________________________
Volume                      62      331                     327     93
Peak-Hour Factor, PHF       0.90    0.90                    0.90    0.90
Hourly Flow Rate, HFR       68      367                     363     103
Percent Heavy Vehicles      2       --      --              --      --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                          0    1                       1    0
Configuration                   LT                               TR
Upstream Signal?                    No                      No
____________________________________________________________________________
Minor Street:  Approach       Westbound               Eastbound
               Movement     7       8       9    |  10      11      12
                            L       T       R    |  L       T       R
____________________________________________________________________________
Volume
Peak Hour Factor, PHF
Hourly Flow Rate, HFR
Percent Heavy Vehicles
Percent Grade (%)                   0                       0
Flared Approach:  Exists?/Storage                /                       /
Lanes
Configuration
____________________________________________________________________________

________________Delay, Queue Length, and Level of Service____________________
Approach           NB    SB         Westbound              Eastbound
Movement           1     4    |  7      8      9     |  10      11      12
Lane Config        LT         |                      |
____________________________________________________________________________
v (vph)            68
C(m) (vph)         1095
v/c                0.06
95% queue length   0.20
Control Delay      8.5
LOS                 A
Approach Delay
Approach LOS
____________________________________________________________________________
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                    HCS+: Unsignalized Intersections Release 5.2

_____________________TWO-WAY STOP CONTROL SUMMARY__________________________

Analyst:              KT
Agency/Co.:           WOC
Date Performed:       4/3/2006
Analysis Time Period: AM Peak Period
Intersection:         Front St//Canal St
Jurisdiction:         Lahaina, Maui
Units: U. S. Customary
Analysis Year:        Year 2010 w/project (Boat Day)
Project ID:  Lahaina Small Boat Harbor
East/West Street:     Canal Street
North/South Street:   Front Street
Intersection Orientation: NS               Study period (hrs):  1.00

_____________________Vehicle Volumes and Adjustments________________________
Major Street:  Approach       Northbound              Southbound
               Movement     1       2       3    |  4       5       6
                            L       T       R    |  L       T       R
____________________________________________________________________________
Volume                              217                     176
Peak-Hour Factor, PHF               0.90                    0.90
Hourly Flow Rate, HFR               241                     195
Percent Heavy Vehicles              --      --              --      --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                               1                       1
Configuration                       T                       T
Upstream Signal?                    No                      No
____________________________________________________________________________
Minor Street:  Approach       Westbound               Eastbound
               Movement     7       8       9    |  10      11      12
                            L       T       R    |  L       T       R
____________________________________________________________________________
Volume                                              161             61
Peak Hour Factor, PHF                               0.90            0.90
Hourly Flow Rate, HFR                               178             67
Percent Heavy Vehicles                              2               2
Percent Grade (%)                   0                       0
Flared Approach:  Exists?/Storage                /                       /
Lanes                                                   1        1
Configuration                                            L       R
____________________________________________________________________________

________________Delay, Queue Length, and Level of Service____________________
Approach           NB    SB         Westbound              Eastbound
Movement           1     4    |  7      8      9     |  10      11      12
Lane Config                   |                      |  L               R
____________________________________________________________________________
v (vph)                                                 178             67
C(m) (vph)                                              578             846
v/c                                                     0.31            0.08
95% queue length                                        1.33            0.26
Control Delay                                           14.0            9.6
LOS                                                      B               A
Approach Delay                                                  12.8
Approach LOS                                                     B
____________________________________________________________________________
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HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		307			218	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		341			242	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				110		115
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				122		127
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						122		127
C(m) (vph)						475		797
v/c						0.26		0.16
95% queue length						1.03		0.57
Control Delay						15.2		10.4
LOS						C		B
Approach Delay							12.7	
Approach LOS							B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		326			148	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		362			164	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				78		30
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				86		33
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						86		33
C(m) (vph)						512		881
v/c						0.17		0.04
95% queue length						0.60		0.12
Control Delay						13.4		9.2
LOS						B		A
Approach Delay							12.3	
Approach LOS							B	

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TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St//Canal St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Canal Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		333			241	
Peak-Hour Factor, PHF		0.90			0.90	
Hourly Flow Rate, HFR		370			267	
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1			1	
Configuration		T			T	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				85		93
Peak Hour Factor, PHF				0.90		0.90
Hourly Flow Rate, HFR				94		103
Percent Heavy Vehicles				2		2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config						L		R
v (vph)						94		103
C(m) (vph)						441		772
v/c						0.21		0.13
95% queue length						0.81		0.46
Control Delay						15.4		10.4
LOS						C		B
Approach Delay							12.8	
Approach LOS							B	

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TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		166	33	61	162	
Peak-Hour Factor, PHF		0.86	0.86	0.88	0.88	
Hourly Flow Rate, HFR		193	38	69	184	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	29		70			
Peak Hour Factor, PHF	0.78		0.78			
Hourly Flow Rate, HFR	37		89			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		69		126				
C(m) (vph)		1081		481				
v/c		0.06		0.26				
95% queue length		0.20		1.06				
Control Delay		8.6		15.1				
LOS		A		C				
Approach Delay				15.1				
Approach LOS				C				

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_______________________TWO-WAY STOP CONTROL SUMMARY____________________________

Analyst:               KT
Agency/Co.:            WOC
Date Performed:        4/3/2006
Analysis Time Period: PM Peak Period
Intersection:          Front St/Prison St
Jurisdiction:          Lahaina, Maui
Units: U. S. Customary
Analysis Year:         Year 2010 w/project (Boat Day)
Project ID:  Lahaina Small Boat Harbor
East/West Street:      Prison Street
North/South Street:    Front Street
Intersection Orientation: NS              Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments__________________________
Major Street:  Approach        Northbound            Southbound
               Movement     1      2      3     |  4      5      6
                            L      T      R     |  L      T      R

-------------------------------------------------------------------------------
Volume                             263    81       70     224
Peak-Hour Factor, PHF              0.86   0.86     0.85   0.85
Hourly Flow Rate, HFR              305    94       82     263
Percent Heavy Vehicles             --     --       2      --     --
Median Type/Storage         Undivided            /
RT Channelized?
Lanes                              1      0           0      1
Configuration                         TR              LT
Upstream Signal?                   No                     No

-------------------------------------------------------------------------------
Minor Street:  Approach        Westbound             Eastbound
               Movement     7      8      9     |  10     11     12
                            L      T      R     |  L      T      R

-------------------------------------------------------------------------------
Volume                      53            51
Peak Hour Factor, PHF       0.88          0.88
Hourly Flow Rate, HFR       60            57
Percent Heavy Vehicles      2             2
Percent Grade (%)                  0                      0
Flared Approach:  Exists?/Storage         No    /                        /
Lanes                          0      0
Configuration                      LR

-------------------------------------------------------------------------------

_________________Delay, Queue Length, and Level of Service______________________
Approach         NB     SB        Westbound              Eastbound
Movement         1      4  |  7      8       9    |  10     11     12
Lane Config             LT |         LR           |

-------------------------------------------------------------------------------
v (vph)                 82           117
C(m) (vph)              919          311
v/c                     0.09         0.38
95% queue length        0.29         1.78
Control Delay           9.3          23.5
LOS                     A            C
Approach Delay                       23.5
Approach LOS                         C

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_______________________TWO-WAY STOP CONTROL SUMMARY____________________________

Analyst:               KT
Agency/Co.:            WOC
Date Performed:        4/3/2006
Analysis Time Period: AM Peak Period
Intersection:          Front St/Prison St
Jurisdiction:          Lahaina, Maui
Units: U. S. Customary
Analysis Year:         Year 2010w/proj (Non Boat Day)
Project ID:  Lahaina Small Boat Harbor
East/West Street:      Prison Street
North/South Street:    Front Street
Intersection Orientation: NS              Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments__________________________
Major Street:  Approach        Northbound            Southbound
               Movement     1      2      3     |  4      5      6
                            L      T      R     |  L      T      R

-------------------------------------------------------------------------------
Volume                             232    111      50     118
Peak-Hour Factor, PHF              0.90   0.90     0.90   0.90
Hourly Flow Rate, HFR              257    123      55     131
Percent Heavy Vehicles             --     --       2      --     --
Median Type/Storage         Undivided            /
RT Channelized?
Lanes                              1      0           0      1
Configuration                         TR              LT
Upstream Signal?                   No                     No

-------------------------------------------------------------------------------
Minor Street:  Approach        Westbound             Eastbound
               Movement     7      8      9     |  10     11     12
                            L      T      R     |  L      T      R

-------------------------------------------------------------------------------
Volume                      109           99
Peak Hour Factor, PHF       0.90          0.90
Hourly Flow Rate, HFR       121           110
Percent Heavy Vehicles      2             2
Percent Grade (%)                  0                      0
Flared Approach:  Exists?/Storage         No    /                        /
Lanes                          0      0
Configuration                      LR

-------------------------------------------------------------------------------

_________________Delay, Queue Length, and Level of Service______________________
Approach         NB     SB        Westbound              Eastbound
Movement         1      4  |  7      8       9    |  10     11     12
Lane Config             LT |         LR           |

-------------------------------------------------------------------------------
v (vph)                 55           231
C(m) (vph)              976          417
v/c                     0.06         0.55
95% queue length        0.18         3.59
Control Delay           8.9          24.2
LOS                     A            C
Approach Delay                       24.2
Approach LOS                         C

-------------------------------------------------------------------------------
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HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		259	57	78	235	
Peak-Hour Factor, PHF		0.83	0.83	0.86	0.86	
Hourly Flow Rate, HFR		312	68	90	273	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	45		77			
Peak Hour Factor, PHF	0.76		0.76			
Hourly Flow Rate, HFR	59		101			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		90		160				
C(m) (vph)		954		349				
v/c		0.09		0.46				
95% queue length		0.31		2.47				
Control Delay		9.2		24.0				
LOS		A		C				
Approach Delay				24.0				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	49	87	27	34	104	38
Peak-Hour Factor, PHF	0.87	0.87	0.87	0.70	0.70	0.70
Hourly Flow Rate, HFR	56	99	31	48	148	54
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	59	81	3	14	67	62
Peak Hour Factor, PHF	0.80	0.80	0.80	0.75	0.75	0.75
Hourly Flow Rate, HFR	73	101	3	18	89	82
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	56	48		177			189	
C(m) (vph)	1370	1439		507			698	
v/c	0.04	0.03		0.35			0.27	
95% queue length	0.13	0.10		1.59			1.11	
Control Delay	7.7	7.6		15.9			12.1	
LOS	A	A		C			B	
Approach Delay				15.9			12.1	
Approach LOS				C			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	103	47	12	19	59	35
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.83	0.83	0.83
Hourly Flow Rate, HFR	117	53	13	22	71	42
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	9	106	4	32	257	124
Peak Hour Factor, PHF	0.73	0.73	0.73	0.88	0.88	0.88
Hourly Flow Rate, HFR	12	145	5	36	292	140
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	117	22		162			468	
C(m) (vph)	1476	1530		543			696	
v/c	0.08	0.01		0.30			0.67	
95% queue length	0.26	0.04		1.27			5.86	
Control Delay	7.6	7.4		14.4			20.6	
LOS	A	A		B			C	
Approach Delay				14.4			20.6	
Approach LOS				B			C	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	74	9	14	20	139	65
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	82	10	15	22	154	72
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	42	141	4	12	64	49
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	46	156	4	13	71	54
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	82	22		206			138	
C(m) (vph)	1338	1576		657			809	
v/c	0.06	0.01		0.31			0.17	
95% queue length	0.20	0.04		1.36			0.62	
Control Delay	7.9	7.3		13.0			10.4	
LOS	A	A		B			B	
Approach Delay				13.0			10.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Prison Street
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Wainee Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	40	70	32	12	45	29
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.83	0.83	0.83
Hourly Flow Rate, HFR	51	90	41	14	54	34
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	54	145	2	21	254	10
Peak Hour Factor, PHF	0.80	0.80	0.80	0.86	0.86	0.86
Hourly Flow Rate, HFR	67	181	2	24	295	11
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	51	14		250			330	
C(m) (vph)	1508	1454		712			757	
v/c	0.03	0.01		0.35			0.44	
95% queue length	0.10	0.03		1.61			2.29	
Control Delay	7.5	7.5		12.8			13.4	
LOS	A	A		B			B	
Approach Delay				12.8			13.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	80	980	1		807	76
Peak-Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	88	1088	1		896	84
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	1		2	98
Peak Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	0	0	1		2	108
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	88			1				110
C(m) (vph)	704			446				518
v/c	0.13			0.00				0.21
95% queue length	0.43			0.01				0.81
Control Delay	10.8			13.1				13.8
LOS	B			B				B
Approach Delay				13.1			13.8	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	59	1097	4		1029	51
Peak-Hour Factor, PHF	0.93	0.93	0.93		0.90	0.90
Hourly Flow Rate, HFR	63	1179	4		1143	56
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	2		9	103
Peak Hour Factor, PHF	0.50	0.50	0.50		0.80	0.80
Hourly Flow Rate, HFR	0	0	4		11	128
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	63			4				139
C(m) (vph)	582			400				271
v/c	0.11			0.01				0.51
95% queue length	0.36			0.03				3.02
Control Delay	11.9			14.1				32.1
LOS	B			B				D
Approach Delay				14.1			32.1	
Approach LOS				B			D	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Yera 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	104	1097	0		681	86
Peak-Hour Factor, PHF	0.95	0.95	0.95		0.92	0.92
Hourly Flow Rate, HFR	109	1154	0		740	93
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	TWLTL		/ 1			
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	1		1	22
Peak Hour Factor, PHF	0.90	0.90	0.90		0.60	0.60
Hourly Flow Rate, HFR	0	0	1		1	36
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	109			1				37
C(m) (vph)	800			413				602
v/c	0.14			0.00				0.06
95% queue length	0.47			0.01				0.20
Control Delay	10.2			13.7				11.4
LOS	B			B				B
Approach Delay				13.7			11.4	
Approach LOS				B			B	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Honoapiilani Hwy/Prison St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Prison Street
North/South Street: Honoapiilani Hwy
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	30	1127	3		1067	54
Peak-Hour Factor, PHF	0.90	0.90	0.90		0.90	0.90
Hourly Flow Rate, HFR	33	1252	3		1185	60
Percent Heavy Vehicles	2	--	--		--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes	1	1	0		1	0
Configuration	L		TR			TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	0	0	3		2	101
Peak Hour Factor, PHF	0.90	0.90	0.90		0.60	0.60
Hourly Flow Rate, HFR	0	0	3		3	168
Percent Heavy Vehicles	2	2	2		2	2
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0		1	0
Configuration		LTR				TR

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	L			LTR				TR
v (vph)	33			3				171
C(m) (vph)	559			367				379
v/c	0.06			0.01				0.45
95% queue length	0.19			0.02				2.41
Control Delay	11.8			14.9				22.2
LOS	B			B				C
Approach Delay				14.9			22.2	
Approach LOS				B			C	

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		211	55	56	274	
Peak-Hour Factor, PHF		0.95	0.95	0.87	0.87	
Hourly Flow Rate, HFR		222	57	64	314	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage		Undivided		/		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	44		33			
Peak Hour Factor, PHF	0.72		0.72			
Hourly Flow Rate, HFR	61		45			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		64		106				
C(m) (vph)		873		542				
v/c		0.07		0.20				
95% queue length		0.24		0.73				
Control Delay		9.4		13.3				
LOS		A		B				
Approach Delay				13.3				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		296	49	62	357	
Peak-Hour Factor, PHF		0.92	0.92	0.90	0.90	
Hourly Flow Rate, HFR		321	53	68	396	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	58		39			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	77		52			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		68		129				
C(m) (vph)		504		359				
v/c		0.13		0.36				
95% queue length		0.47		1.66				
Control Delay		13.3		20.6				
LOS		B		C				
Approach Delay				20.6				
Approach LOS				C				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: AM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		273	36	20	248	
Peak-Hour Factor, PHF		0.80	0.80	0.74	0.74	
Hourly Flow Rate, HFR		341	44	27	335	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	26		33			
Peak Hour Factor, PHF	0.85		0.85			
Hourly Flow Rate, HFR	30		38			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No	/		/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		27		68				
C(m) (vph)		889		685				
v/c		0.03		0.10				
95% queue length		0.09		0.33				
Control Delay		9.2		10.8				
LOS		A		B				
Approach Delay				10.8				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

TWO-WAY STOP CONTROL SUMMARY

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/3/2006
Analysis Time Period: PM Peak Period
Intersection: Front St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Front Street
Intersection Orientation: NS Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		292	57	80	361	
Peak-Hour Factor, PHF		0.88	0.88	0.97	0.97	
Hourly Flow Rate, HFR		331	64	82	372	
Percent Heavy Vehicles		--	--	2	--	--
Median Type/Storage	TWLTL			/ 1		
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	58		45			
Peak Hour Factor, PHF	0.95		0.95			
Hourly Flow Rate, HFR	61		47			
Percent Heavy Vehicles	2		2			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			/
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		82		106				
C(m) (vph)		776		495				
v/c		0.11		0.22				
95% queue length		0.35		0.83				
Control Delay		10.2		14.3				
LOS		B		B				
Approach Delay				14.3				
Approach LOS				B				

HCS+: Unsignalized Intersections Release 5.2

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	38	55	22	48	70	26	15	147	21	8	116	48
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.79		0.82		0.86		0.76	
Flow Rate	144		174		211		225	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	144		174		211		225	
Left-Turn	48		58		17		10	
Right-Turn	27		31		24		63	
Prop. Left-Turns	0.3		0.3		0.1		0.0	
Prop. Right-Turns	0.2		0.2		0.1		0.3	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.0		-0.0		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	144		174		211		225	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13		0.15		0.19		0.20	
hd, final value	5.31		5.26		5.09		4.97	
x, final value	0.21		0.25		0.30		0.31	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	3.3		3.3		3.1		3.0	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	144		174		211		225	
Service Time	3.3		3.3		3.1		3.0	
Utilization, x	0.21		0.25		0.30		0.31	
Dep. headway, hd	5.31		5.26		5.09		4.97	
Capacity	394		424		461		475	
Delay	9.74		10.06		10.24		10.20	
LOS	A		B		B		B	
Approach:								
Delay	9.74		10.06		10.24		10.20	
LOS	A		B		B		B	

Intersection Delay 10.09 Intersection LOS B

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010 w/project (Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	62	77	28	140	83	7	15	234	44	18	254	53
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.81		0.83		0.96		0.87	
Flow Rate	205		276		303		371	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	205		276		303		371	
Left-Turn	76		168		15		20	
Right-Turn	34		8		45		60	
Prop. Left-Turns	0.4		0.6		0.0		0.1	
Prop. Right-Turns	0.2		0.0		0.1		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj		0.2		0.2		0.2		0.2
hRT-adj		-0.6		-0.6		-0.6		-0.6
hHV-adj		1.7		1.7		1.7		1.7
hadj, computed	0.0		0.1		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	205		276		303		371	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.18		0.25		0.27		0.33	
hd, final value	6.85		6.76		6.40		6.24	
x, final value	0.39		0.52		0.54		0.64	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.8		4.8		4.4		4.2	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	205		276		303		371	
Service Time	4.8		4.8		4.4		4.2	
Utilization, x	0.39		0.52		0.54		0.64	
Dep. headway, hd	6.85		6.76		6.40		6.24	
Capacity	451		482		516		543	
Delay	14.21		16.99		16.81		20.32	
LOS	B		C		C		C	
Approach:								
Delay	14.21		16.99		16.81		20.32	
LOS	B		C		C		C	

Intersection Delay 17.52 Intersection LOS C

HCS+: Unsignalized Intersections Release 5.2

:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: AM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	20	43	11	38	38	2	11	142	47	10	93	23
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.68		0.98		0.78		0.81	
Flow Rate	108		78		256		154	
% Heavy Veh	2		2		2		2	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	108		78		256		154	
Left-Turn	29		38		14		12	
Right-Turn	16		2		60		28	
Prop. Left-Turns	0.3		0.5		0.1		0.1	
Prop. Right-Turns	0.1		0.0		0.2		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.0		0.1		-0.1		-0.1	

HCS+: Unsignalized Intersections Release 5.2

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: KT
Agency/Co.: WOC
Date Performed: 4/4/2006
Analysis Time Period: PM Peak Period
Intersection: Wainee St/Dickenson St
Jurisdiction: Lahaina, Maui
Units: U. S. Customary
Analysis Year: Year 2010w/proj (Non Boat Day)
Project ID: Lahaina Small Boat Harbor
East/West Street: Dickenson Street
North/South Street: Wainee St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	63	74	19	100	81	20	24	236	38	21	250	81
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.85		0.91		0.92		0.90	
Flow Rate	183		219		323		390	
% Heavy Veh	2		2		2		2	
No. Lanes		1		1		1		1
Opposing-Lanes		1		1		1		1
Conflicting-lanes		1		1		1		1
Geometry group		1		1		1		1
Duration, T 1.00 hrs.								

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	183		219		323		390	
Left-Turn	74		109		26		23	
Right-Turn	22		21		41		90	
Prop. Left-Turns	0.4		0.5		0.1		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group		1		1		1		1
Adjustments Exhibit 17-33:								
hLT-adj		0.2		0.2		0.2		0.2
hRT-adj		-0.6		-0.6		-0.6		-0.6
hHV-adj		1.7		1.7		1.7		1.7
hadj, computed	0.0		0.1		-0.0		-0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	108		78		256		154	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.10		0.07		0.23		0.14	
hd, final value	4.98		5.15		4.49		4.64	
x, final value	0.15		0.11		0.32		0.20	
Move-up time, m		2.0		2.0		2.0		2.0
Service Time	3.0		3.1		2.5		2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	108		78		256		154	
Service Time	3.0		3.1		2.5		2.6	
Utilization, x	0.15		0.11		0.32		0.20	
Dep. headway, hd	4.98		5.15		4.49		4.64	
Capacity	358		328		506		404	
Delay	8.86		8.79		9.59		8.79	
LOS	A		A		A		A	
Approach:								
Delay		8.86		8.79		9.59		8.79
LOS		A		A		A		A

Intersection Delay 9.15 Intersection LOS A

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	183		219		323		390	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.16		0.19		0.29		0.35	
hd, final value	6.67		6.60		6.03		5.85	
x, final value	0.34		0.40		0.54		0.63	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.7		4.6		4.0		3.8	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	183		219		323		390	
Service Time	4.7		4.6		4.0		3.8	
Utilization, x	0.34		0.40		0.54		0.63	
Dep. headway, hd	6.67		6.60		6.03		5.85	
Capacity	433		469		556		584	
Delay	13.08		14.01		16.10		18.81	
LOS	B		B		C		C	
Approach:								
Delay	13.08		14.01		16.10		18.81	
LOS	B		B		C		C	

Intersection Delay 16.14 Intersection LOS C

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: AM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Year 2010 w/project (Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	38	23	23	31	13	26	40	893	44	12	824	91
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			2			3			4			9

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	24.0					21.5	74.5		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	270	1520	0.34	0.18	49.3	D	49.3	D
Westbound								
LTR	268	1509	0.28	0.18	48.6	D	48.6	D
Northbound								
L	297	1863	0.15	0.16	49.1	D		
TR	1075	1948	0.96	0.55	48.2	D	48.2	D
Southbound								
L	297	1863	0.04	0.16	48.1	D		
TR	2032	3683	0.50	0.55	18.9	B	19.2	B

Intersection Delay = 35.2 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: PM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Year 2010 w/project (Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	59	31	27	34	21	26	28	1043	57	11	1031	185
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			3			3			6			19

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	27.0					11.0	82.0		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	279	1394	0.72	0.20	59.4	E	59.4	E
Westbound								
LTR	280	1401	0.34	0.20	47.1	D	47.1	D
Northbound								
L	152	1863	0.19	0.08	58.5	E		
TR	1183	1947	0.97	0.61	57.7	E	57.7	E
Southbound								
L	152	1863	0.08	0.08	57.5	E		
TR	2220	3655	0.61	0.61	16.9	B	17.3	B

Intersection Delay = 38.1 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: AM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Year 2010w/proj (Non Boat Day)
N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	40	28	11	27	19	37	17	1024	51	13	686	124
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			1			4			5			12

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	24.0					16.5	79.5		
Yellow	4.0					4.0	4.0		
All Red	1.0					1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	247	1389	0.51	0.18	52.0	D	52.0	D
Westbound								
LTR	270	1519	0.37	0.18	49.7	D	49.7	D
Northbound								
L	228	1863	0.08	0.12	52.7	D		
TR	1147	1948	0.96	0.59	53.0	D	53.0	D
Southbound								
L	228	1863	0.06	0.12	52.5	D		
TR	2152	3655	0.40	0.59	15.1	B	15.7	B

Intersection Delay = 38.0 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.2

Analyst: KT
Agency: WOC
Date: 4/4/2006
Period: PM Peak Period
Project ID: Lahaina Small Boat Harbor
E/W St: Dickenson Street

Inter.: Honoapiilani Hwy/Dickenson St
Area Type: All other areas
Jurisd: Lahaina, Maui
Year : Year 2010 w/proj(Non Boat Day)

N/S St: Honoapiilani Hwy

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	2	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	57	44	33	51	42	17	24	1023	80	15	1036	99
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			3			2			8			10

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru		A		
Right	A					Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru		A		
Right	A					Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	26.0						12.5	81.5		
Yellow	4.0						4.0	4.0		
All Red	1.0						1.0	1.0		

Cycle Length: 135.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	264	1370	0.67	0.19	57.2	E	57.2	E
Westbound								
LTR	252	1307	0.56	0.19	52.3	D	52.3	D
Northbound								
L	172	1863	0.15	0.09	56.7	E		
TR	1172	1941	0.97	0.60	58.0	E	58.0	E
Southbound								
L	172	1863	0.10	0.09	56.3	E		
TR	2227	3689	0.57	0.60	16.5	B	17.0	B

Intersection Delay = 38.7 (sec/veh) Intersection LOS = D

APPENDIX G.

Site Location Alternatives Capital Costs Summary

Lahaina SBH Ferry Pier Improvements Quantity Takeoff and Cost Estimate

Prepared by: E. Yuasa, Engineering Division

Date: August 24, 2005

Quantity Take-off:

New concrete pier and walkway structures

Concrete walkway approximately 60 feet X 16 feet wide (960 SF)
Support piles: Assume 12 piles (based on concept plan dated 12-27-04)

Concrete Pier approximately 115 feet X 35 feet wide (4,025 SF)
Support piles: Assume 88 piles (based on concept plan dated 12-27-04)

Dredging of entrance channel and turning basin approximately 2,500 CY

Covered Waiting Area: 25' X 100' = 2,500 SF

Administrative Office: 15' X 35' = 525 SF

Cost Estimate:

Item	Quantity	Unit Cost	Total
Mobilization and demobilization	LS		300,000
Demolition existing pier structure	740 SF	50	37,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
Concrete walkway and pier:			
Concrete piles	100 Each	20,000	2,000,000
Concrete walkway	960 SF	300	288,000
Concrete pier	4,025 SF	350	1,408,750
Sewer pump out	2 Each	5,000	10,000
3.5 hp grinder sewer pump station	LS	25,000	25,000
Force main from pump out to pump station	300 LF	60	18,000
Sewer lateral from pump station to County sewer system	200 LF	120	24,000
Sewer manholes	2 Each	7,000	14,000
3" Waterline	200	120	24,000
Fire hydrants	2	5,000	10,000
3/4" Waterline and hose bibs	70	80	5,600
Relocate fire system cabinet	LS		3,000

Item	Quantity	Unit Cost	Total
Drainage system	LS		30,000
Electrical upgrades	LS		250,000
Ferry terminal building	2,500 SF	200	500,000
New ferry office	100 SF	250	25,000
Administrative office	525 SF	500	262,500
Surfer access	LS		30,000
Vehicle and pedestrian traffic improvements	LS		245,650
Construction contingency (10%)			576,050
Planning work	LS		600,000
Design work	LS		600,000
Construction management	LS		576,050
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
Total			8,292,600

Mala Wharf Quantity Takeoff and Cost Estimate

Quantity Take-off:

New concrete pier and walkway structures

Concrete walkway approximately 392 feet X 16 feet wide (6,272 SF)
Support piles: Assume pair of piles located every 10 feet, 392 feet divided by 10 feet O.C. = 39 piles X 2 = 78 piles

Concrete Pier approximately 110 feet X 35 feet wide (3,850 SF)
Support piles: Assume 4 piles located every 10 feet, 110 feet divided by 10 feet O.C. = 11 piles X 4 = 44 piles

Dredging of entrance channel and turning basin approximately 2,500 CY

North Parking lot: 277' X 120' = 33,240 SF
South Parking lot: 120' X 100' = 12,000 SF
Total 45,240 SF or 838 CY
Assume 6" concrete pavement and 6" basecourse

Existing parking lot: 250' X 100' + 100' X 52' = 30,200 SF

Cost Estimate

Item	Quantity	Unit Cost	Total
Demolition of existing wharf structure and dredging:			
Mobilization and demobilization	LS		300,000
Demolition	34,900 SF	30	1,047,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
			0
Concrete walkway and pier:			0
Concrete piles	122 Each	20,000	2,440,000
Concrete walkway	6,272 SF	300	1,881,600
Concrete pier	3,850 SF	350	1,347,500
			0
Sewer pump out	LS		30,000
Sewer pump station	LS	31,000	31,000
Force main from pump out to pump station	600 LF	60	36,000
Sewer lateral from pump station to County sewer system	1,000 LF	80	80,000
Sewer manholes	3 Each	7,000	21,000
			0
New parking lots (North and South)	838 CY	280	234,640
Repave existing parking lot	30,200 SF	10	302,000

Item	Quantity	Unit Cost	Total
Roadway entrance improvements	LS		200,000
8" Waterline	1,500	150	225,000
Fire hydrants	3	5,000	15,000
Electrical upgrades	LS		250,000
Ferry terminal building	1,000 SF	500	500,000
Construction contingency (10%)			910,000
			0
Planning work	LS		600,000
Design work	LS		900,000
Construction management	LS		900,000
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
Total			12,680,740

Kekaa Point Quantity Takeoff and Cost Estimate

Quantity Take-off:

New concrete pier

Concrete Pier approximately 110 feet X 35 feet wide (3,850 SF)
Support piles: Assume 4 piles located every 10 feet, 110 feet divided by 10 feet O.C. = 11 piles X 4 = 44 piles

Dredging of entrance channel and turning basin approximately 2,500 CY

Road side parking: 400' X 20' = 8,000 SF
Access road: 1,000' X 24' = 24,000 SF
Cul-de-sac: 65' x 65' X 3.14 = 13,273 SF
Concrete walkways: 550' X 10' = 5,500 SF
Total 50,773 SF or 940 CY
Assume 6" concrete pavement and 6" basecourse

New Parking garage: 340' X 92' = 31,280 SF

New Breakwater: 550' X 12'

Cost Estimate

Item	Quantity	Unit Cost	Total
Demolition of existing pier structure and dredging:			
Mobilization and demobilization	LS		300,000
Demolition	LS		250,000
Dredging turning basin and entrance channel	2,500 CY	100	250,000
North breakwater	550'	5,000	2,750,000
Concrete piles	44 Each	20,000	880,000
Concrete pier	3,850 SF	350	1,347,500
Sewer pump out	LS		30,000
Sewer pump station	LS	31,000	31,000
Force main from pump out to pump station	600 LF	60	36,000
Sewer lateral from pump station to private sewer system	1,000 LF	80	80,000
Sewer manholes	3 Each	7,000	21,000
New parking, roadway and walkways (6" conc. on 6" basecourse)	940 CY	280	263,200
Roadway entrance improvements	LS		200,000
8" Waterline	1,500	150	225,000

Item	Quantity	Unit Cost	Total
Fire hydrants	3	5,000	15,000
Electrical upgrades	LS		250,000
Ferry terminal building	1,400 SF	250	350,000
Parking garage	LS		2,000,000
New bridge over drainage canal	LS		250,000
Construction contingency (10%)			953,000
Planning work	LS		1,200,000
Design work	LS		1,000,000
Construction management	LS		930,000
Staff services	LS		150,000
Archaeological monitoring	LS		30,000
Land acquisition and easements	LS		5,000,000
Total			18,791,700

APPENDIX H.

Mala Wharf Marine Species List

Attachment 1.

MALA WHARF	5-Jul-05	TIME: 10:20-11:03
FAMILY	**FISH NAME**	**Fork Length (cm.)**
Pomacentridae	Abudefduf abdominalis	3-10
Pomacentridae	Abudefduf sordidus	15
Pomacentridae	Abudefduf vaigiensis	5
Acanthuridae	Acanthurus achilles	13
Acanthuridae	Acanthurus dussumieri	36
Acanthuridae	Acanthurus leucoparieus	13-20
Acanthuridae	Acanthurus nigrofuscus	10-13
Acanthuridae	Acanthurus olivaceus	20
Tetraodontidae	Arothron meleagris	15-36
Atherinidae	Atherinomorus insularum	5-6
Aulostomidae	Aulostomus chinensis	30
Scaridae	Calotomus carolinus	40-50
Carangidae	Caranx melampygus	20
Serranidae	Cephalopholis argus	61+
Chaetodontidae	Chaetodon auriga	13
Chaetodontidae	Chaetodon lunula	10
Chaetodontidae	Chaetodon lunulatus	10
Chaetodontidae	Chaetodon miliaris	3-5
Chaetodontidae	Chaetodon ornatissimus	15-18
Chaetodontidae	Chaetodon quadrimaculatus	10
Pomacentridae	Chromis ovalis	8
Pomacentridae	Chromis vanderbilti	<3
Pomacentridae	Dascyllus albisella	5
Carangidae	Decapterus macarellus	20
Fistulariidae	Fistularia commersonii	100-120
Chaetodontidae	Forcipiger flavissimus	13-15
Labridae	Gomphosus varius	15
Labridae	Halichoeres ornatissimus	15-18
Lutjanidae	Lutjanus fulvus	15
Balistidae	Melichthys niger	20
Mullidae	Mulloidichthys flavolineatus	30
Mullidae	Mulloidichthys vanicolensis	25-30
Acanthuridae	Naso brevirostris	25
Acanthuridae	Naso lituratus	18
Acanthuridae	Naso unicornis	30-41
Cirrhitidae	Paracirrhites fosteri	13
Mullidae	Parupeneus bifasciatus	20
Mullidae	Parupeneus cyclostomus	13
Mullidae	Parupeneus multifasciatus	18-20
Mullidae	Parupeneus porphyreus	3-15
Belonidae	Platybelone argalus	25-36
Balistidae	Rhinecanthus rectangulus	18-20
Scaridae	Scarus psittacus	25
Pomacentridae	Stegastes fasciolatus	5-10
Labridae	Stethojulis balteata	3-13
Labridae	Thalassoma duperrey	5-13
Labridae	Thalassoma trilobatum	15
Mullidae	Upeneus arge	25
Zanclidae	Zanclus cornutus	13

APPENDIX H-1.

Keka`a Marine Species List

Attachment 2.

Keka'a (Ka'anapali)	5-Jul-05	TIME: 12:30-13:10
FAMILY	**FISH NAME**	**Fork Length (cm.)**
Pomacentridae	Abudefduf abdominalis	8
Pomacentridae	Abudefduf sordidus	10
Pomacentridae	Abudefduf vaigiensis	3-8
Acanthuridae	Acanthurus achilles	15
Acanthuridae	Acanthurus leucoparieus	10-15
Acanthuridae	Acanthurus nigrofuscus	10-15
Acanthuridae	Acanthurus triostegus	5-13
Labridae	Anapses cuvier	3-18
Scaridae	Calotomus carolinus	46-51
Carangidae	Caranx melampygus	15
Chaetodontidae	Chaetodon fremblii	5
Chaetodontidae	Chaetodon multicinctus	10
Pomacentridae	Chromis hanui	3
Pomacentridae	Chromis ovalis	10
Pomacentridae	Chromis vanderbilti	<3
Cirrhitidae	Cirrhitus pinnulatus	10
Acanthuridae	Ctenochaetus strigosus	10
Labridae	Halichoeres ornatissimus	10-15
Mullidae	Mulloidichthys flavolineatus	15-25
Acanthuridae	Naso unicornis	30
Ostraciidae	Ostracion meleagris	10
Mullidae	Parupeneus multifasciatus	15
Mullidae	Parupeneus porphyreus	13
Pomacentridae	Plectroglyphidodon johnstoniar	3
Balistidae	Rhinecanthus rectangulus	18
Pomacentridae	Stegastes fasciolatus	8
Labridae	Stethojulis balteata	13
Labridae	Thalassoma duperrey	13-15
Labridae	Thalassoma trilobatum	10
Zanclidae	Zanclus cornutus	13
Acanthuridae	Zebrasoma flavescens	15-18

APPENDIX I.

Lahaina Small Boat Harbor Ferry Pier and Comfort Station Improvements Stakeholders Meeting, April 8, 2004

LAHAINA SMALL BOAT HARBOR FERRY PIER AND COMFORT STATION PROJECT

STAKEHOLDER MEETING

ORIGINAL

Held at Lahainaluna Intermediate School, Lahaina, Maui, Hawaii, commencing at 7:00 p.m. on April 8, 2004.

REPORTED BY: LYNANN NICELY, RPR/RMR/CSR #354

MR. THOMPSON: Okay. We're going to go ahead and get started. My name is Steve Thompson, I'm the acting administrator for the Department of Land and Natural Resources, Division of Boating and Ocean Recreation. We're here tonight to talk about a proposed project to make some improvements to the Lahaina Harbor, specifically an additional new proposed pier for the ferries and a significant improvement to the comfort station.

First I would like to introduce a couple of honored guests from our legislative branch. We have Council Member Joanne Johnson. Thank you for coming, appreciate you taking the time. Leslie Couch is representing Representative Brian Blundell.

MS. COUCH: And I have a message from Representative Blundell to let you know that he will remain -- even though he couldn't be here tonight, he is going to remain very much involved in the whole process.

MR. THOMPSON: I know he's been in communication with our office already about it. And I believe Donald Couch is here representing Mayor Arakawa. Okay. Thank you. And Kyle Ginoza, the director of the Maui County Department of Transportation.

We have Mr. Eric Yuasa, he's the project engineer from DLNR. He's the person that knows the most about this project. And we have a consultant team of Steve Wong and Jong Namgung from Mitsunaga & Associates. And we have Mike Munekiyo and Glenn Tadaki.

On behalf of the chairperson of the Department of Land and Natural Resources, Peter Young, we would like to thank you for taking time off from your busy schedules to come tonight and to meet with us and to be a part of the planning team. We're here tonight to hear from everyone and to try to be sure that all of your concerns and comments are taken into consideration as this planning for this project continues. Like I said earlier, it is for a ferry pier and a comfort station.

We need to emphasize that this project is in the planning phase and that we do not at any time have any design or construction money. So we right now have an appropriation pending at the legislature for just the comfort station, but we have federal monies available with the appropriate state match for the ferry pier and the comfort station. So there is actually two ways we may be able to fund an improvement to the comfort station and using the ferry

monies, a way to create a new ferry pier. So we have to seek that federal funding after the planning phase. And the federal funding will also help pay for the planning.

You're going to see conceptual plans tonight and they by no means are finalized. They're very preliminary and part of why we're here tonight is to find out what you like or don't like, what we did right or what we did wrong, so that you can help us make this plan fit the community. Later on you'll have an opportunity to provide us your comments and we would like you to do that very freely. We do have a reporter here to take down your notes so that we won't miss them and we can refer back to them later.

The existing pier down at the harbor is used by both recreational and commercial boats, cruise ship tenders, and ferries. Today is "boat day" and on boat day we all know it's one of the busiest harbor if not the busiest harbor in the state. Lots of congestion, lots of activities.

We have both of the ferry operators represented here tonight and I think they will tell you that there have been times where they have been unable to load or unload their passengers in a timely manner because of the amount of activity at the harbor.

We have a lot of different activities all going on in that one little spot. We have the fueling station, we have the sewage pump out, we've got the surfers, we've got the cruisers, the recreational guys, we've got the commercial operators, and we have the ferries, and on certain days like today we have the cruise ship operators. So there is clearly a lot going on in that limited space.

Also, the existing bathroom or comfort station is inadequate and in disrepair and does not meet American with Disability Act guidelines and we are required to make them come within compliance with the ADA.

The existing comfort station is 15 feet by 25 feet and approximately 375 square feet. It has two sinks, two toilets, and two urinals on the men's side; two sinks and three toilets on the women's side. The proposal that you see tonight can only accommodate the local community but also the increased activity due to the ferries, would make the women's side have nine toilets and the men's side have six stalls and three urinals.

The federal funding that is available is from the Federal Transit Administration. They have

actually -- were here in the past and are very favorable in terms of considering authorizing federal funds for this project. They have also recently travelled in the last couple of weeks with us to the island of Lanai, looking at what the improvements could be made there, and they're also considering improvements to Kaunakakai.

Federal Transit Administration -- the acronym is FTA. So if you hear FTA tonight, those are the federal folks that have the grant money. The ratio is 4 to 1, so the state puts in -- for every dollar the state puts in, the federals will match it with four. The state's share is from an Appropriation Act 259, session laws 2001. We've got all kinds of complicated stuff in here. But it provides $20,000 for the comfort station on the state side.

After the planning, we would apply for the money from the FTA for design and construction. FTA has already earmarked $25 million to support ferry operations in Hawaii: $5 million in fiscal year 2003, $10 million in fiscal year 2004, and another $10 million in fiscal year 2005. That's quite a bit of money and something that we wouldn't want to pass by. The federal folks told us that if the State of Hawaii doesn't make use of it, Alaska is chomping at the bit for it.

Some of the money in Hawaii is actually going to improve the ferries that take people out to the Arizona Memorial. It's unrelated to the DLNR, but it is part of that federal appropriation.

Now I would like to turn it over to Eric Yuasa, who is a design engineer with the Department of Land and Natural Resources and he can actually tell you about some of the guts of the program. And then after the engineers and the consultants are done explaining things, we'll give you guys an opportunity to comment back with us. Thank you.

MR. YUASA: Thank you, Steve. Again, my name is Eric Yuasa and I'm the project manager for this project.

Right now we want to emphasize that we're in the planning phase only. And again, there is no design or construction money available for the project. But what we do is we hope to seek I guess Federal Transit Administration funding after the planning phase is completed.

Right now the planning phase consists of preparation of conceptual plans, the environmental impact statement, and the necessary permits for the project. Some of the permits include the Special

Management Area Use Permit, the Shoreline Setback Variance Approval, Historic District Approval Application, Conservation District Use Application, Department of Army Permit, Water Quality Certification, and a Coastal Zone Management Consistency Certification.

Okay. Right now we're up against a real stringent deadline in order to qualify for the FTA funding. We need to complete the planning phase by April 2005. So right now we have basically one year to complete an EIS in order to qualify for the $10 million in Federal Transit Administration funding that becomes available October 1st, 2005.

Right now I would like to introduce Steve Wong from Mitsunaga & Associates. Mitsunaga & Associates are our consultant for the planning phase portion. And he would like to I guess go over some of the conceptual plans that he's come up with. And these conceptual plans are based on I guess watching the operations at the pier on the peak boat days and talking to I guess some of the harbor agents and people I guess that use some of the commercial pier -- commercial and recreational pier.

MR. WONG: I'm Steve Wong, I'm the architect on this project for Mitsunaga & Associates. We do have a structural engineer here.

I'm going to show you again some very conceptual planning plans. It's just -- it's my idea, looking at Lahaina and that, but you know as the community, I consider this like a mini-charette. Architects like to do that, they like to hold these mini design charettes and actually get your -- you know, when you're designing a house, to get your ideas on this. So this is just a starting point. It's only on paper. Not nothing is set. We'd like to hear your comments. You could tell us go jump in the lake or whatever, but we'll show you some -- I have two schemes. If you have any questions, please feel free to bring up the question.

Sheet 1. Okay. This is a plan view. What this shows is this is highlighting a -- this is the existing pier right now. And the Carthaginian is on this side. The existing pier. What this plan shows is the new pier and a small multi-purpose pier. There are no impacts to the land. What we're doing is we're having a gangway after that new pier out to this multi-purpose pier. And it's a small pier, it's 15 feet wide by 90 feet long. It's like a floating dock. I guess what it can be used here is maybe a historical canoe or a surfer access for this pier. This is not

the ferry pier.

This is the ferry pier and we'll go to that now. Okay. This is just scheme 1. This is just a simple ferry pier, but it's 48 feet wide by 146 feet long. So it's about the same -- about the same length as the existing pier.

You see these boats here. This is an accessible ramp coming down. This is scheme 1. We have a more -- we have a more elaborate scheme which we'll show now. Based on other agencies and, you know, other requirements. This is like a two-story scheme. This is the first floor where the ferry would dock. Passenger arrival area. There is a second floor, administrative office, rest room, concession space.

What I tried to do here conceptually is to be aware of the cultural and the rich history of Lahaina Town, the design, and it's a similar design to Pioneer Inn. You can tell by the French doors, the double pitched roof, the gable. The materials used is like the roughsawn lumber, that kind of thing. The colors of Lahaina. There is an elevator for handicap accessibility. Janitor closet. Public restrooms on the second floor. There is a complete walking deck around it. Stairways down. Exits. So that's the more elaborate scheme, the two-story scheme.

And lastly, this is the new comfort station. What is envisioned is actually deleting the old comfort station and actually building a new one, a bigger comfort station with more water closets. As you can see, the women have a lot of water closets, lavs, and a men's side. And it's a similar design, the double-pitched roof.

This is like a site plan. And a few more parking stalls for accessibility. It will be all completely accessible once we get into the design. More green space around it.

VOICE: Where is the existing rock wall?

MR. WONG: It's kind of -- you mean on the ocean side?

VOICE: And the side as well. Where the coconut trees are.

MR. WONG: We have an existing plan, so --

MR. YUASA: We have a court reporter, so we would ask if you could come up and identify yourself if you have any questions.

MR. COUCH: I'm Don Couch, asking for the mayor. Where is the existing rock wall for the comfort station? What are you going to have to take down as far as trees and rock walls?

MR. WONG: We're trying to put it in the same envelope as -- same envelope as the existing, and then come out, come out towards the, what you call it, the Kaanapali side. So it will be kind of the same envelope. Hopefully we don't have to demolish any rock walls. It's like on the same footprint and then come out this way. So it won't touch that rock wall.

So basically that's what -- as the architect, actually most of the pier is like a structural job. What I've been retained to do is try to add a few more architectural features into the plan so it fits into the environment. And what we would like -- we would appreciate your comments. And that's it.

MS. COUCH: Thank you. Leslie Couch for Representative Blundell.

How much dredging do you anticipate doing for this?

MR. WONG: How much dredging will be required to construct this facility?

MR. NAMGUNG: Unfortunately, we cannot tell you the quantity of the dredging. Right now the survey is going on. We saw the map, this harbor map area, area map, about 15 years old. We have 10 years old, 20 years old survey maps that are 10 feet different ocean bottom. So every time they have hurricane, they're putting in the sand, after that push out. So we don't know what is condition right now. So we can tell you based on after I finish the survey.

MS. COUCH: And how many boats at this particular point do you think will be able to fit into the piers as far as how many ferries, how many tenders? Can two ferry boats fit into there at the same time?

MR. NAMGUNG: There is one -- one boat can stay. So this one here. And there is one more this side. And possibly one more other side. This is the new ferry pier we're proposing. So two or three.

MS. COUCH: And the Carthaginian would be on the other side of the multipurpose pier?

MR. THOMPSON: Yeah, I want to try to make that a little clearer. This is the existing pier. This is the proposed new ferry pier. And this pier here is proposed to accommodate the replacement vessel for the Carthaginian. And this is now the accessway to the Carthaginian. I know when I saw this drawing, I assumed that this would be gone, okay. So this would be an existing operator and you could put one on either side.

The issue of -- your question about dredging,

we believe that the original dredge includes the area of this pier. It may not extend out this far. And so one of the ways to mitigate having to dredge or how much you have to dredge is to make that a floating pier rather than a fixed pier. But then there is another concern with how much coverage it would get -- they don't have it on the drawing -- how much coverage or protection it would get from the breakwater out here. So you may have to have piles positioned fairly closely to accommodate a floating dock without protection.

Part of what I know I wanted to hear tonight or at least get a sense of is the community's concern or support or lack of support for trying to take care of this need.

So that we can get the notes, we would like you to come up so everyone can hear and then identify yourself so the reporter can get it.

MR. MOORE: Thank you. My name is Tom Moore and I have a boat down on the harbor since 1970 now and I've matched the first Carthaginian go up, I've matched the cruise ships arrive, and I have to say I'm dismayed this is even happening.

The Carthaginian to be stuck out on a little finger pier out here is just ridiculous. To suggest that dredging is not necessary is ridiculous. The Carthaginian breaks loose on its existing situation on a relatively stable platform. What's happening is that the cruise ships are moving in and shoving what we know as Lahaina out, plain and simple. And a little finger pier to support the Carthaginian will shove it back in the corner is just outrageous. I can't believe that this is even going on. And not to mention logistics, like just getting -- I live a couple blocks down from here. This is what you're creating here already with existing situation. It's log jam. You're bringing two more piers. Where is everybody going to park? Where are all the taxis going to go? And not to be too facetious, let's get rid of the Pioneer Inn, it's in the way. Need parking for the cruise -- you're turning Lahaina into a cruise ship terminal.

And I have been in other parts of the world like St. Thomas, they call it Charlotte Amalya. The locals call it Toilet Amalya because of the cruise ships. And the argument is that we need the economy, the tourist economy. This isn't going to aid Lahaina's tourist economy; it's going to destroy it. Thank you.

MR. THOMPSON: Thank you for your comments. I

do want to make very clear, though, that the funding source for this improvement cannot be tied to a cruise ship; it can only be tied to the ferries. So what we are looking at from our perspective right now is not any increase in activity, but simply a way to try to resolve some of the density or the user conflict all occurring at the one facility.

MR. MOORE: How can you say that?

MR. THOMPSON: If you'll let me finish. I'll answer whatever question you have.

MR. MOORE: It's not a question; it's a statement.

MR. THOMPSON: The pier would be paid for with federal funds earmarked specifically for ferries. It's a way to make an improvement to the facility at a 1-to-4 match, so we get a pretty good bang for our buck.

Everyone uses the bathroom. The bathroom is also a part of that project. I think that's a win-win. Your concerns are why we're here tonight. Especially the security of whatever the replacement boat is for the Carthaginian. I have been told -- I don't know if it's factual or not -- that it may be like a double hulled canoe like the Hokalea. But I know when I saw this, I was concerned about its protection, just I think like you're commenting. But our plan is not a way to bring in more cruise ships. I know that's a concern.

MR. MOORE: What is it for? You're turning it into a cruise ship terminal.

MR. THOMPSON: No, it's a way to -- it's like putting another lane on the road so that the traffic isn't --

MR. MOORE: Let the cruise ships build their own harbor like they do elsewhere. Believe me, boys and girls, it's going to ruin Lahaina.

MR. THOMPSON: I saw another hand. Yes, Greg. Can you come up and identify yourself, please?

MR. HOLLIS: Good evening, my name is Greg Hollis. I represent the Ocean Tourism Coalitión. And hearing what Tom is talking about, there is some concerns. I agree I think some dredging is going to have to take place, but I'm not so sure that that's a bad thing. We've been needing some dredging for a long time in the harbors and this may be an opportunity to get some of it.

But I would like to see that extended further into the harbor. We have an existing problem with boat turn arounds and things like that. By adding another pier, while I'm in support of a ferry

terminal, I think we've seem with the ferries going to Molokai are getting bigger, the ferries going to Lanai are getting bigger, I think that's a positive thing, it's better utilization for the residents on both Lanai and Molokai, for the services these two ferries are providing, and we do need to accommodate a place that they can land. And the existing pier is not sufficient to accommodate that and the existing harbor users.

But there is some other things that need to be done in conjunction with this so that we don't create a huge bottleneck right at the entrance of the harbor. One of the things that I would like to see added to this plan is to pave the existing break wall and make that so it's an accessible area so that you can better utilize the back row slips, those from, say, 45 to 99, and in that process when you are dredging the harbor, dredge the harbor such that say from slips 22 all the way around to 99 can be moved out against the break wall. You've got anywhere from 15 to 30 feet of wasted space that's currently where a catwalk is. You move the boats back. You don't necessarily increase the usage or anything else, you just give a little bit more berth inside the harbor for turning and accommodating the existing users. When you're in there dredging, take all of that into account at one time.

You also need to look at your ADA accessibility in the harbor and to the backside of the harbor as well. Currently I know that our finger piers and things like that are not ADA accessible and when we're doing any new projects, I think we need to give some prudence to that. I strongly support the ferry pier because I believe those are some things if I heard correctly are going to be addressed at that time. But you can't just focus on that one section because that's the bottleneck of our harbor. And you do a lot of build out and improvements in that one area and you don't take into account the rest of the harbor, you're going to have everything funneling down and more congestion created right in the worst possible place. Thank you.

MR. THOMPSON: Thank you. Come on up.

MR. BAUGHMAN: Hi, my name is Kevin Baughman and I support this new ferry pier as well, especially with the addition of the floating pier. Since Carthaginian is going to be removed, that would probably be a better accommodation for a double canoe and stuff like that.

Going back to the comfort station a little

bit, one of the things I didn't hear mentioned was showers. Right now you've got a lot of commercial activity. There is a lot of repairs that go on at nighttime and stuff. And people have to dive in the harbor sometimes to do underwear repairs and checks on vessels, things like that. It would be really nice if you could somehow include some showers with even maybe warm water, welcome to the 21st century, so that the people that are regular harbor users have access to those facilities.

I like what you're doing and I think it needs to happen and I also support Greg's ideas about pushing the catwalks out to the edge and surfacing those break waters that are out there now. Thank you.

MR. THOMPSON: In Kona storms don't the waves come over the breakwater? If you put them all the way back, wouldn't they be impacted by that surge?

MR. HOLLIS : We're impacted by the surge anyway.

MR. THOMPSON: Please, we would like to hear from each of you if you have something to say. That's why we're here tonight, so that we can learn from you. Let's let this man go first.

MR. FOLEY: I'm Mike Foley, the Maui County planning director.

The first question I have is the location of the restrooms. Is it proposed -- are the restrooms proposed to be where the existing restrooms are?

MR. THOMPSON: Yes, they are, but it's bigger and it would extend -- it's my understanding it will extent a little bit in the direction of the Pioneer Inn. And we understand that that does enter into some county property and we've had some preliminary discussions with the county on that.

MR. FOLEY: Well, my first reaction is that you're talking about two additional piers with a lot of additional boats and the restrooms couldn't be further away. If you're going to build restrooms, you need to build them where the people are. The restrooms now are a long ways from the existing pier and they would be even further from the two new piers.

Our primary concern is going to be related to the impact on the historical resources and how much additional, you know, pedestrian traffic and vehicular traffic will be generated. There is certain no parking for the ferry passengers and you're talking about no restrooms for them either -- unless you build the building. And I think -- I'm just guessing, but I think there will be a lot of people very concerned about building a building out over the water in an

area that's very scenic. I'm not commenting on the architectural design of the building itself; I'm just wondering whether that's a good place for a building.

But my initial reaction is that the restrooms need to be by the additional facilities, not way down at the other end of the harbor.

MR. THOMPSON: We too have contemplated that and we have some cultural and historical concerns here. I mean, this would be the logical place. I think due to that, that's why the first design or the first conceptual drawing had them here actually on the ferry pier. This pier is proposed at this time -- and of course it's subject to change -- but to be built in the manner of the current pier. But again, our plan is not to be increasing activity. Our plan is to just make safer and more orderly the existing amount of activity.

Someone else with a comment? Yes, sir.

MR. FREELAND: My name is Keoki Freeland, I'm the executive director of the Lahaina Restoration Foundation.

First of all, I would like to say that the Lahaina Restoration Foundation is for the proper expansion and increased capacity to the Lahaina Harbor, but we do have some concerns in this plan here. I would like to share some of that with you.

First of all, this project does fall within the Maui County Historic District Number 1; therefore, this project should be put forth through the cultural resource commission for review and approval. And I think you folks have already said that. But also, this project falls within the boundaries of the Lahaina National Historic Landmark. And since federal funds will be used, the National Trust for Historic Preservation should also be included in the permit process. Under the National Restoration Act of 1966, this body reviews all projects where federal funds are used that may have an impact on a national historic landmark. So this needs to go in front of them for review as well.

Now, we are concerned because, you know, we've had the Carthaginian in there for a long time, about building two new piers and I'm going to term it like in harm's way without much protection from high surf. Depending on which way the waves are coming -- Carthaginian is here right now -- the harbor sometimes has no protection at all to the Carthaginian. For instance, if the waves are coming in this direction, okay, that ship breaks lines like crazy and we're trying to keep it in place. Now you're talking about

moving it even farther away from the harbor, this pier here as well as a cultural type vessel out there that's going to be even more in harm's way.

Now, also you said you're not too sure how the dredging is going to work. However, because we've had so much trouble with the Carthaginian over here, I've stood out here on this pier and watched what's happening every time we have some high surf. You have a reef out here that goes all the way to Mala Wharf. And when the waves are pouring in, virtually everything inside the reef, the tide is higher outside the ocean. The tide wants to go back out, but it cannot because the waves are coming in. So it finds a low spot. And where is that? It's the entrance to the harbor. The water comes rushing down in this direction, bumps against the hull of the Carthaginian, and roars out that way.

Now, if you're going to dredge over here, you're going to -- this is what you need to do to try and work out. If you don't have any protection out here, how are you going to keep this thing from filling up with sand again real quick? Or is it going to continue to erode away and affect the historical sites? That's what we would like for you to take a look at.

Now, as far as the design of the comfort station, it looks pretty good to me. But location, like Mr. Foley says, is a problem. But I don't see where else you can put it.

Now, I understood that there was going to be kind of like a staging area for the people coming off of the boats. Is that what's going to be on the pier or is it another facility altogether?

MR. THOMPSON: The only staging area that I'm aware of in this stage and this idea is right here on the pier itself.

MR. FREELAND: Thank you, that answers my questions.

MR. THOMPSON: Thank you. Who's next? Please, we would like to hear from all of you.

MS. LINDSEY: My name is Mary Helen Lindsey, I'm also with the Lahaina Restoration Foundation. And as you just heard, restoration foundation, we're here to preserve what we have. Now, how many feet away are we from the birthing stone?

MR. THOMPSON: Eric, you know that.

MS. LINDSEY: So the question is how many feet. I can see it on paper. But I can't tell you -- can you tell me?

MR. YUASA: About 60, 75 feet. Maybe eighty

feet.

MS. LINDSEY: Where is the floating pier? And here's the birthing stone? No, I'm talking about the ones you folks are projecting. I don't care about the main pier; what I care is what the projection you folks are bringing to us.

MR. THOMPSON: Here's the concern, the distance from here to the birthing stone.

MR. YUASA: Right now it's 60 feet, so I guess it would be another 60 feet. But keep in mind that this distance from the pier to the shore is about 35 feet. So we're not touching the land side. We're not making a land side ramp. We're connecting off of the new ferry pier. We're making a walkway to the floating pier.

MS. LINDSEY: All right, now, because that's very important in our history and we would not like to see -- any dredging should go on, it may do something to it. And if the walls are -- if we do have high surf and stuff, if the walls, because we have those objects in the water it's going to make it turn, just like when you have sand and whatever you dredge out is going to come. Whether it's going to build or take away -- I think it will do both, it depends on how bad our surf has been.

Then I heard you say that you're going to have a place for the surfers. You know, we heard that a long time ago and it was never done. And if you can just keep in mind -- I'm going to go with what I have. Why is the bathroom connected to us having that? If we don't have what you have projected here, does that mean the bathroom is going to sit aside?

MR. THOMPSON: Not necessarily.

MS. LINDSEY: We went through all of this about our bathroom and we thought the funding was going to be allocated. Evidently it has not been, correct?

MR. THOMPSON: Actually the need for the bathroom has been so well documented, we are right now approaching obtaining the funding to do the bathroom on two separate completely different tracks. One is in the state legislature right now with an appropriation and another would be with the federal ferry monies. It's kind of like it would be a very good thing if they both came through. It would be clearly in our best interests to use the federal money because of the match. But if that didn't -- that fell out or we couldn't get all the permits in the amount of time that are required for the federal job and the state appropriation is approved, we'll know that

within another month, we intend to build the comfort station.

Now, how big it is, exactly where it is, that's why we're here tonight. But clearly there is a need for a new bathroom.

MS. LINDSEY: And that's true. So what I have just heard from you is that it was -- it's through the state legislature right now and is going for funding; is that correct?

MR. THOMPSON: Yes. And it's also under consideration separately as a part of this ferry project. And I believe that if for some reason the pier fell through, we could still be able to do the bathroom as a part of the ferry project because it would still service the ferry passengers.

MS. LINDSEY: Okay. I would like a definition of what is a ferry and what is a tender, and is that going to be used also for a tender.

MR. THOMPSON: Okay. A tender is the boat that's shuttling passengers to and from the cruise ships. The ferry is a vessel that is used to take people from island to island or within different harbors within the island, so it's not going to another ship offshore.

The ferry money is tied to a ferry to the exclusion of a cruise ship. But the pier -- and correct me if I am wrong, Eric -- once it's constructed, is not for the exclusive use of a ferry, but it can't be -- it can't be only for a cruise ship. I can tell you -- I know the man in the back has a strong concern. We're not trying to sneak in another cruise ship tender here. We're trying to accommodate an already overcrowded situation, making use of an opportunity of some grant money to do it. That's what's really going on here.

MS. LINDSEY: All right. I've heard what you just said. Now, you have to get an environmental impact statement; is that correct?

MR. THOMPSON: Yes.

MS. LINDSEY: I heard that.

MR. THOMPSON: There was a whole litany of permits that were required.

MS. LINDSEY: So do you have Army Corp of Engineers doing this?

MR. THOMPSON: They would be included in the permitting process.

MS. LINDSEY: And you foresee the time limit as a fast track or is this going to be a slow moving thing?

MR. THOMPSON: The Army Corps would not be the

primary agency. And it's my understanding we have to reach a certain point in that process in order to qualify for the funding, but with the understanding that all of those permits may not have been captured or approved or issued by then.

MS. LINDSEY: I realize that the Lanai and the Molokai is having a whole lot of problems because of its tender uses and because of the sharing of the boats that come in for whale watch and for those fishing boats and for a fueling and all of that. And I feel very, very supportive of the Molokai and Lanai, but I don't know how to do it. I do not. I am truly not in favor of what's going to happen because I'm afraid of our birthing stone, the hanau stone, and open space, which we will not -- the whole harbor will no long better -- there will be no open space. And also the surf will change. You dredge. Dredging will change the whole place. And before -- I can understand you wanting to put in that design because that used to be -- you went back to where the Queen's Palace -- I mean where it was, is that right, Keoki? Kamehameha. So I see you're putting that design there. But again, open space. We need open space. We don't need to have more clutter. And that's my concern. You're going to get an environmental impact statement, that's great, because you will hear both sides and I think the other -- the negative side will come out stronger. Thank you.

MR. THOMPSON: Thank you. If you picture this ferry pier without this building on it, that may be a way to mitigate your concern about open space. Okay. Who can we hear from now? Mr. John.

MR. JOHN: My name is Dave John, I represent the Molokai Ferry. And this is the first time I've seen any of this. We've already heard some pretty strong objections and I think they're well founded. The harbor obviously is over used. The ferries have been pushed in on the existing users of the harbor. And they have tolerated the ferries, just barely. But our facilities are dramatically overburdened.

In looking at this, I would just make a couple suggestions. They're just suggestions. We only have one creator in this world, but we all have -- we have millions and millions of critics. So let me just make a suggestion. I'm not a creator. I would strongly suggest not tying in anything to our rock wall there. I would make this a very simple finger pier that can be used on both sides. I would move this whole mess in as tight as you can, giving as much space to our birthing stone as possible.

I would keep your piers as simple as possible, only driving a couple piles, whether it's a fixed pier on a pile or a floating pier. If you just had a couple piles, you would minimize concerns of erosion, changes to our current patterns, changes to our surfing patterns. I think we've all seen the Carthaginian sitting here -- absolutely we have times of high surf, the water roars out the harbor. You will even see the buoy s being drug underwater as the surge is racing out the channel, which makes the little turning area here very hazardous because you have a lot of current sometimes three or four knots.

But in a nutshell, I would keep a pier out from here. I wouldn't tie into the existing park area. And I would just have a couple -- one very simple finger pier. I don't think you want a great big wide pier there. I think you want a very simple pier.

As far as the comfort station, I'm really concerned about that because we can't even maintain the existing tiny little facility we have which is in the absolute wrong place. I think we should leave that facility there, but I would -- if I can see that one more time, I would really recommend that we remove the harbor agent office as it is, we build a two-story structure much like Maalaea has where the harbor agents would be upstairs and have better view of what's going on, and just put the restrooms underneath and put it right here. Now, the harbor agents already have restrooms. It would be a wonderful thing if we could expand those restrooms and let the general public use it. Because most of the passenger use is here, especially when you start dealing with older people and people with disabilities, having them try to walk all the way down the harbor and use the other facility is pretty tough. The other facility is adequate for the existing boat owners. But when you start having a lot of tourists there, and tourism is just going to increase, I would strongly recommend having the restroom facilities where the people are. I think it just makes sense.

Although nobody wants to see a two-story anything, I think kind of like a harbor office like the control tower type mentality could fit in.

And then we have the other great big issue. You've got piers, you've got places for all the boats, but where do people park, where do people offload, where do the buses park. That's really doesn't have anything to do with the water end, but it's all part of the whole thing.

But in a nutshell, keep your improvements to the water to a minimum, minimum impact, you'll have much better community support. And granted, these areas can be tough to use when we have periods of high surf, but we always don't have high surf. So if you get 90 percent utilization, it's better than nothing. So those are my comments. And I have to go drive a boat here in about 10 minutes, so I'll let the next person carry on.

MR. THOMPSON: Thank you. Anybody else?

MS. NISHIYAMA: Aloha. My name is Patricia Nishiyama [inaudible]. I'm with Na Kapuna O Maui. And here I am to tell you this area is kapu. I'm sorry. The pohaku is very, very sacred to us. So kapuna will take a stand. The pohaku is the piko of our [inaudible] and they do not want it to be disturbed at all. So I am here to say that this area is kapu. Mahalo.

MR. THOMPSON: Thank you.

MR. KHAN: Aloha, everybody, my name is Stuart Khan, I'm the president of the Mala Wharf Fishing & Recreation Association. I've also been a member of the Harbor Advisories Committees for the last 20 years and we've certainly going over a lot of this information.

I would say that the comfort station improvements are needed and you must direct your action at that. As far as the other part which you presented to us tonight, I think with the historic changes that would be impacted on this open space area immediately ought to entice you into looking for another area.

Now, let me read to you from a 1974 State of Hawaii Department of Land and Natural Resources short form. "The destiny of these island as a winter playground for America is something that probably few really appreciate and Maui to have a full part in this future because she has what the tourist wants. But several big things must be accomplished in the meantime. We need a wharf, we need a road, we need parking," et cetera. He concluded by saying, "Big, of course all these things are big, but they're coming." Now, you understand this is in 1974. "We cannot stop destiny, though we may delay it." Then along all of the West Maui coast, there is no deep water port. Landings at various points were built to handle freight and passengers. Some landings were privately financed, others through a combination of government and private capital. Since most of Pioneer Mill's company is shipping was for sugar and freight, concern

for passengers or tourists, the latter of little consequence in early Lahaina was small. But shipping did increase and in the 1920s Baldwin Packers Limited built their new cannery wharf for $250,000. The idea was that both interisland and Trans0- Pacific passenger ships could tie up.

Now, we all know that the Mala Wharf that was created actually got in the way of the current and the boats that were coming there. And as a result, it was condemned almost from the very first three days.

So what I would like to do is present an alternative. And I've not heard an alternative. The alternative that I would like to present -- and I have talked to the Army Corp of Engineers and I'm currently in contact with the Department of Planning engineers to see how this is going to work out. And I think I've figured a way to avoid the graveyards at Mala, to separate the tourist influx from the recreational and commercial boaters at Mala by using the open space above the Kahoma Stream. The Army Corps of Engineers has said that if we span the stream, not put anything in the bottom but span the stream, we can actually put something -- a walkway, a causeway that actually meets a county road. The county road goes to the bathroom at Mala, which has a shower. Behind the bathroom is a county lot which is not been designated anything but could serve as a staging area for the mayor's jitney plan that would go down Front Street, turn around at 505, come back to the Mala area. The area is certainly big enough for the large buses and the taxis.

As you walk out the causeway, it would ramp down to the current height of the Mala Wharf, go out to the end, and because of the current problem, one would have to put like an end on the end so that when the boats tie up, they're in line with the current and not being buffered by the current.

On the other side we have the old Mala Wharf. Well, the old Mala Wharf is old and it needs to be dropped. When it's dropped, concrete culverts can be placed on the dropped portion and the rocks at Mala put on top of that. We would then end up with a south breakwater, a north breakwater, and a partial west breakwater, and an extra ramp for the recreational and commercial boaters at Mala Wharf.

Now, because a county road would be used and the open space of the Kahoma Stream, no impact of the graveyard sites at Mala would be affected at all because we would go right down the side, over the apron, ramp down, go out as far as we need to go, put

in 150 foot what you're talking about on the end at the right angle so that these ferries and cruise ship riders can tie up there. As a result, they would be taken to county parking lot which will take them into town.

Right now, with all the congestion at Lahaina Harbor, a lot of the people don't even stay in Lahaina Town. They get on buses and they go. They're not there. They come back, they get back on the boat, and they're gone.

So I have a kind of sketch drawing that I kind of made out -- I'll pass this along to you. But it basically looks like an arrow where the main section of the arrow is -- I believe it's 120 degrees azimuth, and that's this portion over here, and runs in the Kahoma Stream. Then it goes outside with the extension. On the land side we have the Mala Wharf which now becomes a breakwater and then we end up with three ramp access points at Mala Wharf.

Not sure what else to say other than to say that this is an alternative. It would totally obviate the use of anything in front of the historic open space. Nobody has mentioned the lighthouse, which is also historic. So from actually this point right here to the hanau stone is historic. And the historic register as a historic site points to this area out one mile. So the people who originally discussed the historic consequences of what can be done in Lahaina were very concerned about impacting this open space. And I think to present a plan to our community without looking at other alternatives is kind of lacking on you guys' part. Because we're both -- we're all part of this same thing as far as what the ocean does and how we interact with the ocean. If we don't -- if we don't interact with the ocean in a pono way, the ocean is going to kick us back. And there is no sense in doing this kind of thing in Lahaina when you have the option of doing it down at Mala. Thank you.

MR. THOMPSON: Thank you.

MR. BALL: Good evening. I'm Lindsey Ball. I'm the principal of King Kamehameha III Elementary School. I don't know anything about the piers or the boats or anything. But when you talk about the comfort station, the current one is right at the corner of Canal Street, which is right near one of our entrances. I would like to see it moved towards near where the people need it most. Unfortunately, a lot of tourists get misdirected to our campus, so it's kind of a safety issue and now we've had to take extra precautions keeping people off campus, locking the

gates and so forth. I would like to see it moved down closer to the piers.

I just have a question, though. I am a surfer as well. By dredging, what would that do to the harbor break?

MR. THOMPSON: Well, the study on that is still underway. But we believe that the dredging would be only in this immediate area, not on the reef where the waves are forming. So I think it's too early to really answer that scientifically, but the sense is it would not. But what I'm hearing for the first time tonight is a concern about what I would call the longshore transport of the water or the storm surge and its exit out there. But I mean that's a part of what these types of guys have to do and part of the permitting process, those questions and issues get identified and answered. Someone else, please? Anybody.

MR. KALUA: Good evening. Zeke Kalua, Executive Director, West Maui Tax Payers Association. Just for clarification, the design is 00 pretty much everything that you've presented looks pretty elaborate. Is that based on the standards to qualify for the federal funding to build these? Because I totally understand where the gentleman from Molokai is coming from. I was a resident of Molokai for six years and we've got really basic harbors over there, really basic.

MR. THOMPSON: Actually we have a proposal for Kaunakakai as well. I think the question, Eric, is is this based on an engineering need -- a perception of the need for the ferries or is this based on a criteria to qualify for the funding or a little bit of both.

MR. YUASA: Right now, like we said, these plans are really conceptual plans and it wasn't really designed this way to meet any kind of Federal Transit Administration kind of requirement. They pretty much gave us pretty wide I guess discretion as to what type of facilities can be best used to enhance the ferry operations. And I think what our consultants did was they looked at the existing operations and they looked at ways to make it better and make it safer.

MR. KALUA: The only reason I wanted to clarify that is because if the consensus of this room was to totally agree with what the gentleman from Molokai said as far as narrowing the harbors, I just wanted to get a more clear view of what we can actually suggest to you. As far as the width itself, you know, does it have to be 140 feet long, does it

have to be 48 feet wide, does it have to connect right there to the wall, do we have to have the floating dock as opposed to another portion of maybe a breakwater or even or more permanent pier on the other end.

I haven't lived in Lahaina all my life, but I've witnessed a lot that's happened with the Carthaginian. And when I look at the outside floating dock, if it was a matter of people just using it to access surf, that's one point, but the deliberation between putting a replica of the Carthaginian versus a double hulled canoe is still in the air, it's not been decided. So just that that may be another point for you to seriously consider. If the Carthaginian was to receive a replica that looked somewhat similar to it, in your personal opinion would that floating dock be enough to sustain that kind of a vessel anyway. And when we consider the type of people that visited the Carthaginian prior to its demise, you know, we've got people that access that that can barely walk, we've got people in wheelchairs, we've got kids that are running up and down. I would hate to see that floating dock all of a sudden have a huge staircase going straight up to the boat because it's nine feet above the level of the floating dock.

MR. THOMPSON: Thank you. Your comments are exactly why we're here tonight because we thought it was important to be able to accommodate the organization that now has the Carthaginian. But clearly if you put a Carthaginian there versus a low free board no windage kind of a double hulled canoe, it significantly alters what the structural engineer has to do.

When I listen to Mr. Young, I too thought that was an innovative idea. We've had lots of internal talks and that hadn't come up. So the airplane ticket was already paid for. But at the same time, I'm trying to -- while he was speaking, I'm thinking of the number of people take come on -- I've ridden -- rode the ferry to Lanai and I've seen the lines and I think part of it, I'm sure, is just to accommodate safety, you have enough walkway on either side of the gangway, you have enough walkway to go each side. I'm just trying to get inside their heads. Part of it may be how strong it has to be built because the breakwater doesn't cover. There is probably lots of considerations. But we're listening and we go back and try to digest all that we hear.

Anybody else?

MR. KHAN: Once again, I'm Stuart Khan,

president of Mala Wharf Fishing & Recreation Association. I just wanted to bring up to date the people who are here who have not attended Harbor Advisory Committee meetings. During Chuck Penken's tenure, the only thing that we could do in the Lahaina Harbor was to dredge to the catwalk on the mauka side and the makai side which would add about 100 feet in the harbor. Those documents should be in your files somewhere.

The other thing that I wanted to bring up, and it's only been mentioned casually, is that for the last 10 years or so we've been trying to put in a surfer swim step pretty much right here, somewhere in here, where the surfers could go into the water, go out to the reef, and come back and have a shower stall. That surfer swim steps was at the top of every agenda meeting for every Harbor Advisory Committee meeting for the last five years. And it's -- there is still no surfer swim steps.

MR. THOMPSON: I can tell you that was one of the first things the harbor master's brought to our attention. And we had conceptually thought to include that here as a way to try to keep the surfers a further distance from the motorized ferries, just for safety purposes. We do recognize the need to try to help? Yeah. I mean, I too am a surfer. I mean, as a young kid I'd probably jump off the end. But they would clearly be better here. I think it might even be better there. Where it's better, I don't know, but that's why we're here tonight.

MR. KHAN: Okay. I just don't want you to use this plan as a way to get the surfer swim steps in down by the hanau stone. That would be nuts. Interfering with this historic view, whether it's from the land or the ocean, is going against historic principles that we live in here in Lahaina. We don't want to change our history. We want the people who come to see our history. If we start building things like that, we have already destroyed our history and that's not good progress.

MR. THOMPSON: Thank you. Let me just address a couple of his comments about dredging, and it's been a topic for others as well.

Again, the surveys are being taken to determine what -- to what extent, if any, dredging would have to take place. But when we use the term dredging here in tonight's presentation, we're talking about new dredging in areas that have not been dredged or are not part of the current channel. Clearly what we call maintenance dredging has to occur periodically

because harbors silt up and the control depth gets shallower. And I think the permit that the gentleman just talked about are the limitations. We have standing permits at different harbors -- and I don't know the status of the one for Lahaina -- that allow a certain amount to be taken out periodically and it's usually a very small amount. It happens routinely at ramps. It's my understanding here on Maui Kihei ramp is in need of it right now. So my sense is when you are talking about you can only go in certain areas, it was related to that standing permit. If you get to a point where you needed to do a lot of dredging like maybe the entire harbor basin, that would be a separate permitting process through the Corps.

But for tonight's topic, so we're all on the same page, is say to build this or put the pilings in or say if the Carthaginian replacement was on this side rather than this side, this area may not have ever been dredged. And then it would be new dredging. We're not talking about maintenance dredging.

I understand your concern. I'm just trying to make sure we're all clear and we don't know to what extent, if any, it would need to be done. And clearly that has to be disclosed. I understand people are very vehemently opposed to that, some of you, and others would probably find it acceptable. But I just want to clarify where we're at on that.

MR. FOLEY: I want to take to ask a couple more questions and also make a couple more statements. I'm sorry, Mike Foley, county planning director.

One facility that I've heard a lot of demand for in this harbor and other harbors that I haven't heard about tonight is pump out stations. The boats, as you know, have no pump out facilities. There has been one historically somewhere at Lahaina Harbor, but my understanding is that it seldom works and is sometimes locked. But basically it isn't available. A pump out station is a very necessary feature for Lahaina Harbor.

The other thing I wanted to do is second Keoki's statement about putting the Carthaginian's replacement out there at the north end of the finger -- of that new multipurpose pier would place that vessel, whatever it is, in a tremendous amount of exposure. And if it's a vessel like the Carthaginian, it's not going to live as long as the Carthaginian did.

The other thing I wanted to ask about is the EIS. A couple of the issues that the EIS have to address are the impacts of dredging on the harbor, the

impacts of dredging on surfing. I have a question as to what agency will be the accepting agency. Do you know that yet?

MR. YUASA: The governor will be the accepting agency.

MR. FOLEY: Who?

MR. YUASA: The governor. Through I guess the Office of Environmental Quality.

MR. FOLEY: The other thing I wanted to mention is alternatives. The Environmental Impact Statement, as you know, requires examination of alternatives. And several alternatives need to be address. One is no project. One is one pier instead of two piers. And another would be to build the pier somewhere else. And also to build the other facilities in a different location like especially the restrooms.

And I agree with Keoki that it's going to be very hard to find another location for the restrooms, but they're really not appropriate next to the elementary school and they're really necessary down here where all the people get off the boats, not at the other end of the harbor, as I said before.

The other thing is that the EIS needs to examine how much advantage or -- I don't know how exactly to phrase it, but it's very naive to think that this isn't going to generate more cruise ship use because the tenders are going to have a significantly easier time landing at Lahaina Harbor than they do now. So by having two additional locations for tenders from cruise ships, you're obviously making it a lot easier for the cruise ships to use their tenders. And I'm not saying that that's good or bad, but it definitely should be analyzed in the Environmental Impact Statement.

And with respect to your timing, this project needs to go through state, federal, county agencies including, as Keoki said, this is a national landmark and it has to go through the Cultural Resources Commission. It also has to go through the Maui Planning Commission for the SMA application. And I don't know what your schedule is for reviewing the EIS, but the county's schedule is 10 months. So build that into your -- build that into your process. That's assuming you go through the planning commission and the CRC in one meeting and nobody has done that lately.

MR. THOMPSON: Thank you. Anyone else?

MS. COUCH: Leslie Couch for Representative Blundell. Have you taken into consideration the

security issues with the cruise ships if they use that -- the middle pier?

MR. THOMPSON: Yeah. In fact, that's a good question, we should have covered that. At this time the security for cruise ships is required and at this time it is not required for the ferries. So the concern that some expressed about the cruise ship activity, the cruise ship activity would have to remain where the security is. I don't know if the ferry operators have ever received any comments about security requirements in the wind -- I'm not aware of any as -- as involved with the harbors, but I would not be surprised to see that coming in the future. But right now the security issue is only for cruise ships and we wouldn't be putting security at each spot. But I'll tell you, I have considered that it should be considered during the design when you get further along in case security is required for ferries.

MR. BRUN: Hello, my name is Tom Brun, I have Kamehameha Sails down at the harbor. And as one who does operate out of there every day, I would like to reiterate that you will need to dredge to put anything here. It's not a maybe; it will be. And it is very exposed. And a little finger pier, whether there is a

Carthaginian or replica there, will get trashed.

It won't affect the surf. It's way inside of the surf line. But that area gets wild. I have old 8 millimeter footage from the '70s if you would like to see it. It's not protected; it's wild.

My other concern is back to once you get everybody on land, everybody -- there is still no accommodations for all the people in the cars and the parking. Like right now, I old ride my old Schwinn bicycle with a six gallon gas tank to get fuel on that loading dock and I have to go through quite a little process just to get there. So Dave's idea of having a comfort station there when the cruise ships is in won't work because of security.

And like I say, more facilities is going to bring in more. And it's so choked right now, I don't know what you're planning as far as the land part of the deal. Obviously I'm opposed to the whole idea for many different reasons. Not to mention the harbor itself right now. Talk about deplorable conditions. Down where I work in the harbor, the railings are falling in, the electricity is falling in the water. What about -- those to me would be improvements. This to me isn't an improvement. It's in a lot of ways an unwanted addition to the harbor. And I think there is

a lot more thinking to do before you start diving in.

Because like this pier here, I guarantee you it won't last one kona. I don't care how many pilings you put down. And just we are concerned with the harbor that exists is falling into the ground. So who's funding all of this? Why can't some funding go to the existing harbor?

Go back to -- Mala Wharf would be place -- if the cruise ships want to come in, take them to another place. It's changing the face of Lahaina dramatically from one end to the other and I would just like to say once again I'm vehemently opposed. Thank you.

MR. THOMPSON: Thank you.

MR. WHITEHEAD: My name is Tony Whitehead and I would just like to say -- to kind of say what he's saying about this floating pier. I wouldn't even see it lasting a year. Just because it's just going to get pounded. And we know we have a hard time getting the maintenance done on the harbor as it is. And this is something that they are going to be blocking Front Street to pick it up off the beach to put it on a trailer to put it back out there. Bad problem.

And if you ever noticed inside where they do park the ferries, they drive pylons, and that's where they got the docks to walk out on to. If you go look at them, they were put in like -- I'm guessing -- last year. I could be a little wrong. But they're like leaning about that far because you've got 50 or 60 tons of boat pushing up against them and it just can't handle it. So I think the pylon trying to hold anything where the surf is coming in, I mean, I just -- I don't see it lasting -- if it made it a year, I would be surprised.

MR. THOMPSON: Thank you. Greg?

MR. HOLLIS: Again, my name is Greg Hollis from the Ocean Tourism Coalition. I've heard a lot of discussion and it's been enlightening listening to some of the other comments. I think the engineering and the capabilities with the new materials, we should explore how to protect all of our sacred areas along that coastline regardless of whether this finger pier is built or not because the current situation with the water flushing back through is going to eventually erode away or build up. It comes and goes with the change in the season. But it's something that does need to be addressed.

I think that the idea of floating piers, though, should be given some more research and some more merit. It's used in a lot of harbors throughout the world with a great deal of success. And the one

thing that we were not unique in is having surge current, strong storms, things like that hitting us. And the floating pier situation in other areas have been met with great success. But it needs to be engineered properly. So tying the two -- again what we've commented, taking some consideration to what's happening inside the harbor, this has to be a total plan. You can't just address the bottleneck at the end because you're going to create more problems than we solve. But addressing the rest of the harbor using the same floating piers or something along that line, you can gain a lot of space internally in the turning basin. It's been common, it's been sent to the Department of Land and Natural Resources numerous times, to move the footprint inside the harbor gives a lot more space and ability for boats to maneuver without changing the outside. You don't have to do -- affect the surf zone and those kinds of things. And you're going to have to do something. Because under the current situation on the existing loading dock, you can have three vessels basically around the dock as a general rule. And with certain catamarans on the face, other vessels are eliminated from being able to even enter the harbor because of the spacing. You add another pier and you don't address that concern, you now have increased it from three potential vessels around the bottleneck to doubling it to six. And you still haven't addressed -- what I'm seeing here is again just addressing the pier and the loading dock, not taking into account the rest of the harbor. And you have to look at it as a total picture or you will create more problems than you'll solve.

One thing that I've heard about the comfort stations and different things, we want to be careful about where we congregate people. The comfort station is going to be a positive thing and it's readily accessible. It could also be a negative thing in that that's where everybody is going to go. So you want to take that into account in your placement. And I wouldn't necessarily rule out having multiple comfort stations because if we make better utilization of the rest of the harbor inside, you can move a lot of your pedestrian traffic and other harbor users further -- and having more accessibility in the harbor which puts the comfort station that's in place right now under more utilization. So there is conceivable the need to have that comfort station upgraded and an alternate site somewhere closer to where the ferries land. Thank you.

MR. THOMPSON: Thank you. With your concern

about floating docks, you should know that these gentlemen's firm, Mitsunaga & Associates, have designed two floating docks for the Ala Wai Harbor. So they have a lot of experience I think in evaluating different design concepts of floating docks.

Anybody else?

MR. BAUGHMAN: Thank you. Once again, I am Kevin Baughman. I do have a boat out there on a mooring. And my wife and I have tried to come in before and be able to use the facilities for refueling and stuff like that and the major thing that we're trying to address here are the ferry boats coming in and out, which also does seem to alleviate some of the traffic or spread out some of the traffic from when the cruise ships do come in.

The fact is, these harbors were built as small boat harbors approximately 40 years ago and during this time we've seen a lot of commercial activity grow and we're not addressing that. I would like to say that -- I like Stuart's ideas about the cruise ships and dealing with those. I think we need to have some more public forums on that. Until we do, what we need to do is address some of the security issues. You were talking about parking for the restrooms and stuff. When they do have cruise ships come in that are already on the schedule, they shut off the parking in Canal Street so that parking area you have out there wouldn't be allowed to be used by anybody unless you make changes to the security that's going on.

The other thing is you're tying in this new large pier to the seawall there and that becomes a security zone. What I think might be more appropriate is to put the walkway from the existing pier going over and then you could have security area there without affecting the open space, the historical space that everybody is dealing with.

And going back to the openness, that really does need to be addressed as far as the waves coming in and stuff like that because what everybody has testified to is that the buoys get washed out of the channel and stuff like that, it does happen. There is definitely a force to be dealt with there and that needs to be considered in the plans. That's pretty much what I have for right now. Thank you.

MR. THOMPSON: Thank you.

MR. KHAN: Stuart Khan again. As I've listened tonight, I've not heard anybody say what the numbers of cruise ships are. And just for your information and our information, when we first started looking at the cruise ships back in the '80s, there

were only two or three. Right now there are more than 70 out of 230-plus cruise ship vessels that are eligible to visit Lahaina. And it's increasing. Every year another cruise ship comes in, bringing more people. In March we had 15,000 people come off the cruise ships into Lahaina Harbor. Thank you.

MS. BAUGHMAN: Good evening. My name is Pam Baughman. I'm Kevin's wife. As he said, we do have a 46-foot sailboat and about two years ago we ended up having to moor alongside the Carthaginian during one of the storms. We got the heck beaten out of us. I mean we broke lines, we did a lot of damage to our boat because of the surge.

I have a big concern about the parking. Also, it's like where do you put the cars? We do have a permit that we sometimes do get into that little parking lot that's over on the far end of the harbor and you have to get there early in the morning around 7:00 or you don't get a space. There are illegal cars that are parked there that do not have stickers. Now, around the tree, same thing, you know, it's like where do you put all these cars? That's all I have to say. That is a good idea, but we do have, you know, a lot of problems.

MR. THOMPSON: Thank you. Okay. One more

time, sure.

MR. FREELAND: Keoki Freeland again. I just want to talk a little bit more about the dredging. If this is the Carthaginian right here, can anybody remember when the channel was dredged last? It's been years. And the channel is still deep enough. Why? It's my opinion is because every time the surf comes up, it sluices out the channel and it's cleaning it out. That surge is to strong, it's sluicing it out.

Now, if you go out there tomorrow at low tide, take a look at this area. You can walk and lucky if the water is going to hit your hips, it's that shallow. Even a canoe cannot go over here without dredging. If you dredge, you're going to have to dredge all the way out this way. And what we're concerned is it's either going to fill up with sand right away after the first big surf, or it's going to undermine everything, which is a real problem if that happens because all this historical stuff would be in great danger. That's what we're very much concerned with.

MR. THOMPSON: Thank you. As we're winding down tonight, I don't want you to think this is your last opportunity to comment. You should feel free to send us at the Department of Land and Natural

Resources Boating Division any comments. You can send them by fax, mail, you could drop them off. We have forms here. Okay. Can we show where those are again right here? And if you don't get a form or you think of something after you turn the form in, you can turn it in at the harbor master's office, ask them to get it to us in Honolulu.

I think before we close, I would like to thank everybody for coming, taking time from your busy schedule and for sharing freely with us. I know I heard several things tonight that I had not considered or heard in numerous pre kind of planning meetings on this project. It's been very valuable.

Unless someone else has another comment, anybody? Okay. We have one more. Good.

MS. MOORE: Diane Moore, Friends of Mokula Maui Nei. The whole business about the harbor, the number one concern is the restroom facilities and that has been all of our concern that live and work in Lahaina. I think we're being distracted by what you're trying to do with the facilities for the tenders. The ferries is a different issue, with Molokai and Lanai.

Affecting our historical site is a very, very important concern for a lot of us. The use of another location I think is a great idea, Mala ramp. I don't know what is involved in that, but why can't we use that area. It used to be there for some reason. Why it was destroyed and -- I believe through Iniki it was. Then can we rebuild that? Can we use that area for some of the tendering that we're talking about?

Existing problems right now I believe is the timing of the arrivals of the tenders. If we took a look or maybe speak with the harbor master, which I'm surprised not any of them are here, I don't see anybody anyways.

MR. THOMPSON: They're actually working with a cruise ship.

MS. MOORE: Exactly. That's what I thought. Maybe we could suggest timing. In other words, there is early morning where all the fishing boats go out. There is different times in the day that we could use for the tenders versus the ferries.

The business I'm in, I work with the cruise ships so this would affect me. But my biggest concern is what's happening at Lahaina Harbor. If you try to go back to where you had all the ferries coming in and the tenders coming in at the same time, there is no way you're going to be able to handle all the people. We have a tough enough time right now. Not only just

parking, but the buses -- because all the tenders from the cruise ships, they all want to go on the tours and you've got several buses. So if you add more spaces for the tenders to come in, they are going to want more buses and where are we going to put everyone? So if we maybe use another location for some of these tours or buses and all that, like Mala ramp, then you would alleviate that problem.

MR. THOMPSON: I can share with you, I went -- not this most recent meeting, but a month ago I went to a Mala Harbor Advisory meeting and the issue -- the primary issue there was a few of the boats from Kaanapali coming in there. And it seemed to me -- I only have one meeting's worth of experience, but there seemed to be a lot of concern about the level of commercial activity there. So as I hear the comments of the alternative location, clearly that has to be explored as part of the permitting process and we certainly haven't discounted it, but I'm not so sure the Mala folks -- although I know he represents Mala there -- I would be curious to learn if they would seriously consider or accept cruise ships or ferries coming to Mala. I mean, that would be a whole other community issue.

MS. MOORE: There is also, as far as the

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floating dock idea, I mean, that's just ridiculous. There is another location in Lahaina Harbor that used to be like a ramp. It's down further. I don't know if that's another thing that you can look at in your planning or have you looked at it, as far as I don't know if tenders can use it but maybe some of the other boats that we have can use that area. I used to have a sailboat at Lahaina and that's why I'm familiar with some of this stuff.

And again, the biggest concern I have is the traffic issue, not only of cars as of people and taking care of our existing people that we have right now instead of creating more problems, you know, by bringing in more people, we need to resolve handling the people we do have come in to Lahaina.

MR. THOMPSON: I can tell you in meetings with the federal folks with respect to the proposed projects we have for Manele at Lanai, we do know that roadway improvements can be included as a part of that funding source. Everything is so limited in Lahaina with -- there seems to be something everywhere. So it's a very big challenge. But I understand your concern. And I do recognize that we have a responsibility to take into consideration clearly what goes on in the land side in addition to the water

side. So thank you.

MR. KHAN: Stuart Khan again. I would just like to respond about the Mala area. It's not the ramp that we're talking about. We're talking about totally separating this commercial activity -- even the access. Even the access, it's a county road access that goes right up to the Kahoma Stream. We're looking at a span across the Kahoma Stream that goes down to the water, goes out quite a ways to where maybe where the old wharf used to go. That was about 900 feet. And then taking a portion of that off to the what would be the north side to allow the commercial activity.

The ramp would get the benefit of an additional ramp place and we do have a cap on the commercial permits from the land side; that's 15. And as a result, people who use Mala ramp would not interact with the tourists or the ferry population at all.

The county road goes right into an area that has been laid dormant and is county owned and could very well be the area where the large buses and the taxicabs and others use for parking, staging.

What we do find at Mala now is that the large buses go down into Mala ramp and they hang out there.

So trying to look at it in a very overall kind of way, it seems to me if we can keep those two separate, the recreational and this highly commercial area, that -- and the main separation is from the graves. The graves go right down to the ocean. They come back up to a crypt. They go across over to Wilson's yard. They cross the Mala Wharf approach road and go on to the berm at the Puupiha Cemetery. So as long as those things are avoided and not disturbed, I don't think there would be much objection from the Mala Wharf community.

MR. THOMPSON: All right. I think we'll conclude the meeting now. I would like to, for the record, those of you that need an address, you can send comments to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation. The address is 333 Queen street, Suite 300, Honolulu, Hawaii, 96813. We also have the form here or you could also send them to the Engineering Division at P.O. Box 373, Honolulu, 96809. That would be the Department of Land and Natural Resources, Engineering Division.

VOICE: Do you have email addresses?

MR. THOMPSON: Yeah, We have e-mail addresses. Those are kind of long. Eric, yours is -- do you have

it on here?

MR. YUASA: You can e-mail me at ERIC.T.YUASA@hawaii.gov.

MR. THOMPSON: And if somebody forgets all that stuff or puts a dot in the wrong place, you can always go to the harbor master's office and they know how to find us. Thanks again for coming out tonight. Drive safely on the way home. Thank you. Aloha.

(WHEREUPON, the public meeting was concluded at 8:50 p.m.)

CERTIFICATE

STATE OF HAWAII)
) SS.
COUNTY OF MAUI)

I, LYNANN NICELY, RPR, Notary Public for the State of Hawaii, certify:

That on the 8th day of April, 2004, the proceedings was taken by me in machine shorthand and were thereafter reduced to print under my supervision by means of computer-assisted transcription; that the foregoing represents, to my best ability, a true and accurate transcript of the proceedings had in the foregoing matter.

I further certify that I am not attorney for any of the parties hereto, nor in any way interested in the outcome of the cause named in the caption. Dated this 14th day of April, 2004

Lynann Nicely

NOTARY PUBLIC, State of Hawaii

My commission expires: 1/24/2006

APPENDIX J.

Lahaina Small Boat Harbor Ferry Pier Improvements, Environmental Impact Statement Public Scoping Meeting, December 8, 2004

ORIGINAL

LAHAINA SMALL BOAT HARBOR
FERRY PIER IMPROVEMENTS
ENVIRONMENTAL IMPACT STATEMENT
PUBLIC SCOPING MEETING
DECEMBER 8, 2004, 6:00 PM
AT LAHAINALUNA INTERMEDIATE
LAHAINA, MAUI, HAWAII

MR. RICE: Good evening. My name is Richard Rice. Hi. Good evening, everybody. My name is Richard Rice. I'm much louder than the microphone, so we'll have to use it a little bit as we go on.

I want to thank you all for coming here. This is an extremely important step that we want to go ahead with the community in looking for your input on this improvement to the harbor. I know a lot of you got here earlier and had a chance to look around at it and some of the details. And we're going to have some experts come up and talk to you on it.

I forgot, I didn't introduce myself. My name is Richard Rice. I'm the administrator for the Small Boat Harbors. And I have my Harbormaster here, Hal, and the power behind the throne, Stacey. So any real questions, they have the answers to.

I want to jump ahead right now and have Mich Hirano, who is our consultant, the gentleman who understands all these wonderful architectural drawings, step up and go through some of these issues. Again, this is focusing on just what can we do for health and safety within Lahaina Harbor. This is not about the whole community, other parts have impact on that one, but it's important to the EIS that we understand those impacts. So there are several levels to this one.

Mich, you want to go ahead and get me out of hot water?

MR. HIRANO: Thank you, Richard.

Good evening, folks. As Richard said, my name is Mich Hirano, and I'm with Munekiyo & Hiraga. Our firm has been hired to prepare the Environmental Impact Statement for the project, as well as to do the project permitting. And tonight I would like to just briefly describe the project and what the scoping meeting is about.

We don't want to get into the issues of the project at this particular time in terms of the -- I guess the details, but we do want to hear from you with regard -- in regards to the -- I guess the importance that will be placed on certain aspects that you feel we should be aware of as we prepare the Environmental Impact Statement.

So I hope you can all see this slide. I'll just move out of the way.

This is a scoping meeting. And the Notice of Intent was issued by the Federal Transit Authority in November, I think it was November 23rd there was a notice of intent that a Federal Environmental Impact Statement will be prepared for the project.

So can we just have the next slide?

The project sponsor is the State of Hawaii, Department of Land and Natural Resources. The property, the

harbor, is owned by the State of Hawaii, Department of Land and Natural Resources, and, of course, is administered by the Boating and Ocean Recreation Division.

The Environmental Impact Consultant Team, I'd just like to show you -- Next slide. The Environmental Impact Statement consultant team, Mitsunaga & Associates is the general contractor or general consultant. Steve Long, vice president of Mitsunaga & Associates, is here tonight, and they're doing the architectural work, conceptional design, and the hydrographic survey for the project.

Our firm, Munekiyo & Hiraga, we're responsible for the preparation of the Environmental Impact Statement. We're doing the project permitting.

Edward K. Noda & Associates are doing the coastal processing, the marine water quality analysis, and the marine biology.

Pacific Legacy, Incorporated will be doing the Archeological Inventory Survey, the Cultural Impact Assessment, and what they call the Section 106 Consultation with the Native Hawaiian organizations in the area.

Okay. Next slide.

With respect to tonight's purpose, the EIS scoping objectives -- And I would just like to go over them very briefly to give you a context in which we want to have your comments received this evening. The EIS scoping objective is to insure that all significant issues related to this proposed action are identified and addressed. That is our responsibility as preparers of the Environmental Impact Statement; however, we rely on a lot of public comment and a lot of public input in order to determine and get a sense of what is important and what we should be looking at and what we should be assessing as we prepare the Environmental Impact Statement.

It would be helpful if the comments should focus on proposing alternatives that have may have less impacts while achieving similar transportation objectives. And I think it's important to remember that this particular project is in response to a need that has been identified in the Lahaina Small Boat Harbor. And so our work is to respond to that need through design solutions as well as through mitigation.

The other aspect of the scoping is to identify specific socio-economic and environmental issues to be evaluated in the EIS. And as I said, we rely on your input to provide that guidance for us as well. We do our own research, but we also rely on public input, and that will be included in the Environmental Impact Statement.

Just some general orientation for you, and I'm sure that you all are very familiar with the area, but this is just the regional location map. As you know,

Lahaina, this is the Lahaina Small Boat Harbor. And the project location is the proposed ferry pier.

This is an air photo of the boat harbor. The existing pier is right here; of course, the breakwater; the slips within the harbor; Kamehameha III School; the courthouse; Pioneer Inn. This is the existing harbor, the existing pier in the harbor. This is the "Carthaginian." This is a tender boat just leaving the harbor; surf breaks in and around the harbor; and Front Street running along here.

In terms of just background, the Lahaina Harbor was originally built and dredged in 1955. It consisted of a single breakwater, a pier, and a restroom facility. In the mid 1980's interisland ferry services began operating between Lahaina Small Boat Harbor and the Manele Small Boat Harbor on Lanai, as well as between the Lahaina Small Boat Harbor and the Kaunakakai Small Boat Harbor on Molokai. In the 1990's operational and safety deficiencies became an issue, were identified by DLNR as a priority in order to develop solutions to operational problems that were encountered through congestion in the Lahaina Small Boat Harbor as well as the deficiencies in the facilities.

In terms of project need, it's very simple: The existing pier is unable to provide a safe and readily available loading and unloading docking facility for the interisland ferry. There are two ferry operations operating out of Lahaina Small Boat Harbor. And the priority for the funds -- These are funds from the Federal Transit Authority, and these funds are used to increase interisland traffic -- interisland transportation, to facilitate and improve interisland transportation, and so the funds are targeted for this particular purpose. And, therefore, the focus on the improvements are to create a safe as well as operating efficient loading and unloading facility for the interisland ferries.

In terms of the project objectives, there are two. One is to improve existing operating conditions of the interisland ferry terminal; and second objective is to provide a safe and more convenient ferry facility. Again, these objectives are driven by the source funding for this particular project. As well through improvements of the existing ferry operations by the proposed solution of a new ferry pier, it would also help alleviate some of the congestion in the harbor, and it will also provide benefits to other boating communities and other boating users or harbor users in the Lahaina Small Boat Harbor. But the primary focus is for the ferry operations. And, again, I stress this to keep in mind that when we're looking at alternatives, we have to see and assess those alternatives in terms of the project need and the project objectives.

So based on that in terms of just background

to it, the Department of Land and Natural Resources had identified funding; had, I guess, been able to secure funding from the Federal Transit Authority for a number of improvements to harbors on Maui or in the State of Hawaii. And the County of Maui was a recipient of harbor improvements that will be proposed for Manele on Lanai, Kaunakakai on Molokai, Lahaina Small Boat Harbor, and Ma'alaea Small Boat Harbor.

This particular project is to look at improvements to the Lahaina Small Boat Harbor and the new ferry pier. And there was an earlier scoping meeting or earlier public information meeting, and in that -- in April of this year, and a much larger proposal was put forward to the community. And there was a lot of concern about that proposal. There were a number of issues about that, which we could get into later and I'll identify and just describe, but the result of that meeting was to really scale down the proposal quite a bit in order to try and work with the community and to try and, I guess, mitigate some of the concerns that were raised with the earlier proposals.

So tonight we're sort of publicly bringing forward revisions to the proposal that were originally put forward in April of 2004 with the new ferry proposal. And the new ferry proposal basically entails development of a new ferry pier which will be approximately 35-feet wide and

60-feet long. It will be connected to the existing pier by a 12-foot-wide walkway 60-feet long. And this is the scope of the project to -- in terms of the ferry pier: Would be able to dock two boats or ferries -- primarily ferries at this time on the south side and the north side. And by doing that, it would also free up some of the use on the existing pier.

In terms of this particular project, it is 135 feet south of the Hauola Stone. It's about 35 feet east of it. It's away from the tower and away from the sea wall. And so access to this -- access to the new pier will be provided by the existing pier and this walkway.

There's also consideration to look at a shade structure, a possible one-story open structure on the new ferry pier. And the Department of Land and Natural Resources is also looking at a possible one-story open structure on the existing pier for shade.

To give you a different perspective and view of the project, this is a plan view looking down on top of the -- on the top of the screen looking down on top of the structure. And this is the walkway and this is the roof structure and the perimeter of the new pier. This is the existing wall, sea wall, along here, so it's detached from the sea wall. This is water all around.

And if you look at the section of the ferry

pier, that is if you cut this -- cut across here, if you had a knife and just were able to cut across and slice down that view, you would see this particular section of the ferry pier. So this is the existing sea wall and water here. As I said, it's detached from the sea wall. This structure will be -- This is the new pier. This is the 60-foot length of the pier. There will be a sheet pile on all sides and then fill in the middle. Same construction as the existing pier.

This is the shade structure that is also being considered as an improvement with the project.

I'd like to just review some of the earlier proposals that were put forward. This one is the initial ferry pier concept. And the initial ferry pier concept, if you look at the overall site plan, was to connect the ferry pier to the existing sea wall and have a ramp from the sea wall on to the ferry pier. The ferry pier was much larger. It was 48-feet wide and 145-feet long. It had as a possible improvement a multipurpose pier which would extend from and be accessed by -- from the new ferry pier. And this would be a floating dock.

And as you can see, this would be the -- this is the existing ferry pier. And it will be 60 feet to the north of the existing ferry pier.

The section of this particular alternative is shown in section A. And, again, it's the same type of construction. It's sheet pile with fill, concrete surface, and a ramp with guardrails on both sides.

And as this one was put forward, concern was raised with respect to the Hauola Stone. There's some significant cultural resources along this area as well, in proximity to the lighthouse, access over this area, and it was just, again, felt that this particular proposal would have fairly adverse impacts to these cultural resources.

This is just a little more detail of the multipurpose pier concept. And the reason for that is there are a lot of surfers who use this pier to get out to the surfing sites in front of the Lahaina Small Boat Harbor. So this multipurpose pier was developed to respond to their needs and to provide a facility for safe entry and exit to the water for the surfers. The pier -- the multipurpose pier from the new ferry pier would be built up on these piles and there would be a concrete walkway. And, again, this would be secured by piles in the harbor and a floating platform, floating deck for the multipurpose pier.

And this is another view of the multipurpose pier.

This third alternative, which received, again, a lot of comment, was -- it was a similar basic foundation in terms of the ferry pier as the second alternative that I showed you, just the previous alternative.

It had the multipurpose pier as well as the same dimensions; 45-feet wide, 140-feet long. This one is 140-feet long, I believe. And it had a two-story structure on top of it. It would be accessed again by the -- along the breakwater -- I'm sorry, the sea wall; access on to the ferry pier.

There would be a two-story structure. The lower floor would be an assembly area for the ferry terminal; passenger loading, unloading area, shelter. And the second floor would house a public comfort station. It would have a concessionary area and the administrative offices.

So those were the earlier proposals that were presented to the public in the April meetings.

I'd just like to outline the EIS process for you to give you a contextual sort of relationship as to where we are today and where we will be going in terms of the preparation of the Environmental Impact Statement and the steps that will be involved in finalizing the Environmental Impact Statement; and to assure you that during this process there will be a number of opportunities for more public comment, for more public meetings as we finalize the Environmental Impact Statement.

So there are approximately nine steps involved, and I would just briefly outline each one.

The Notice of Intent; as I mentioned, this -- there are State environmental laws and there are Federal environmental laws. And because Federal funds are used for this particular project, funds from the Federal Transit Administration, we have to go through both the State laws, which are the environmental laws through Chapter 343 of the Hawaii Revised Statutes, and the Federal environmental impact laws developed -- or pursuant to the National Environmental Policy Act of 1969.

The Federal side of the environmental process is -- starts with early scoping. And I think the April meeting was considered an early scoping meeting. This is sort of the official kickoff and this is the Notice of Intent. This Notice of Intent was published in the "Federal Register" and it basically alerts the community and the agencies that a Federal Environmental Impact Statement will be prepared, and it's to give notice that this process is now underway. This was published in the "Federal Register" out of Washington, DC in November -- on November 23rd.

And the Notice of Intent was to notify the public that a Federal Environmental Impact Statement will be prepared and that a scoping meeting to review the project alternatives and to get community or public input and comments into the EIS process will be held today, December 8th. And so here we are, you know, through the Federal notice.

The Environmental Impact Statement

Preparation Notice, which is an EIS PN, you know, what is called the EIS PN for short, is through the State process. This is through Chapter 343 of the Hawaii Revised Statutes. And, again, this is at the State level notifying agencies and the public that an Environmental Impact Statement will be prepared for this particular project. This Environmental Impact Statement Preparation Notice was published in the State "Environmental Bulletin" today as well, December 8.

And there's a 30-day comment period for both the scoping comments as well as the EIS prep comments. And we run these -- I mean, this is intentional, this is our effort to kind of bring efficiency to this process by running these reviews concurrently, which means at the same time, rather than completing one process and going through the same process. We're running these on a dual track as we prepare the EIS. So we'll be preparing a State EIS which will meet Federal National Environmental Policy Act criteria as well.

There's a 30-day comment period, then there's a draft, we prepare the draft EIS. And during this period all the studies will be done, all the technical work will be done, and we'll be assembling and processing that technical information into an Environmental Impact Statement.

This draft EIS is then published, and there's a 45-day public comment period. And at this time there will be another public meeting and we will then review the details of the project and really talk about the issues, talk about the mitigation, talk about the analysis of the particular document.

So after the 45-day comment period, the public review of the document and agency review of the document, we start preparing the final EIS. And this final EIS takes into consideration all the comments that were received during the public comment period, all the comments that were received and responses to all those; and then a determination whether mitigation has been met and whether a final EIS can be provided for the particular project.

At that point that final EIS is then distributed to the community or to the agencies, basically, at this time. It's to all the Federal agencies, State agencies that are listed. So it's in all the libraries so that the public can comment on it.

This gets -- The final EIS then gets distributed to those agencies. And there are some key Federal agencies that have to review this final document, and that's Department of the Interior US Fish and Wildlife Service, because of the marine impacts, and as well as the National Environmental Protection Agency. So those are the two key Federal agencies that will be reviewing it.

This then gets published, the Notice of Availability or at the Federal level it's called a Record of

Decision. And this gets published in the -- The Record of Decision gets published in the "Federal Register" in Washington. The availability of the final EIS determination gets published under the State laws in the Environmental Notice -- the "Environmental Bulletin," pardon me, and there's a 60 -- at the State level there's a 60-day challenge period to the EIS.

At the time after that period ends, then the EIS is accepted by the Governor of the State of Hawaii, and then at that time we start processing the State and County permits.

So that's kind of an outline of the process. So as you can see, we're at the very early stages of the process. And I say that in order to just, I think, give you some reassurance that there will be other opportunities for public review. There will be full disclosure and discussion of comments of the technical reports that are provided in the EIS and of our Environmental Impact Statement as well. So we will be in front of the community again to discuss the findings of the EIS and to discuss in detail the impacts, the technical studies, and the mitigation that has been proposed for the project.

The environmental issues to be evaluated -- And I'll just briefly run through some of the environmental parameters -- the environmental, social, and economic parameters that we'll be reviewing in the EIS.

We'll be looking at the near shore marine environmental impacts. Edward K. Noda & Associates will be doing that portion of the work. Flora and fauna impacts; that is plant and wildlife impacts both on land and marine. Air quality and noise impacts. Scenic and open space impacts. Impacts to infrastructure; roadway, water, sewer and drainage. Impacts to socio-economic environment and public services. We do a consistency of the proposed improvements with State and County plans and policies. Impacts on surrounding land uses. Potential impacts to historic and cultural resources. Cumulative, that is secondary impacts resulting from the action and growth-induced impacts. And as well identification of measures to mitigate adverse impacts. So that's kind of what we will do during the preparation of the EIS process.

Again, then, just to remind you about the scoping objectives is to ensure that all significant issues related to this proposed action are identified and addressed. Comments should focus on proposing alternatives that may have less impacts while achieving similar transportation objectives. And identification of specific social, economic, and environmental issues to be evaluated in the Environmental Impact Statement.

Just to close, I would like to just give you

the County permits, the State permits, and the Federal permits that will be required for this proposed Ferry Pier Improvement Project.

At the County level the project will require a Special Management Area Use Permit. This is through the Maui Planning Commission. A Shoreline Setback Variance, because the proposed work will be within the shoreline setback area and the conservation area, which is on the State level. But a Shoreline Setback Variance again by the Maui Planning Commission. An Historic District Approval, and this is by the Cultural Resources Commission. There are two historic districts in Lahaina. This is in Historic District No. 1 and it's also within the Lahaina National Historic Landmark, so we will need the approval from the Cultural Resources Commission for the proposed action.

At the State level there's the Section 401 Water Quality Control, which is issued by the Department of Health. The Coastal Zone Management Consistency, which is approval through the Office of Planning. And there's a Conservation District Use Permit. Because the proposed improvements are in the conservation area that is on land -- submerged lands, then a Conservation District Use Permit will be required, and that's issued by the Department of Land and Natural Resources.

At the Federal level, a Department of Army permit will be required because there will be fill in national waters. Section 106 Consultation will be required. This is for the consultation with Native Hawaiian organizations that may be impacted by the proposed action. And this will require consultation with those organizations and a memorandum of agreement with those organizations. Paul Clayhorn through the Pacific Legacy, Incorporated will be carrying out the Section 106 Consultation. And then a Federal requirement, this is through National Historic Properties, and this is Section 4(f) review, which is, again, specific to the Federal Transit Authority or Federal Transit Administration that their plans and policies will not impact public recreation, open space, or national historic properties. So we have to do a Section 4(f) review and get approval from the Federal Transit Authority or Administration for that.

So that's sort of the background of the project to date, the purpose of the scoping that we're having tonight.

And for this meeting we've asked the court reporter to attend, and she will be giving a verbatim, I guess, report to us about all the comments that we receive tonight. And as well, if you feel uncomfortable, you know, speaking what you want to say or what you have to say in front of a crowd, you could -- the court reporter will be

available to take your testimony on a one-to-one basis as well.

So with that, I think at this point I would just like to open it up for comment. And we have a microphone. And it would be appreciated if you want to speak, if you could give your name, where you live, and what your comment is, that would be appreciated.

So thank you very much for coming and attending this scoping meeting.

If you have questions as well.

MS. ROBINSON: I'm just wondering, is this --

MR. HIRANO: Give your name.

MS. ROBERTSON: Sorry. Peg Robertson, Association of West Maui Democrats. And I teach art at Kapalua Senior Center and Lahaina Senior Center as well.

I have taken a lot of legislators down here to the bathrooms for about the last five years, so I'm glad to see improvement. I just have a couple of questions. Is this gray area cement? Is that gray area cement?

MR. HIRANO: Yes.

MS. ROBERTSON: Well, when you have that much cement in Lahaina, it isn't good.

MR. RICE: That's not cement. That's the lawn.

MR. HIRANO: I'm sorry.

MS. ROBERTSON: That's the lawn. I didn't know because this is all the same color. So this is cement, that's cement, but this is different, that's grass?

MR. HIRANO: What's there now.

MS. ROBERTSON: Okay, good. Because it is the same color.

MR. HIRANO: You noticed that; we didn't.

MS. ROBERTSON: Okay. Now, the bathrooms over there, how many sinks do you have? I notice you have like 12 toilets and how many sinks? Anybody know?

MR. HIRANO: Five sinks. For women, 12 water closets and five sinks.

MS. ROBERTSON: Okay. I didn't -- I couldn't -- Okay.

I'm wondering about pump stations. I went through -- Oh, I think it's been eight years ago when I started talking to Cayetano about the pump stations. How many pump stations are there now, and how many are we going to have when this whole multimillion dollar, billion dollar whatever is, is put in? How many pump stations?

MR. HIRANO: There are no pump stations in this particular proposal. This is the pier and maybe electricity out to the pier, telephone service, but --

MS. ROBERTSON: Do we have a pump station there now? Somebody help me out.

MR. HIRANO: There is a pump station there now, existing.

MS. ROBERTSON: One pump station there now. Is that -- As far as environmentally, is that going to be enough?

MR. HIRANO: Nothing is changing as far as the numbers of boats.

MS. ROBERTSON: I know.

MR. HIRANO: May or may not.

MR. RICE: The pump stations, bathrooms, the existing pier now are not being touched. All that you are adding here is the concrete -- called a slab -- for the pier. The bathroom, Lahaina bathrooms is a different project down the street.

MS. ROBERTSON: Right. I understand.

MR. RICE: There's no -- Unfortunately, the people who are on the pier need to walk down to the new comfort station. There are no facilities on this pier.

MS. ROBERTSON: Well, I'm talking pumping stations for the dock.

MR. RICE: No, just the existing one, the original existing one.

MS. ROBERTSON: There's no thought of putting in any more pump stations? Just the one?

MR. RICE: Not under the scope of this plan.

MS. ROBERTSON: I just -- I don't know how many boats, isn't there some certain number that you have to consider that you have to have more than one pump station? Not at all? Okay, just a question.

I noticed that you have parking for the disabled at the bathrooms down there. Is it two or three, Mr. Wong?

MR. WONG: Two.

MS. ROBERTSON: Two parking. So we're taking out some regular parking and putting in disabled. I have a good scar here; I was disabled for a year. But if you're taking out two, are you going to put two more in maybe by the library or something to replace? We keep taking out parking, taking out parking. And you've got disabled across the street, too, you know, directly across. Is there going to be any more parking replacing those two that you're taking out?

MR. HIRANO: Not in this plan, but you could make a comment.

MS. ROBERTSON: What?

MR. HIRANO: You can make your comment.

MS. ROBERTSON: Okay. That's my comment. I think we used to have 28 parking spaces around Lahaina -- I don't know, some of you can help me. I think you know how many parking spaces they took out the first -- when they fixed Front Street and all that stuff. We lost, you know,

like 30 parking spaces. And that's a big problem in Lahaina.

Okay. Sinks, bathrooms, I guess -- I guess that's about all. This water situation here when it's high tide and all that other stuff is all being considered, where -- this area through here?

MR. HIRANO: What is the concern?

MS. ROBERTSON: I guess my concern is we have -- we had some pretty big waves last year, and the big waves were going over the harbor and stuff like that. And I was just -- I was concerned about if --

MR. HIRANO: Waves coming in.

MS. ROBERTSON: How is this study for how big a wave? I'm sure there is some study that you have done.

MR. HIRANO: There will be.

MS. ROBERTSON: There will be. Okay, thanks.

MR. HIRANO: Mr. Chenowith, come around this way.

MR. CHENOWITH: You bet. I'll only take a moment. Thank you very much. I'll turn around so I can face you.

My name is Dave Chenowith. I live at 340 Front Street. I've been around a long time. I used to be harbormaster, so I know the area. I worked on our community plan. And, okay, so I've got a few -- couple comments.

A comfort station, I suggest you have about an eight-inch gap underneath the roof all the way around for good ventilation. The floor should have a slope so you can hose it out. I used to clean it.

The improvements to the harbor, one of the most practical ones I can think of is to take the sign at the loading dock and change the 30 minutes to 15 minutes. It will cut down the stress almost in half.

The next suggestion I have is that commercial boats that are sharing the loading dock or whatever, whenever they -- instead of going to the loading dock, they go to their slips.

And the next suggestion I have is, you have to consider that we're losing our view corridors that have not only a social impact and a quality of life impact about people in Lahaina, but look what's being drawn by -- painted by artists and what are tourists enjoying and what are the people that still live here that can still stand it want to see. They want to have some view corridors left. They want to still be able to see the mountain. Barely -- Not anymore. Along the Front Street and all along is walls now. Try to maintain our view corridors, whatever we do.

And I suggest that super-ferries and more than one cruise ship are just impossible for the area no matter what you do, because if you try to start building to service them, what you're trying to do here, you're going

to -- and I believe that you'll see the people in Kahului and Molokai, Lahaina have told in these meetings over and over they don't want all of this. Our Lahaina Community Plan limits the amount of people here in the district; the residents and the visitors.

And so that's all I want to say, is do some practical things like 15 minutes instead of 30 minutes, and don't do anything except make a really nice comfort station. Thank you.

MR. WARREN: Hello. My name is Tom Warren. I'm a Lahaina Harbor guy as well. And hi, everybody.

It seems this is going to happen. My concern is that it's predominantly for the cruise ships. Eric was trying to assure me that it wasn't, but I'm still not buying it. And I'm seeing the possibilities of right now they have the north face of the dock to use. With two more, potentially I see pandemonium.

The ferry boats on all four of the ferries, I use them, the local ferries, should be able to use that; but I just am wary of when the cruise ships pull in, how this is going to really alleviate any congestion. It's like if you build four lanes, you get four lanes of cars.

And just as a practical thing as well on the walkway between the new pier to the existing pier; say there is a cruise ship in and they're using the north face of the loading dock and say Expeditions pulls in and is off-loading passengers, that's going to be the only exit for the passengers. That off-loads them right into the restricted zone. I don't see how that's practical.

Right now the only way they can get on board or I can go down and get my six gallons of gas is from the southern side. I think there should be more thoughts to provisions for exiting the ferry boats while cruise ships are in. Hopefully by the time this project is completed, the cruise ships won't be here at all.

And my other thought was -- again, talking to Eric -- is they said that the north face of the new ferry pier may not be dredged so as not to accommodate a boat. And I can't see if you're going to do a project of this scale to not make sure that it's dredged so we get both sides. If we're going to do it, do it.

Thank you.

MR. WALSH: I'm Chris with Trilogy Excursions.

I talked to a couple guys, but I just -- one thing that we have a situation with, of course, is the surfers going in and out, so I didn't know if you addressed -- I talked to somebody else and they addressed some specific areas or something that might work out for the surfers. But I know that that's something that I don't want

to run over one.

MR. HIRANO: There is a provision. There is consideration of putting a platform on this side for the surfers, a small platform.

MR. WALSH: Okay, but then you end up with the same thing that's happening right now. They're going out right here in the traffic area, going to go out right there in the traffic area. So definitely a little more consideration of some sort.

And hopefully, one of the other things they have is they're always trying to shower off and using our hoses, which we don't mind, but does add to it.

And then I did want to echo the part about the cruise ships coming in, because that is one problem that we do have. When the cruise ships are in, we can't get to that one pump-out station. So I would really hope you guys would reconsider putting a pump-out station on the ferry side over there. I'm not sure, I haven't talked to the ferry guys, I don't know if they pump out in other areas or have that situation. But that's a lot of people they're carrying back and forth to the different islands, so it really is something that's very much needed, a pump-out station there. Longer hose on the one existing would work, too, especially during the cruise ships and also when the ferry's in there when we're on the other side of the existing one.

Yeah, the same thing; rerouting the ferry guests. You know, this thing looks pretty silly, just going to send them right into where the zone is right now when we have cruise ships in there. So that one is confusing me very much.

Then, also, you didn't address and I've heard rumor they were thinking of actually replacing the "Carthaginian" so it would even be going farther out.

MR. HIRANO: Yes. I mean, that -- that's up for consideration.

MR. WALSH: That's a consideration.

MR. HIRANO: I don't know. It's not --

MR. WALSH: You don't have to do environmental impact on your part?

MR. HIRANO: On which part?

MR. WALSH: Well, if they put the something farther out here, if they put another "Carthaginian."

MR. HIRANO: No, no, that's not in consideration.

MR. WALSH: Okay. Thank you.

MS. NICKELSON: My name is Del Nickelson and I'm a slip holder down in the harbor. I also am a commercial captain out of Lahaina Harbor. And I guess I have more questions than anything at this point. We keep calling it a ferry pier and then we keep bringing in the cruise ship part.

So the cruise ships will be using the ferry pier when they're coming in, or will the cruise ships still be using the north side of the loading dock and the ferry pier will simply be for the two ferries that we have coming in and out?

MR. HIRANO: I'll answer that one as best I can. If I can't, I'll ask Eric. But I think for clarification, the purpose of this project is to provide a ferry pier and to allow the ferries to use both sides of the pier, or maybe one side. But when the ferries are not using the pier, I believe it will be a policy of the Department of Land and Natural Resources Boating Division that other users can use the pier as well.

MS. NICKELSON: So mainly cruise ships, or they'll still be going to the north side?

MR. HIRANO: I don't think the -- kind of the operational policies of that have been worked out yet, but it's -- it'll be primarily for the ferries, and then other users can use the pier. And that means all. Not just the cruise ships, not just the commercial boaters, but the pleasure crafts as well.

MS. NICKELSON: Okay. Then on that note, if I can make a suggestion, it seems like the most congestion we have down at the harbor is when the cruise ships come in. And as the pump-out station's on the north side, there's a fuel station on the north side, the security at the harbor makes it really tough to get to the sole loading dock, particularly if you're a private boat owner, because you have commercial boats going in and out and they need to use it. So to me if we're going to -- This is from ferry funds from the Federal government, so this has nothing to do with cruise ships, just ferry funds; but there's no way we can combine the two together to make it available for the cruise ships as well?

MR. RICE: It's a multi-use pier, but, you're correct, it's ferry money. Priority will be for the ferry. Remember, that dock has no services on it. Most of the resident boats are going to want to use the existing dock where you have your fuel, your pump-outs, the parking where the people come, so that would be the preference. What it does is take some pressure off. You're adding at least one more face available to do that for everybody's use, and that just alleviates the pressure.

It's a little bit of -- It's a little safer not to have quite so many boats. The surfers will still do it. Surfers are surfers. I was one once, too. But at least it'll move them another 20, 30 feet away from the channel, and that should be a positive. Hopefully they'll go on around if we give them a little loading dock and what have you, a place to pull up on.

But essentially it is a multi-use thing, but

there is a preference for the ferries. The ferries want to run on a schedule and it makes it really easy because you can say there's a ferry due in now, everybody off. If there's nothing else happening, go in. The best thing we can do is keep the ferries regular. It's better for everybody.

MS. NICKELSON: Okay. And I had a question about the safety thing, because in the very beginning it said one of the reasons that we're addressing this whole thing is a safety issue. And I was just wondering what exactly safety -- I mean, I live at Lahaina Harbor, and as I walk around to my slip in the back, I'm falling through boards and falling off rails and things of that nature. And when you bring up safety, I'm just wondering, how did this become a priority over the other infrastructure that is probably far more unsafe than the major loading dock?

MR. RICE: Because this money is here, the other money isn't. But January 15th the legislature opens.

MS. NICKELSON: Okay.

MR. HIRANO: Thank you.

MS. LINDSEY: My name is Mary Helen Lindsey. I'm with the task force for the cruise ships, the Mayor's task force. And it has been -- We've gone out, we've been into Lahaina, the task force has, for the cruise ships. And almost all agreed, one cruise ship in at a time, not two. And, please, never three.

(Applause.)

MS. LINDSEY: Never, ever three.

Now, I have really -- not mixed emotions, but here, you know, I don't see anything on the paper that says -- You're going to Lanai, you're going to Kaunakakai; and you're not going to inform the people who are going to be using it. So I would like for you folks to do that as a courtesy to them, because they're the users.

MR. RICE: They're going to.

MS. LINDSEY: Okay. Both Kaunakakai and Manele, Lanai. So please put that on. Okay?

Now, secondly, the ferries all run on a schedule. You can see Molokai is outside, ready to come in, backing up, because they've had -- Before they didn't need to do that, but now they do. Hopefully this ferry appendage added will make them come in. And I use that very loosely.

Anyway, we want to take care of our Lanai and Molokai, mainly because plane fares are outrageously high. And there's going to be stopping on Lanai -- In fact, Aloha is not going to be going to Lanai. We've got a critical problem for those people. And, yes, they are very important for us because they're Maui County. They're not their own island in itself, it's under Maui County. Although this is DLNR that's doing it.

But we appreciate it and we have the -- We

have Linda Lingle's person right here that represents and will go back and give it to her. And Ralph -- George, rather. George is the one you need to talk to because he has the right lane right into the Mayor's -- the Governor's office.

And I assume because we've met with the people -- And I wear two hats, actually. Lahaina Restoration Foundation, we've met the people on the bathroom. And it has been horrors, especially in the courthouse, the flooding. And we've had a meeting with DLNR and the State architects, and they told us all about what's going to be happening. And that seems to be the only bathrooms available. Once they have implemented I believe in 19 -- I mean, at '06, is that correct, you're going to be starting that bathrooms?

UNIDENTIFIED SPEAKER: Around there.

MS. LINDSEY: I saw it. I read about it. It's not going to come any -- I mean, it would be great if it could come sooner, because it's desperate when you have people need to go to the bathroom and they can't get there. And if we have -- like we just had two cruise ships just a few weeks ago, and it was chaotic over there.

So if the ferries are on time, does that make the tenders the first persons to get in to use these that were built for the ferries? Who's going to monitor them to say the ferries are going to be going in or coming out? So who's going to say, do not use this? Will there be a sign, an enforcer? That's your duty, huh?

MR. HIRANO: The harbormaster.

MS. LINDSEY: Yeah, right there. So is that -- I didn't hear anything about that. Is there going to be a -- That's your duty?

MR. RICE: The cruise ships keep one of their officers on the dock to regulate the flow of their boats back and forth depending what the traffic is in the harbor. So, yeah, and that person works in conjunction with the harbormaster. The cruise ships maintain radios, walkie-talkies, so he can tell his people don't come, do come. The ferry's coming in, so keep the people on the boat for a half hour until they send the next one.

MS. LINDSEY: Okay. I hope -- I mean, written or in verse, it sounds good; but it's the actual activity that does work. Because if it does not work, then you're going to have a big, big problem, bigger than you're really going be able to handle, too.

So the next thing here that I didn't really see, the Army Corps of Engineers, is the sea wall that is where the ferry's going to be going loading and unloading, docking. You did the -- Did they do a study of the sea wall? How -- Is it going to be more pressure being put on the sea wall there? When I don't -- When I mean the sea wall, I mean

where the lighthouse is. You know, that's an ancient wall there. Has a study been done?

MR. HIRANO: The studies will be done. And that comment will go in to the engineers who will be reviewing that, looking at that. So that will be, as you said, a concern that was raised during this meeting, so we'll pass that along and have comment on that.

MS. LINDSEY: Okay. Thank you.

MR. MUNNS: Hi. My name is Josh, and I'm a boat captain and boat owner in Lahaina Harbor.

And it just seems to me that if this is for the ferries and money for the ferries, they should put the fuel in there for them. Because they're going to be using the north side to get fuel, but using this to get passengers. It seems to me if there's going to be a ferry pier, the ferries should do all their business there and not be coming to the other piers to use our facilities. If there's going to be a ferry pier, specifically funds for them, I think fuel will be a really good idea. It'd alleviate congestion for everybody else on our fuel pumps. That's about it.

MS. ROBERTSON: Sorry, I just thought of one more. Getting back to that drawing on the scale and everything, you had said that the new one is going to be 65-feet long by 35 feet; is that correct?

MR. RICE: It's mentioned on the -- on the top there.

MR. HIRANO: 114 feet.

MS. ROBERTSON: Oh, so it's going to 114 feet, so it's going to be the same. And I see 60 feet between. Okay. Thank you.

MR. HIRANO: Thank you.

MR. JUNG: Okay. I'm Dave Jung, president of Sea Life of Hawaii. I run the Molokai ferry. I've been running it since 1986.

We have some special challenges with our particular route. Molokai is a depressed island, has limited transportation back and forth between the islands. Really, the only way the kids can come and participate in sports on Maui or for the other teams to go back the other way is on the ferry. The ferry is incredibly cheap compared to airfare these days. The next time you try to fly to Molokai, the prices have gone through the roof.

Because the channel is so rough, we have to run large boats. You can't get by with 50-foot catamarans. You have to bite the bullet, run with 100-footers. We didn't ask for this ferry terminal. We were supposed to be given priority use into the loading dock. We try not to abuse it. We try to get in and out as quickly as possible.

But times have changed. And I started running out of Lahaina in the early '70's. In the early

'70's you could sit at the loading dock all day long, do your maintenance, there was no problem. Times have changed. And we keep loading and loading and loading more and more vessels on that loading dock. It's gotten to the point today where the local fisherman doesn't even want to go there. The pleasure boat doesn't have a chance to get in. And we're just increasing the use on the loading dock.

The natural thing to do is to make our facilities better. Although this is funding under the name of ferry usage, it really does benefit the whole harbor. Whether or not we have this extra pier doesn't really have an impact on the number of cruise ships that show up here. If -- We're going to be crowded no matter what until the community comes up with some sort of limit on the cruise ships. If we had 20 loading docks, would we end up with 15 cruise ships? That's possible. But I think it's a big mistake to include improved facilities for the harbor with the number of cruise ships that are visiting.

We kind of have a parallel with Hana. People in Hana really don't want to see a four-lane highway to Hana, so they're willing to suffer with a small, winding road. I think in the harbor we don't want substandard harbors, we want to have decent facilities. If we're going to limit the number of cruise ships in our facility, in our community, I think we're going to have to deal with it on a different level than having no harbor facilities. I think that would be a big mistake.

I think we have to look ahead as a community and control the number of visiting ships, not necessarily the number of piers or the number of pump-out stations. I'm all in support of improving the harbor facilities. I also wonder if some of the catamaran operators feel it's unsafe to load their catamarans on the back row slips like they used to do every day, that maybe we can use some of the ferry funding to upgrade other parts of the harbor facility. Because if you're asking people not to use the loading dock as often, it just makes sense you ought to maybe pay for a road on the back slip or good lighting or rebuild the piers or providing better electricity.

The bottom line is we've got a whole bunch of Federal money that can come in to benefit all of us. So I just hope all of us will get behind this project. And we'll just have to stay on top of how many cruise ships actually are going to show up, because the community -- like Dave Chenowith was saying, the community can only absorb so many visits. And that's kind of a separate topic. I hope we don't put the two together.

When you're out there in the Molokai channel or coming back and forth from Kaunakakai and we have to wait 15 minutes because we have cruise ship tenders running into

each other, it does cause a problem. I don't care how many piers we have, that's always going to be an issue. So let's have more piers and have it be an issue than less piers and have it be an issue. We're still going to have to address it. Thank you.

MR. WALKER: Hi, my name is Jimmy Walker. I've been living in Lahaina since 1949 -- '48, somewhere around there. My main concern --

How's this? Better? Okay.

My main concern is that wall. First of all, all the problems that the people from Lanai and us have to go through every time the boat is there and all this kind of stuff. There's no place for us to unload. We have to go and park at Prison Street parking lot and carry all of our stuff over because of the security.

But my main concern is the Hauola Rock and the wall. You're not going to touch the rock?

MR. HIRANO: No. It'll be on the existing pier.

MR. WALKER: Oh, okay. The oldies had a technique of setting stone and making a stone wall. If you want to see the difference between, just take a drive to the other side and look at all the new type of concrete that the ocean just eats away. So we cannot afford to have one of the last remaining places in our town disappear because of new techniques that come in, say it's going to be better and it isn't.

The other, like the one I mentioned already, is the problems that the people from Lanai, they come in -- This is on the ferry, the Hiraga or whatever the ferry name is --

UNIDENTIFIED SPEAKER: Expeditions.

MR. WALKER: Expeditions, there you go. I, usually, like I say, we go back and forth, my family comes back and forth from Lanai. And how you figure this? We all there early, all our bags all get ready to be loaded up on the boat, and here comes this van, all the tourists that come out of there and they go on the boat first because they have tee times. And the whole theory to get these things and all the approvals was taking care of the local people, and that is not happening. That's my main concern. Thank you.

MR. KANA(?): I just want to make about three quick points. One is that if you saw this Environmental Impact Statement preparation, and right on the cover it says that it's prepared for the State of Hawaii Department of Land and Natural Resources, who, by the way, also review their own plan and put comment to it. So that needs to be -- You all that are here need to be aware of that the person that's doing it approves it, also.

The second thing is that the Section 106 part

of the Federal requirements and the monies that came in says that the real review body should be the Federal Transit Authority, which is the FTA, not DLNR. So that has to be made a point of. You need to know that. It's very important because DLNR should not be part of the process.

The third point is that I would like to be considered as one of the consultants for the 106 when that comes up. I want -- We would intervene as our organization.

And for the record, my name is Akona Kana (sp?) with Friends of Mokuaia. Thank you. Sorry.

And, finally, I just want to say that we also -- at the last scoping meeting there was a big push toward not having the pier even added at Lahaina Harbor, which cannot take any more impact as-is, period, and that we look -- And there's a gentleman right there -- at an alternate place to put this one pier.

And if it's as said, your project objective needs to be revised because the way that you put it and what it said up here, it said this basically was for only ferries. Now, here, no, well, really, it's for everybody. But, no, no, but the scope was for ferries. So the overview, the project objective needs to be revised to really say what the objective is here.

And second is that you have not actually proposed, and it should be included in here, the alternative, which was that it was brought up -- and I think it is a great idea because it would alleviate traffic, for one thing, in and out of the harbor area. It is an existing area that was a former pier area, anyway. It would keep all of the ferries and all the tenders coming from the ships dumping people down on that side of town instead. And with access to instead of just Front Street, they got the whole cannery, Lahaina Cannery, to go to like as in Kahului where they can go over to Maui Mall.

So these are my suggestions. And everyone else needs to pay attention to who's proposing and who's approving, because that is going to cause some possible lawsuits because of that. Aloha.

MR. KE'EAUMOKU KAPU: Aloha. Ke'eaumoku Kapu. I'm here representing Kuleana Ku'ikaki.

Just some suggestions that basically you need to definitely take into consideration based upon 7-1 Native Tenant Rights. And it always boils down to Hawaiian traditional and customary rights based upon what's happening in that area.

And somebody also mentioned about the surfers going on those areas and going into the water. They have a right. Yeah? They all have a right. My suggestion is get rid of the expansion. Don't want it. Because reading that little book that they put together, it says in 2010 we have a

population of 24,664 on the west side alone. Crazy. Right now we got what; 16, 14,000 people on this west side alone. So what is that going to cause? We're creating sprawl right before our eyes, and we don't even see it.

The only thing we're blinded by is the money that we're going to be bringing in. Then at the same time we're forgetting about -- Don't forget about us, now. We're still around. 7-1 Native Tenant Rights. The only thing I can say to the Department of Land and Natural Resources is they have a custodial duty to protect, which they have failed to protect Hawaiian traditional and customary rights. And we will be here. We'll be a part of this. We ain't going away.

So anything -- whatever your expectations are, kala mai ia'u, which means I'm very sorry, but sometimes we'll be left out of the picture. Always left out of the picture. And we always see degradation, suffering, yeah. The people has the poorest health, poorest education, yeah. And this so-called money that's supposed to come from the Harbors Division goes to the 5(f)(c), the land trusts. And 5(f)(c), the land trusts, those monies are supposed to be allocated for Hawaiian Homestead, education, and health. We don't see nothing. So we don't get nothing.

The only thing we have left is our Hawaiian traditional and customary rights, 7-1 Native Tenant Rights. We'll be a part of this. We ain't going away. It's not happening. Mahalo.

MR. JOHNSTON: Hello. My name is Jim Johnston. I'm with Teralani Charters.

The big point that I would like to underline here is that whatever solutions come out of this, that we really work on the fuel delivery there. A lot of boats just need to come in, get fuel, get out. And a lot of times the fuel pumps just are not working. I know it's not particularly the State's business, but whatever solution we come up with, we should make sure there's adequate fuel delivery there.

If you go in to the south side to get fuel and the south and the middle pump are out, for example, you're on the south side and only the furthest one out is working, you're really hogging up space so other boats can't come in. It'd really help the flow a lot if the fuel pumps worked on a regular basis. And that's all I would like to say. Thank you.

MR. RUNYON: My name is Mark. I work for Trilogy Charters. One of the things that seems, whether or not this happens or not, there's always an issue with traffic control and flow in and out. If the expansion does happen, what is the possibility of having traffic control just like we do on the harbor days during at least an interim time to allow people to adjust for and, you know, take into

consideration other people's needs? What's the possibility from you, Hal, and your people as far as having some type of traffic control?

UNIDENTIFIED SPEAKER: Possible.

MR. RUNYON: Okay. Thank you.

MR. TISER(?): Aloha. Hello. My name is Albert Tiser (sp?). I was born in Kahului, raised in Lahaina all my life except when I had to go to Nam. Every time I see a ship out there; stink, the water. It's terrible. Every time I see out there, they don't care. The ships don't care. The business in Lahaina, they make their business, but they don't care about the environment.

Let's talk about the environment. We are part of that environment. We can't enjoy the environment. I lived in Lahaina, I was ten years old, I can remember jumping in the water, it was green water. No more. Can't even eat the fish off the breakwater because they stink.

So how can you tell -- How can I tell my grandchildren that this is good for them? The kala is the power, Haole. This land, Lahaina, is so rich with cultural stuff -- you guys don't even realize that -- because this was the capital. This was the capital of Hawaii then. From Kapalua to Ukumehame, right, grave sites all over this place. You guys live here 50 years, that doesn't make you kanaka, I'm sorry. You could be Portuguese, Japanese, Filipino; you guys have green card, you guys coming over. They're not taking care of Lahaina. They're not taking care of the local people.

My grandchildren, I don't dare let them swim anymore. 1987, my last time I swim the harbor, and all the way I had stink in my mouth, the piece of shit and shit shit. Today is worse. They get staph. Get the staph, cut the leg off. So how can you sit there telling me this environment is good for us? What about your grandchildren? How are you going to tell them that you going to give them this? My grandchildren, at least they can't say it's my fault that it's like this.

The environment, zero. Every time I see a cruise ship, all the shit they dump into the ocean. Just like Kahului. You can taste them. All you guys been here long time can taste the smell of the damn diesel shit. All these boats, they take people out to the other islands, they don't give a shit. I do for my grandchildren that will come here. Haole did this. This is heffa. This is not for us; it's for the money. We don't make money.

But the loss for my grandchildren is there. You guys pass this, you guys going to have to tell your grandchildren, your great grandchildren, because the water stinks. Heffa. You get sick, you get staph, all this crap. Even cut your leg off. Don't tell me all this is good for

us. Haole.

I'm sorry, I'm not here to yell at you guys, but Portuguese, Haole, Chinese, Japanese came here and it was beautiful. Water was sweet. Now, can you tell me you like the stink by the breakwater? Haole. The surfers take showers when they go out there when they go surf. And I know, I was a surfer. I was born 1949, I know. From Kapalua all the way to Ukumehame surf.

And the water stink and more stink every time a big cruise ship come in, but they don't care. All they care about making the revenues, giving Lahaina community revenues. But what about us that love the aina, love the water? We're not going to have that.

I'm sorry I yell. Not for you. It's my kapuna telling me to speak up. And my great grandchildren never come here. Mahalo.

MS. ROBERTSON: I know that the thing that's -- the thing that's bothered me for the last 20 years is safety-wise the electrical box that has no doors on it. It could easily be damaged. Someone could knock off all the electrical stuff in the harbor. Have you seen it? Well, I hope some of you go look at it. I mean, talk about terrorists and worried about security. All they have to do is go boom, boom, boom; and you guys will all be not able to function. So at least take a look at the electrical box.

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It's at the end of the harbor down there. Everybody knows where it is. They'll tell you where it is.

And we keep saying, you said to me that we'll consider the surfers after some time, but the next time I hope when they come in you'll have someplace for those steps to go down and show us, you know, old-time surfers. And I think it's a shame our kids, that's one thing they love to do here, and I think that that should be put into the plans.

It's like the senior center. They were going to put hot water in all the rooms, and then I started working there and there's no hot water. They said, Well, we can't do it now. So what I would like to do is get with some surfers to see where they would like to get a ladder or stairs down. So the next time you come down here, try to talk to the surfers and they can speak, you know, whatever. Thank you.

MR. FREELAND: My name is Keoki Freeland from the Lahaina Restoration Foundation.

First of all, I would like to ask Mich a question. This project takes place in a national historic landmark and funded by the federal government; therefore comes under that Section 106. And from what I understand under 106, federal agencies are to take into account the effect of this project as it might have on historic property. Which federal agencies are supposed to review this?

MR. HIRANO: Federal Transit Administration.

And it's through the contact with the State Historic Preservation Officer.

MR. FREELAND: Okay. So we'll look forward to hearing from them.

I do have a couple items that we're concerned about. In the far left corner over there outside the pier is the "Carthaginian," and that's roughly where you're talking about building the new pier. Most of the time the surf comes in from right to left and the finger pier protects what's out there, the "Carthaginian" or the so-called new pier.

MR. HIRANO: If you could point to it.

MR. FREELAND: Okay. Roughly you're talking about putting the pier in this area. Normally the surf comes this way and the finger pier protects that site. But sometimes the surf, when it gets big, it can come from this direction. So the concern that I'm suggesting here is what are you going to do to protect that pier when the surf is coming in this direction?

The other concern that we talked about in the stakeholder meeting and I want to mention it again is that when the surf is big, the reef from here all the way to Ma'alaea Wharf subsides from the waves coming over. The tide on the inside is higher than the outside and the only way the water can get out is through the channel. The water comes roaring out through here. So, again, if you're going to

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dredge in here, what effect will that dredging have relative to that roaring water coming out when the surf is big? Is it going to make the dredging useless, or is it going to enable erosion? And heaven forbid if that were to happen. What I'm suggesting is to look into that so that we don't have a problem later on.

And, finally, the other suggestion or concern that we have is that everybody knows, you know, we have a real mess inside here. Okay. We're talking about cleaning up this mess here, but what about, another person has suggested it, taking care of some of the problems outside of here? You know, you're going to have a lot of people coming through here, we're talking about increasing the flow of traffic through here. What about taking care of the problems on land like maybe having a good parking area and a shuttle system or controlling the traffic? Thank you.

MR. GENOSA: My name is Kyle Genosa. I'm the Maui County Director of Transportation. I just wanted to address the traffic and parking problem a little bit at least. As you may know, last week we held a bunch of public meetings around the County in preparation for coming up with a transit plan for the island of Maui -- well, really for the whole County.

And one of the things that we're currently looking at is having a circulator system within Lahaina that

would basically come down Front Street and try to bring the cars off out of the harbor area. And we're looking at possibly getting some satellite parking. We're still looking for where we could put a lot, but basically to have people park outside of the town and have a circulator system like a shuttle system take people from that external parking area and circulate within the town. So that's currently what we're looking at.

And we've got some federal money to buy buses and -- but that's separate from this harbor project or from the ferry project in terms of the money sources. But that's what we're looking at to try to address the traffic problem currently, is to just have like a circulator system like Keoki was mentioning. Thank you.

MR. KNIGHT: Well, as most of you know, I'm Steve Knight with Expeditions. And what do you think; support, not support? We definitely are supporting something to alleviate our problems in Lahaina Harbor. This particular idea, other than the loading situation here, the unloading ramp, and I'm not real sure about that, but basically what we would like is anything that could help us with the problems that we're having in Lahaina Harbor for unloading our passengers from Lanai, especially back and forth.

At the present time there is no place for them to even unload their cars from Costco goods, stuff going over to Lanai; luggage, golf clubs, everything like that. Cruise ship days, double cruise ship days, the security is so blocked. They've got all of their security cars parked out in front, all of the security cars parked. There were 14 cars the other day parked out right in front of the harbor in the security area. You can't even maneuver around there. You can't get in.

So if this situation, if the security barriers could be set up differently here where the access off of the ferry pier and over would -- could flow the traffic out or something like that, I think it would be wonderful. We're at a real situation now where we can't even get on the loading dock a lot of times. And as a Public Utility Commission operation, we're supposed to have preferential treatment on unloading and loading on the loading dock. If somebody at the dock loading or unloading their passengers or cleaning up or fueling or something like that could move off the loading dock so the ferry can come in. That's what's supposed to happen, but it's not being enforced. There's really no way to do that.

We've got three sides of a loading dock here that the cruise ships take up one side with the tenders, we've got a small area on the face, and then we've got the south side to utilize for the entire harbor on cruise ship days. And it's just almost impossible at times. You know,

sitting outside with 80, 90, 100 people on the ferry trying to stay on schedule, which we're mandated to do, and it just makes it impossible at times.

Somebody mentioned earlier to let the Lanai people know that this is in the making. They would welcome anything that could help us in this respect, which something like this would do. I don't know if this is the answer. I know this is a lot -- a big drop from the one of the initial options that we had with shops and harbor agent's office and all that on the top, which looks real nice, but this is really backing down. I think they're trying to -- I think they're trying to satisfy a lot of people and a lot of different opinions in this.

And whether this is the final answer that they will arrive at after the studies are made, this is just like the beginning steps trying to get something that at least we can go forward with. And with all the -- This is just the beginning of the study stage, so I'm sure there's going to be changes. I'm sure there's going to be -- It could have to do with the size of the pier. It could have to do with which areas are going to be dredged. It could have to do with the way people are unloaded off of the piers and into that area. And I'm sure it will have -- like the transportation, I'm sure it will have a lot to do with what's done up in this area for parking for traffic flow through;

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all that kind of stuff.

Yes, Expeditions especially supports a ferry pier. It's because of the ferry pier that we're able to get this money -- or because of the ferry that we're able to get this money. The ferry pier is one element of this money. This money is available year after year after year. The majority of this money went to Alaska for their ferry systems up there, and they've been very good at being able to cross the T's and dot the I's and get this money and it's been going up there for years and years and years.

And right now the money that we just captured over for Manele Harbor is the first time ever in Hawaii that any Federal transportation money has ever been designated into Hawaii. And we got $6 million for ferry, for ferry improvements in Manele Harbor. Okay. That is going to give us a covered waiting area for the ferry passengers. Okay. What's that going to cost? You know, 100,000, 150. We spent -- on our own money we spent close to $200,000 to build the existing ferry pier that we had over there in our own money, okay.

Now we're going to have a covered waiting area, which will be great for the people, but what it will also improve is complete paving throughout the harbor, parking lot paved; electricity, which we've never had at Manele Harbor; lighting; telephones; sewer system; on and on

and on, all with this money for the ferry system.

So you can see what will happen if we can start capturing this money for Lahaina Harbor based on the ferry terminal. It will just mushroom, branch out, and maybe the back -- the back row will see some of the benefits. The ferry has to park its tender over in slip 86, so that's part of the ferry system, so all of that back there can be redone eventually, you know.

And this is year after year these monies are available. It's not a one-time shot. But there is a lot involved in capturing the money and there's time deadlines and things like that. It was really on a fast track for the Manele project. Everybody worked in complete agreement. The community meetings that we've had, Manele Harbor advisory meetings, on and on and on, everybody was in complete agreement. It was basically just do it, just do it, just do it. And we did. And they are projecting that groundbreaking over there will happen sometime early 2006, but it's in the complete planning stage now and it's a good project.

So I hope that we can do something like that here. I hope that because of the ferry operating out of Lahaina Harbor that we will get some kind of a ferry pier that will be exclusive use for the ferry. And if other operations can use it during the times that the ferries aren't on the dock, well, that's great, too. But I would sure hate to see it be impacted by the cruise ships saying it's a golden opportunity to bring two more ships in here with all this room over here to use. And I just don't think that the FTA would let that happen with them giving all this money into the ferry terminal and the use of that.

So, anyway, that's all I've got to say. We can support it and hope we can get it down the road somehow. Thanks.

MR. HIRANO: Does anyone else have or want to say something about the project or have comments on the project?

Dave Chenowith, Jr.

MR. CHENOWITH: Hi. My name is David Chenowith, Jr. I do a lot of surfing. I'm over here from the mainland helping my dad right now. I used to surf -- and still do -- a lot in the '70's.

Where is that red firefly? Okay. Push that right there? Okay.

Right there the waves are big, big. That's where we usually pitched off in the '70's to paddle across over here, out over here. A lot of times we'd use the pier or the jetties out here and would paddle out here when it was big. What about the liability problem with this thing? The surfers are still going to be pitching out here and going across the channel here, and I was just kind of concerned

about that. Thank you.

UNIDENTIFIED SPEAKER: Well, one last word here. You know the old adage, use it or lose it. If we don't use this money, we're going to lose it. It would be a real shame. It's our harbor. The harbor users, let's get behind this and support it. If there's questions on how it's going to be used and how we administer it, then it's our responsibility to decide how we use it. Okay? That's a separate paddle, but let's just get this. Let's not let this money get away from us. It should benefit all of us. Thanks.

MR. HIRANO: I would like to just close the meeting now. And I would like to really thank every one of you who have come out and expressed your concerns, who have provided comments to us. It's not going to be an easy job for us to do the Environmental Impact Statement. There are certainly some heartfelt issues about this particular proposal. And we will be working with the community, we'll be working with the organizations and community groups and native organizations in order to work with them to get their concerns expressed and ways in which we could deal with those issues that have been raised this evening.

So I would like to thank you for the time you've spent and your interest in the project. So on behalf of the Department of Land and Natural Resources, I would like

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to just say thank you and drive safely. Good night.

(The proceedings were adjourned at 7:45 pm)

C E R T I F I C A T E

STATE OF HAWAII)
) SS.
CITY AND COUNTY OF MAUI)

I, Sandra J. Gran, Certified Shorthand Reporter for the State of Hawaii, hereby certify that the proceedings were taken down by me in machine shorthand and was thereafter reduced to typewritten form under my supervision; that the foregoing represents to the best of my ability, a true and correct transcript of the proceedings had in the foregoing matter.

I further certify that I am not attorney for any of the parties hereto, nor in any way concerned with the cause.

DATED this 21st day of December, 2004, in Maui, Hawaii.

Sandra J. Gran

Sandra J. Gran
Hawaii CSR 424
Notary Public for Hawaii
My Commission Expires: 5/14/08

SANDRA J. GRAN
Notary Public
State of Hawaii