DRAFT ENVIRONMENTAL ASSESSMENT

HILO BAYFRONT TRAILS

Hilo, County of Hawai‘i, State of Hawai‘i

January 2010

Prepared for:
Hawai‘i County
Department of Research and Development
25 Aupuni Street
Hilo, Hawai‘i 96720

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Various County and State rights-of-way adjacent to above parcels

South Hilo District, County of Hawai‘i, State of Hawai‘i

PROPOSING/
APPROVING AGENCY:

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Department of Research and Development
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CLASS OF ACTION:

Use of County Land and Funds
Use of State Land

This document is prepared pursuant to:

The Hawai‘i Environmental Protection Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
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SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Hilo Bayfront Trails Project would provide a variety of multimodal paths, pedestrian sidewalks, dedicated bicycle lanes, and shared roads for bicycles spanning the approximately two-mile distance between Hilo Harbor and the Wailuku River in Downtown Hilo. The project also includes loops for downtown, Wailoa River State Park and Bayfront Beach Park. The Hilo Bayfront Trails would provide a cohesive system of non-motorized transportation opportunities between Hilo Harbor and Downtown Hilo for both tourists and residents. It would complement and enhance the attributes of the Hilo Bayfront: dramatic views of Hilo Bay and Mauna Kea, green spaces, historical interest, cultural and community events, and a variety of recreational activities. Aside from the trails themselves, the project would build several new parking areas and interpretive signs denoting areas of interest.

The project directly involves 40 separate parcels of land and rights-of-way within 17 named County and State roadways. Landowners, businesses, citizen organizations and the general public have participated in developing the project in a series of meetings. Best management practices will be implemented to prevent erosion and sedimentation. The area is subject to both riverine and coastal flooding, including tsunami, but is already heavily used for recreation; structures are minimal, and no inappropriate development of floodplains or high hazard areas would occur. Valuable biological resources will not be adversely affected. The project has been designed with community input to enhance cultural resources and practices, which will be benefit from better and safer pedestrian and bicycle facilities. Signage explaining the significance of Hawaiian land divisions, historic events and current practices will increase resident and visitor understanding and appreciation of the host culture. The County will require that archaeological monitoring take place during any construction involving surface alteration. If archaeological resources, cultural items or human remains are encountered during development of the project site, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted.

PART 1: PROJECT LOCATION, PURPOSE AND NEED AND DESCRIPTION

1.1 Project Location and Purpose and Need

1.1.1 Project Location and Background

The bayfront of Hilo from Hilo Harbor to the Wailuku River offers stunning scenery, historical richness and diverse and unique recreation including fishing, canoe racing, soccer and surfing (Figures 1-2). The bayfront is centered on Hilo's longest and most important beach, almost a mile of black sand fringed by beach grass, ironwoods and coconut trees. Flanking this beach on the east are Hilo's visitor industry center on Banyan Drive and the island's major port, and to the west is the historic and still economically vibrant downtown. In its history, Hilo has experienced repeated inundation by tsunami, most notably in 1868, 1923, 1946, and 1960. The open landscape at the center is a partially a result– and also a perpetual reminder – of the awesome forces of nature and the tragedies inflicted by the devastating tsunamis.

The cultural and historical importance of the Hilo Bayfront matches its spectacular physical setting. Hilo was settled perhaps as early as 1,500 years ago by Polynesian voyagers. The coast near the Wailoa River, Alenaio Stream, the Waiolama wetlands, and the Wailuku River were ideal for village sites. Eventually, these natural waterways and wetlands were modified as fishponds and planting areas. The Waiolama marsh was used for a unique type of cultivation in which taro was grown in floating organic rafts. By the 1500s, Hilo was the center of power for early chiefs battling for control. There were also at least six *heiau* (temples) in the Hilo Bay area. Moku Ola (Coconut Island) was known as both a healing center, with its curative spring water, and a *pu'uhonua* (place of refuge) for *kapu* (law or stricture) breakers. The *'ili* (smaller land division) f Pi'opi'o became a royal precinct, and fish grown in ponds constructed in this area were off-limits to all but *ali'i* (nobles). When Captain George Vancouver arrived in Hilo Bay in 1794, Kamehameha was living at Pi'opi'o and preparing his fleet of canoes for his conquest of the other Hawaiian islands. Hilo played a prominent role in the long campaign of conquest of the islands by Kamehameha. The first major battle campaign after the ascendance of Kamehameha at Moku'ōhai took place at Hilo.

Between 1824 and 1848, Hilo became a significant center for foreign activities, mostly as a result of the establishment of religious mission stations by American missionaries, the first of which was located within the 'ili of Pi'opi'o near the bayfront. The first vocational school in what is now the United States was established in Hilo in 1837. Measles and smallpox epidemics decimated the local population and led to a consolidation of settlement along the northern half of the bay. A pier built in 1863 near the mouth of the Wailuku River became the focus for trade and commerce. During this time, Hilo Bay was the third most frequented port in Hawai'i for whaling vessels needing repairs and re-provisioning. Fertile uplands, plentiful water supply, and a good port helped Hilo become a major center for sugarcane production and export, which were the center of the economy until as late as the 1970s.

Figure 1
Project Location Airphoto Map

Between 1879 and 1948, the Waiākea Mill Company conducted mill operations at Waiākea Pond. Bagasse – a by-product of sugarcane – became a secondary industry, first as a fuel for the mills' boilers and then as the main ingredient for a wallboard product patented as Canec. A Canec plant opened in 1932 near the Waiākea Mill and flourished until a devastating 1960 fire ceased operations. Between 1899 and 1946, railroad infrastructure was built and maintained in the bayfront – first by Hilo Railroad Company and later by Hawaii Consolidated Railway, Ltd. – to transport sugarcane, lumber, stones, and passengers. There were tracks across the bayfront (where Bayfront Highway is now aligned), bridges over the Wailoa and Wailuku Rivers, wharves at Waiākea, and a roundhouse near Hoʻolulu Complex. The destruction of much of this infrastructure by the 1946 tsunami was so massive that Hawaii Consolidated Railway was forced to liquidate, and railroad operations ended in the bayfront. Construction of the Hilo breakwater on Blonde Reef took place between 1908 and 1929. Pier 1 was completed in 1913, Pier 2 in 1922, and Pier 3 in 1927. The 1946 and 1960 tsunami destroyed low-lying Downtown Hilo, Shinmachi (now part of Wailoa River State Park), and the once-thriving part of town on the Waiākea peninsula.

Figure 2 Photos of Locations in Hilo Bayfront Trails Planning Area

Top: Parking area off Ponahawai Street. Middle: Wailoa River. Bottom: Banyan Drive's existing state.

Centuries of traditional Hawaiian history along with the eras shaped by the missionaries, whalers and sugar planters are all manifest on this bayfront, which contains quaint and scenic reminders of these times, giving Hilo a unique historic character.

1.1.2 Project Purpose and Need

The Hilo Bayfront provides opportunities for a variety of recreational activities. However, it currently lacks a cohesive system of walkways or other pathways connecting Hilo Harbor and the recreational areas along Banyan Drive to the Bayfront Canoe area and Wailoa Park, and from there to Downtown Hilo. Users include residents engaged in recreational walking or cycling, those traveling on foot or bicycle from one activity or attraction to another, and visitors disembarking from cruise ships at Hilo's piers at Kūhio Street who would like to walk between downtown and the harbor. There is a clear need for pedestrian and bike trails that can complement and enhance the attributes of the Hilo Bayfront: dramatic views of Hilo Bay and Mauna Kea, green spaces, historic landscapes, cultural and community events, and a variety of recreational activities.

The Hilo Bayfront Trails project was begun through a grant from the Hawai‘i Tourism Authority through its Natural Resources Program. The County of Hawai‘i provided matching resources. The project is in keeping with the goals of the HTA program, which include improving value-added amenities at natural resource sites; exploring innovative means to repair, maintain and improve Hawai‘i's natural resources; raising awareness of all stakeholders about the responsible use of natural resources; and increasing collaboration among government agencies, the visitor industry and the community.

In a year-long collaborative process with key stakeholders and the public at large, the County of Hawai‘i, Department of Research and Development (R&D) supervised a consulting team from the Honolulu-based firm of Helber Hastert and Fee Planners, Inc. in preparing the Master Plan. The need for a comprehensive trails plan was identified and supported by extensive stakeholder outreach. The Hilo community formulated the following overarching goals:

- Enhance the area's natural beauty
- Increase access for residents and visitors
- Highlight the site's cultural significance
- Protect the fragile coastline and waterways surrounding the Hilo Bayfront

1.2 Project Description

The full Master Plan for the Hilo Bayfront Trails Project is available for review at the following website:

http://www.hcrc.info/community-planning/hilo/bayfront-trails

Project Elements

Figure 3 illustrates the overall features of the Master Plan. To avoid redundancy, detailed discussions of design features the project background are contained only within the Master Plan and simply summarized or referenced here. The community-based design process that led to the Master Plan developed a project with a number of desired elements that required additional investigation to determine feasibility. Where research done for this EA has concluded that some elements could not be practically implemented or required modification, they have been specially noted and justified to respect the community design process.

In overview, the Hilo Bayfront Trails Project would provide a variety of multimodal paths, pedestrian sidewalks, dedicated bicycle lanes and shared roads for bicycles spanning the approximately 2¼-mile distance between the entry road to Hilo Harbor on Kalaniana‘ole Avenue and the Wailuku River on the western side of Downtown Hilo (Figures 3 and 4). The project also proposes loops for the areas of downtown and Wailoa State Park and also a multimodal loop at the County’s Bayfront Beach Park. In addition to new or newly marked paths, the project includes several parking areas and up to 30 interpretive signs denoting areas of interest.

As discussed in Section 1.4, below, most alignments and amenities are located close to the bayfront and occur predominantly on public County and State road rights-of-way and other County and State lands. A few trail segments would require land purchases or easements.

Trail alignments provide the physical means for walking, running, biking or skating from one location to another within the project area. Trail amenities are located near the trail alignments to provide basic resources, trail information, and educational information about the natural and cultural resources of the project area. Some trail elements would be new to the project area; other trail elements already exist in the project area and would be “adopted” by the Hilo Bayfront Trails. The trail incorporates or interfaces with infrastructure being developed in separate ongoing or proposed County Department of Parks and Recreation projects: the Wailuku Riverwalk, Hilo Bayfront Beach Park Master Plan, the Reed’s Bay Beach Park improvements, (which include elements for Kūhiō Kalaniana‘ole Park), and Kaipalaoa Landing (see Figure 3 for locations).

The Hilo Bayfront Trails Master Plan accommodates pedestrians, bicycles, and other non-motorized vehicles with a variety of trail alignments. As a collection, the alignments are called *trails* to emphasize their recreational purpose and role in providing access to and enhancing views of the resources of the bayfront. All alignments would be paved. Links between types of alignments have been carefully considered to maximize the connectivity of the entire network and adopt existing infrastructure wherever possible. Several types of trail alignments are planned:

- ***Shared Use Paths***: Although some existing infrastructure in the bayfront is currently shared by pedestrians, bicycles, and other non-motorized vehicles, the Hilo Bayfront Trails shared use paths would be the first in the bayfront specially designed to

accommodate multiple uses. The Master Plan includes more than six miles of shared use paths, which provide a continuous alignment from Moʻoheau Bus Terminal in Downtown Hilo to the future cruise ship passenger gate at Hilo Harbor. This system of off-road alignments is intended primarily for recreational walkers, joggers, bicyclists, in-line skaters, skateboarders, wheelchairs (motorized and non-motorized), and other non-motorized vehicles as permitted by County code and park regulations. A special symbol is used on the Master Plan to distinguish the proposed shared use path that is incorporated from *Bike Plan Hawaiʻi 2003*. Some segments of the shared use paths are dependent on the purchase of privately owned parcels and may require later implementation. Although not strictly required for the project, an important connector for the shared use path system is the segment on the makai side of State Highway 19 over Wailoa Bridge, which was strongly supported by the community.

Bicycle Facilities: On-road road trail alignments for bicycles include bike lanes, bicycle routes, bikeways, and signed shared roads. Potential locations for bicycle facilities were informed by public input, site observations, analysis, and a review of alignments proposed in *Bike Plan Hawaiʻi 2003*. All bicycle facilities proposed for the project area in *Bike Plan Hawaiʻi 2003* are shown on the Master Plan, but not all of them have been highlighted for implementation by the Hilo Bayfront Trails project. The Master Plan also incorporates existing bicycle facilities: bikeways (signed shoulders for use by bicycles) along Kalanianaʻole Street and Kamehameha Avenue and bike lanes along Kanoelehua Avenue. In total, the Master Plan comprises four miles of bicycle lanes, nearly a mile of signed shared roads, and almost four miles of bicycle routes. On-road bicycle facilities connect with the shared use paths in several locations. Except on Wailuku Drive, all on-road bicycle facilities are located on both sides of the street. Bicycle routes and signed shared roads are essentially the same; the County uses the term bicycle route, and *Bike Plan Hawaiʻi 2003* uses the term signed shared road.

- ***Pedestrian Walkways***: Pedestrian walkways are a combination of over three miles of existing walkways and nearly one mile of new walkways. Nearly all pedestrian walkways are located in transportation rights-of-way, and both existing and new walkways would be identified as components of Hilo Bayfront Trails by special horizontal trail markings. Pedestrian walkways connect with the shared use paths in many locations and may be used interchangeably.

- ***Crosswalks:*** Existing crosswalks are utilized by trail alignments wherever possible to link trail segments across streets; new crosswalks are located at intersections only, at the intersections of Banyan Drive/Banyan Way, Banyan Drive/Keliipio Street, and Kalanianaʻole Avenue and Kūhio Street. It should be noted that the crosswalk proposed in the Master Plan between the Waiānuenue Avenue-Kamehameha Avenue intersection and Bayfront Highway, which received widespread community support at all three public meetings because it would provide a legal connection to/from Kaipalaoa Landing and Bayfront Highway, would be completed as part of a new, separate project that will create

HILO BAYFRONT TRAILS

Draft Master Trails Plan

28 May 2009

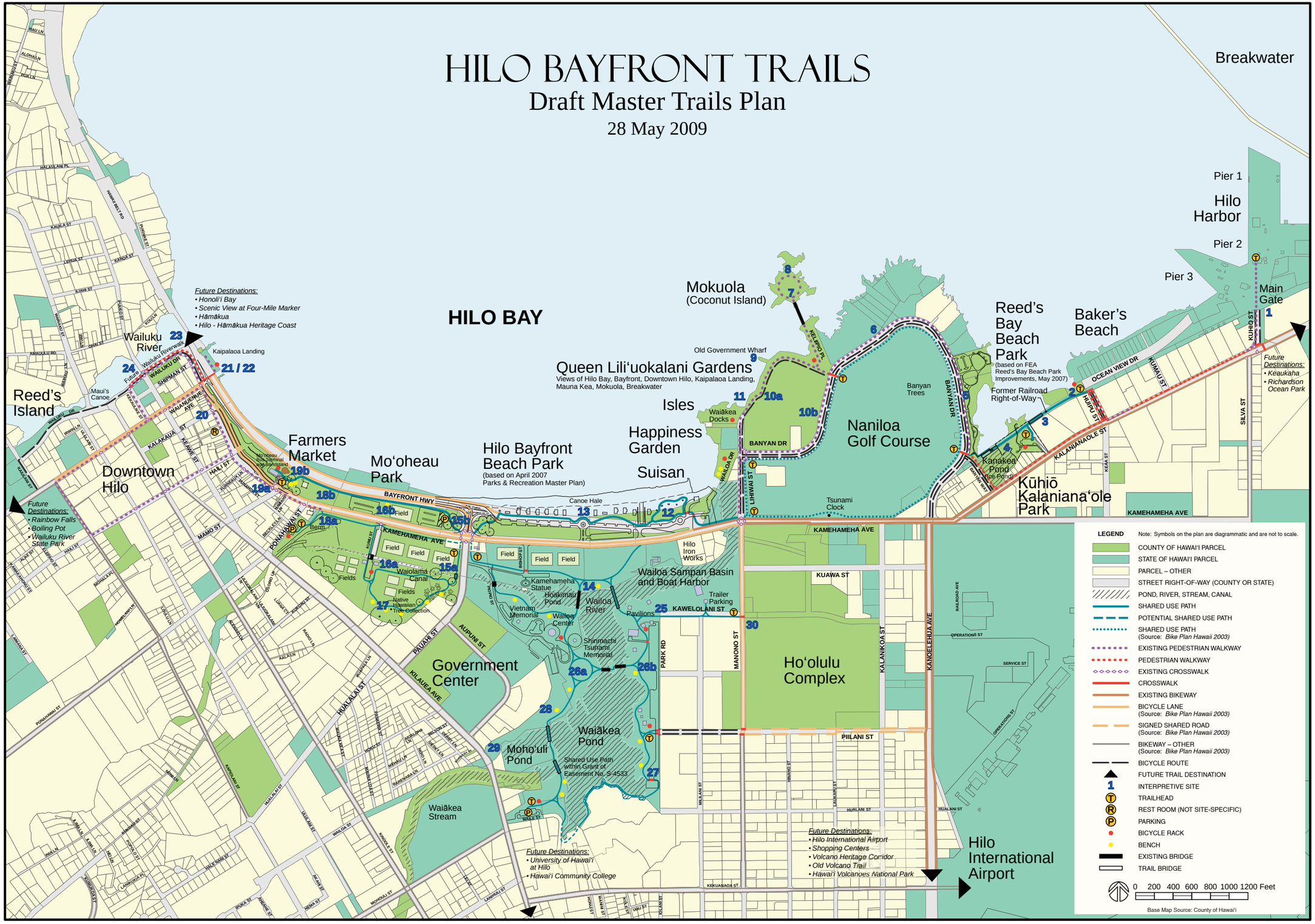

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Figure 4a Typical Trail Section

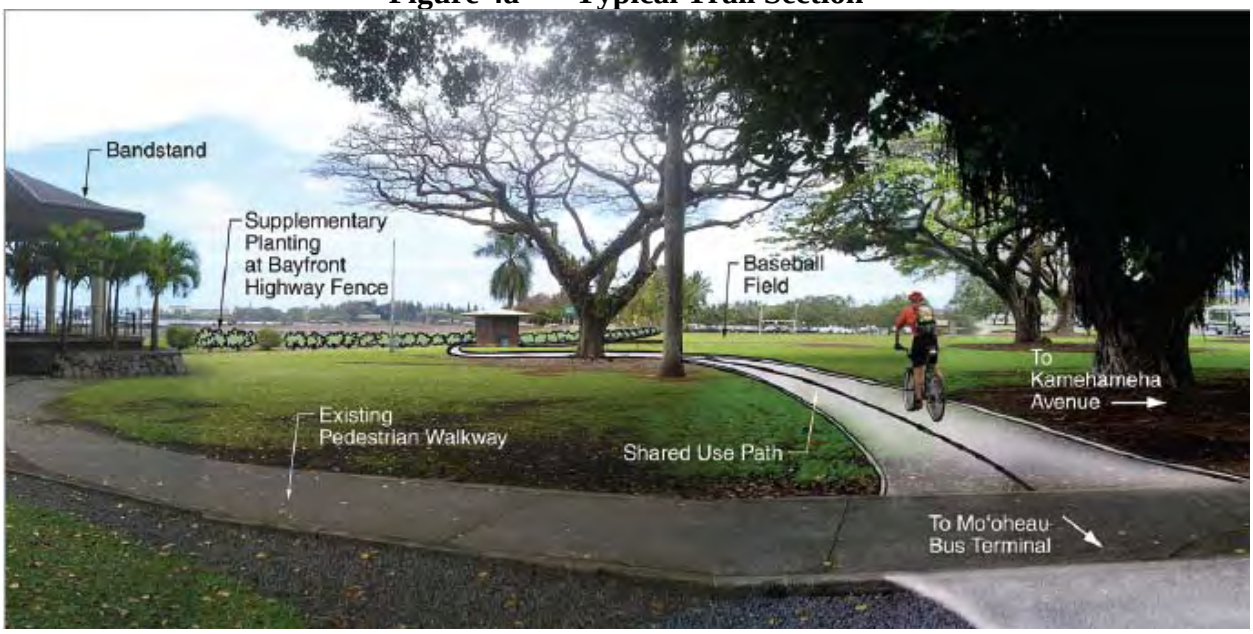
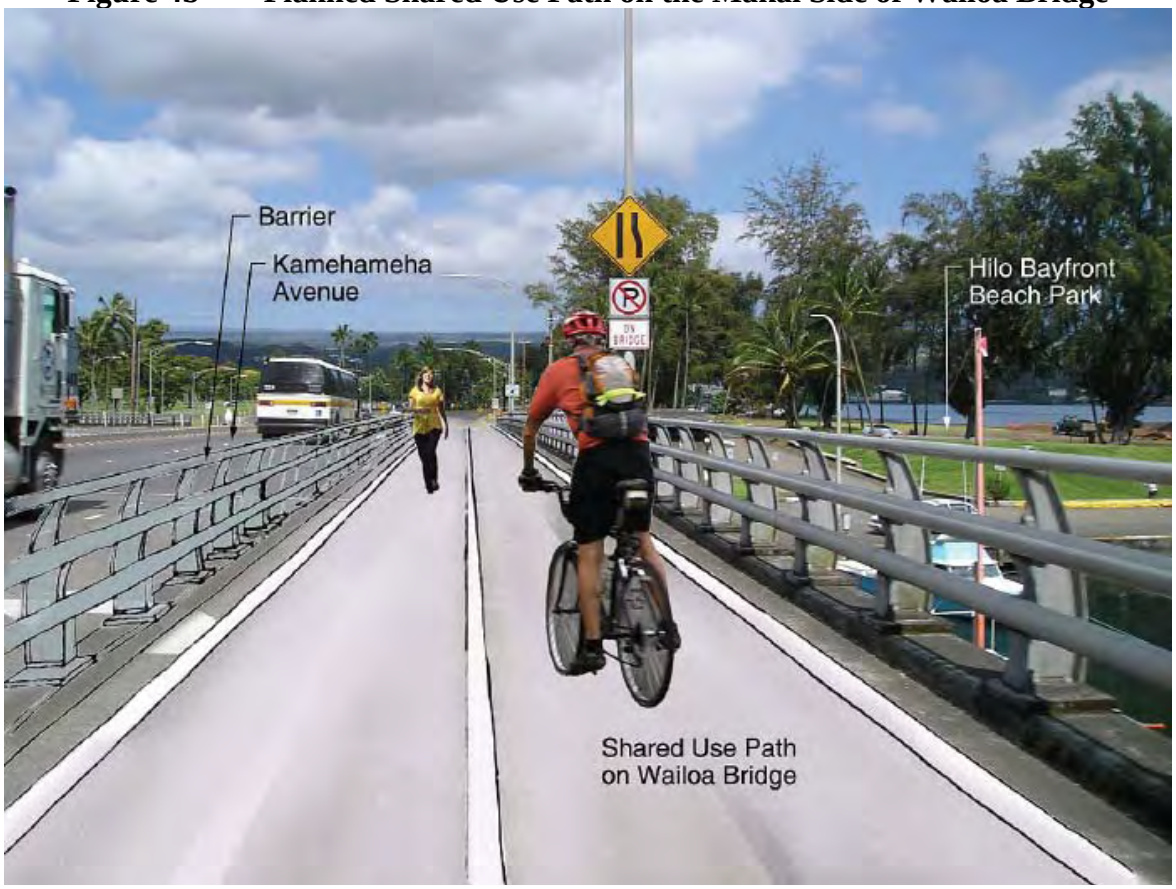


Figure 4b Planned Shared Use Path on the Makai Side of Wailoa Bridge



Source: Master Plan. Graphics are computer generated; existing condition on Wailoa Bridge is sidewalk with bike lane and no barriers.

Figure 4c
Conceptual Trailhead Signage and Logo

Source: Master Plan. Signage is superimposed on existing signs in Hilo Bayfront area. Logo would be emplaced in sidewalk.

a park at Kaipalaoa Landing, and its design and analysis of its function have not been included in this EA.

In addition to trails, several types of trail amenities have been incorporated into the Hilo Bayfront Trails Master Plan to complement and supplement the many existing park amenities that are already available along the trail alignments. The reader may consult the Master Plan for trail area-specific descriptions and design guidelines for trail amenities. Trail amenities include:

- ***Trailhead Signage***: The Master Plan includes 13 trailhead signs to identify the entrances to shared use paths of the Hilo Bayfront Trails. Attendees at public meetings helped select the sign design, which includes the use of lava rock and a roof for the protection of the signage and trail users reading the signage, similar to some existing signs in the Hilo Bayfront area (Figure 4c). Where parks already have entrance signs, the Hilo Bayfront Trails trailhead signs would not duplicate the signage and would instead use trail markings to identify the alignments.

- ***Interpretive Sites with Signage***: One of the most important contributions of the trails project is the interpretation signage for 30 sites (Table 1). Signage would be placed near significant sites at the best locations for respectfully viewing the cultural and natural resources being interpreted. The Master Plan lists and describes each site and depicts the community's preferred interpretive signage concept.

- ***Trail Markings***: Along shared use paths, on-road bicycle facilities, and pedestrian walkways, special markings would be used to identify the trail alignments. Horizontal markings – instead of vertical signage – would minimize the visual impact of trail identification on the natural beauty of the bayfront. The community voting process selected the trail marking concept of bronze trail logo medallions (Figure 4c) and painted line connectors. Distance markings would also be applied to trail alignments, and trailhead signs would include mileage information for the entire trail system.

- ***Ahupua'a/'Ili Plaques***: The traditional Hawaiian land divisions lend important context to the historical, cultural and natural environment of the trail. The Hilo Bayfront spans six ahupua'a and the 'ili of Pi'opi'o. Plaques would be embedded in trail paving at several boundaries, informing trail users which land division they are leaving and which they are entering, to enrich the connection of past and present. Interpretive signage would describe the significance of the *ahupua'a* and *'ili* land units

- ***Bicycle Racks:*** The availability of safe and convenient parking is as critical for bicyclists as it is for motorists. Thus, the Master Plan provides thirteen bicycle rack locations across the bayfront. All but two are sited adjacent to motorist parking to create "staging areas" for bicyclists, and each location is intended to accommodate several bicycles and possibly more than one bicycle rack, depending on the conditions at each site.

Table 1 Interpretive Sites of the Hilo Bayfront Trails Project

Site No.	Themes/Subjects for Interpretation
1	Harbor: Hilo's early trade and commerce. Development of harbor facilities. Sugar trade.
2	Abandoned Railroad Right-of-Way: 1878 act signed by King Kalākaua promoted the construction of railroads. Railroad important for carrying passengers as well as goods, most importantly sugarcane. Tsunami of April 1, 1946, shut down the railroad in Hilo.
3	Fishponds: Ancient uses and historic uses.
4	Kanakea/Ice Pond: Traditional and modern uses.
5	Banyan Drive: Trees planted starting in 1933 honoring important visitors and others.
6	Makaokū: Traditional name for the area. Once the location of a significant and unique heiau. Discussion of *heiau* and associated ritual.
7	Moku Ola (general): *Puʻuhonua*, healing waters.
8	Moku Ola (specific): Kaulaʻināiwi, Puaʻakāheka.
9	Mauna Kea/Hilo Town: Clear day sign to see the entire landscape from coastal zone to mountain peak (from the realm [*wao*] of man to the realm of the gods).
10a-b	Queen Liliʻuokalani Gardens: Traditionally, Waihonu Pond. History of modern gardens.
11	Breakwater: Designed to calm the waters of the harbor, not as a protective measure against tsunami. Constructed between 1908 and 1929.
12	Hilo Iron Works Building: Hilo Iron Works in business from 1865 to 1983. Building is a C. W. Dickey design.
13	Hilo Bay: Traditionally called *Hilo One*. *Hilo*, the first moon phase, is mirrored in the shape of the bay, which housed Kamehameha's canoe fleets and remains the location of a recreational canoe fleet.
14	Ili Piʻopiʻo: Hilo residence of Kamehameha. Later Japanese community of Shinmachi, which was devastated by the April 1, 1946, tsunami. Never rebuilt and now used for sports fields.
15a-b	Waiākea/Kūkūau 1: *Ahupuaʻa* boundary.
16a-b	Kūkūau 1/Kūkūau 2: *Ahupuaʻa* boundary.
17	Agricultural (kipi) Area: River diversion into channel and unique form of agriculture.
18a-b	Kūkūau 2/Ponohawai: *Ahupuaʻa* boundary.
19	Ponohawai/Punahoa 2: *Ahupuaʻa* boundary and Punahoa 1 Ahupuaʻa. Waiolama, former marsh.
20	Punahoa 2/Piʻihonua: *Ahupuaʻa* boundary.
21	Hilo Landing/Pier: Built and rebuilt between 1863 and 1890 at the foot of Waiānuenue Avenue.
22	Kaipalaoa Heiau: Located in this general vicinity. Tied to ʻUmi and Kamehameha I and Liholiho. Destroyed in Kuakini's (1820s) time.
23	Piʻihonua/Wailuku River: *Ahupuaʻa* boundary. Wailuku means "waters of destruction." Accurate physical description and distinction. Home to Hina.
24	Maui's Canoe: Maui/Moʻo Kuna story.
25	Wailoa River/Small Boat Harbor: Former estuary area of the Waiākea Stream. Currently the Wailoa Sampan Basin and Small Boat Harbor.
26a-b	Chiefly Hawaiian Fishponds: Waiākea-Mohoʻuli-Waiāhole-Kalepolepo. Collectively these ponds were stocked with the favorite fishes of the ruling chief and were considered to be significant places reserved for royal use.
27	Waiākea Mill: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use.
28	Waiākea Mill/Mohoʻuli Pond: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use. Wall dividing traditional pond boundaries.
29	Kalepolepo: *ʻIli* boundary with Piʻopiʻo. Location of a former fishpond. Legendary competition grounds for Hilo chiefs. Ka-Miki story.
30	Hoʻolulu Complex: History of recreational facilities in this location, starting with the opening of Hoʻolulu Park in 1900 and including the Merrie Monarch Festival venue: the Edith Kanakaʻole Multi-Purpose Stadium.

- ***Benches:*** A number of benches are proposed in the Master Plan throughout the project site in order to increase the opportunities for resting on the trail and enjoying sites. Benches have been sited to take advantage of scenic views as well as activities. The Master Plan includes a provision for the community to donate memorial benches with engraved plaques.

- ***Restroom Facilities***: The project area is well-equipped with restroom facilities that are located evenly across the bayfront. In addition, three new restroom facilities are included in County Department of Parks and Recreation projects: Hilo Bayfront Beach Park, Reed's Bay Beach Park, and Kūhiō Kalaniana‘ole Park. Based on this assessment and the community's concern about the security and maintenance of existing facilities, the Master Plan includes only one additional restroom facility, in Downtown Hilo, the plan for which is to utilize an existing facility (yet to be identified) through a public-private agreement.

- ***Supplementary Parking***: Incorporated into the Hilo Bayfront Trails Master Plan are two supplementary parking lots at the Waiolama Canal area and Maile Street (for the trailhead for the shared use path around Waiākea Pond), in addition to a parking renovation for accommodating the shared use path at Mo‘oheau Park.

- ***Supplementary Water Fountains***: The Master Plan includes water fountains at existing restroom facilities that are not already equipped with these amenities.

- ***Supplementary Planting***: Although the project area abounds with plantings, including exceptional trees protected by County ordinance, there are locations where supplementary plantings are planned in order to enhance the trail setting while complementing the existing beauty of the project area. Of note on the Master Plan is a native Hawaiian tree collection along the upper edge of Waiolama Canal Area. This cultural resource would educate trail users about what was likely growing in the project area before the land was used for agriculture and other development. Interpretive Site 17 in this location could incorporate an explanation about the tree collection. The trees would also create a shade amenity for spectators of nearby recreational activities and those appreciating views of the bayfront from this elevated vantage point.

Project Standards

The Hilo Bayfront Trails Master Plan trail alignments – shared use paths, pedestrian walkways, and bicycle facilities (which may be bicycle lanes, signed shared roads, or bicycle routes) – would be designed in conformance with the following standards:

- Requirements of the U.S. Department of Transportation, State Department of Transportation, and the County of Hawai‘i.

- Requirements of Hawai‘i Revised Statutes Section 103-50 and the American with Disabilities Act (ADA).
- Design guidelines established by the American Association of State Highway and Transportation Officials (AASHTO), in particular the Guide for the Development of Bicycle Facilities (1999).
- U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices (MUTCD), in particular Part 9: Traffic Controls for Bicycle Facilities (2003Edition) (http://mutcd/fhwa.dot.gov/).

All shared use paths would be designed for two-way travel of pedestrians, bicycles, and other nonmotorized vehicles, per the AASHTO Guide for the Development of Bicycle Facilities (1999) (see Figure 5). Shared use paths should also conform to the following design guidelines:

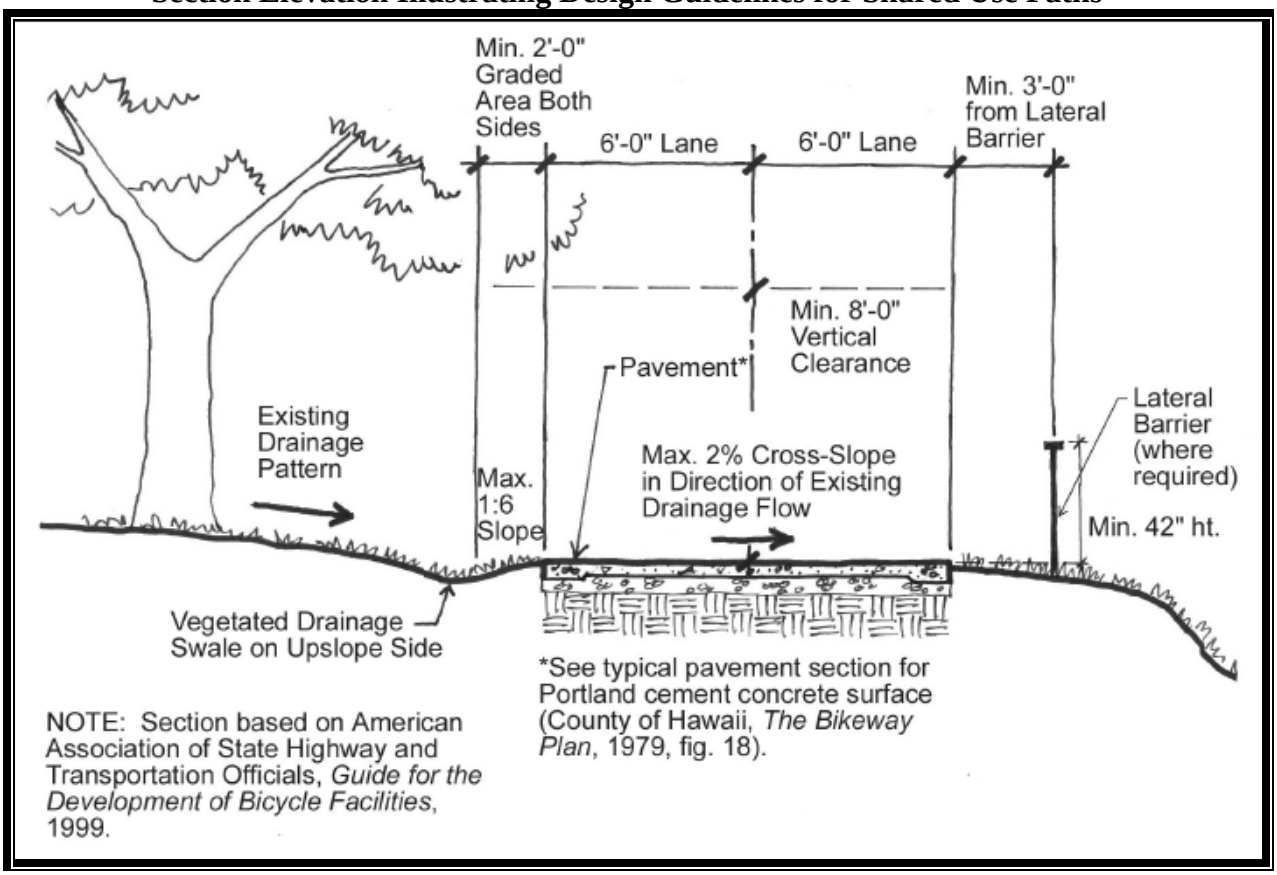
- Shared use paths would be a minimum of five feet from roadways (per AASHTO guidelines), with a landscape buffer, barrier, or grade difference reinforcing the separation.
- Shared use paths would be a reasonable distance from the edges of water bodies. Seasonal/tidal variations in water level have been factored in during final design.
- Final design of the shared use paths would respect the location of existing trees and landscape features and maintain a reasonable distance from tree trunks to minimize root damage during construction.
- As part of final design, tests would be conducted on representative samples of soil to determine their level of stability and the presence of expansive soils. The weight of maintenance, emergency, and other heavy vehicles that may need to utilize or cross shared use paths would be taken into consideration in the design of shared use paths.
- Shared use path alignments would account for existing drainage patterns.
- The approaches of shared use paths to roadways would be designed in close coordination with the Department of Public Works and the State Department of Transportation, Highways Division, as path-roadway intersections are often the most critical issue in shared use path design.
- Adequate approach distances would be provided at bridges.

The Hilo Bayfront Trails Master Plan would be submitted to the Facility Access Unit of the Disability and Communication Access Board DCAB for review and recommendations in order to ensure compliance with Hawai‘i Revised Statues (HRS) 103-50 and Hawai‘i Administrative Rules (HAR) Chapters 11-216 and 11-217.

Description of Key Trail Segments

The most environmentally relevant details for individual portions of the trail are provided below:

Figure 5
Section Elevation Illustrating Design Guidelines for Shared Use Paths



- ***Hilo Harbor to Banyan Way***. At its eastern end, the project begins at Kūhio Street, the entrance to Hilo Harbor, where cruise ship passengers currently disembark. Subject to coordination with DOT, the trail may also include improvements within Hilo Harbor for a pedestrian connection between the Pier 1 shed and the Kūhiō Street gate to move pedestrians away from the dangers of walking between parked cars and heavy traffic congestion on boat days. From Kūhio Street, the trail is a shared use path that travels westward along Kalaniana‘ole Street to Banyan Way and then to Banyan Drive. The Master Plan indicated a different route that would have traversed the shoreline and Kūhio-Kalaniana‘ole County Park and would have required three bridges (although only two were noted) over inlets in Reed’s Bay. Key to this route was a $1.2 million bridge that the County Department of Parks and Recreation proposed to build connecting Kūhio-Kalaniana‘ole Park and the developing Reed’s Bay Beach Park. This aspect of the Reed’s Bay Beach Park Improvements project has been cancelled, and therefore the route has been modified to use the existing route along Kalaniana‘ole Street. If the bridge is ever built, the original route can be reconsidered. As shown in Figure 3, this would include a block-long loop down Huipū Street (a paper road east of the Orchid Manor apartments) and a route along the former railroad right-of-way, which would necessitate two

additional bridges across a fishpond inlet and a *hau* (*Hibiscus tiliaceus*) wetlands. *It should be emphasized that this shoreline route is not analyzed in the current EA*. Because of potential effects to wetlands, other waters of the U.S. and archaeological resources, such a route would require additional study and environmental documentation and number of permits from State and federal agencies.

- ***Banyan Way Through Banyan Drive to Manono Street***. Between these points there is the existing walkway along Banyan Drive and around the Waiākea Peninsula, with a scenic 0.6-mile loop around Queen Lili‘uokalani Gardens and out to Moku Ola (Coconut Island). The Queen Lili‘uokalani Gardens loop is probably the most well-used exercise walking area in Hilo, and also supports joggers and dog-walkers. The interior is a celebrated Japanese garden with ponds, small gazebos, plantings, and rock work, used for picnics, fishing, and as a scenic backdrop for photo occasions like weddings and graduations. The addition of a scenic and functional trail around the remainder of the Banyan Peninsula would expand the recreational area and better integrate it with not only the hotel center of Hilo but also the adjacent neighborhoods beyond the Civic Center. The Hilo Bayfront Trails project includes a proposed shared use path on the interior of Banyan Drive and along Kamehameha Avenue mauka of the peninsula, making a complete 1.4-mile circle around the peninsula’s Naniloa Golf Course. Existing parks in this segment include Reed’s Bay Beach Park, Coconut Island Park, and Queen Lili‘uokalani Gardens (all County), the County recreational area known informally as “Isles”, and a small County recreation area called Happiness Gardens.

- ***Wailoa Bridge to Pauahi Street***. From the western intersection of Banyan Drive and Kamehameha Avenue, the project features a shared use path extending west and makai of Kamehameha Avenue before looping toward the shore and the Hilo Bayfront Beach Park and the vicinity of existing canoe *halau*. This almost one-mile stretch of black sand, fringed by beach grass, ironwoods and coconut trees, is the focus for canoe racing and also supports kayaking, windsurfing, thrill craft and small sailboat launching. There is generally ample parking (except during the well-attended canoe races) and this area could serve as the heart of the Hilo Bayfront Trails, a good jumping-off point to park a vehicle and walk or bicycle east or west. This segment includes all of Hilo Bayfront Beach Park.

- ***Pauahi Street to Downtown***. The multi-use path continues in a westerly direction, moving mauka of the Bayfront Highway at the Pauahi Street intersection, continuing to the vicinity of the Hilo Farmers Market on Mamo Street in Downtown Hilo. County recreational areas here include various multi-use playing fields between Kamehameha Avenue and Bayfront Highway and Mo’oheau Park.

- ***Wailoa State Park Loop***. The project includes a variety of new multi-use pathway loops extending mauka, which would be accessed from existing sidewalks along Pauahi Street. One would circle Waiākea Pond in Wailoa State Park and a portion of the Wailoa River, making use of three existing bridges and one more to be constructed, with side routes to Manono Street to the east and Kilauea Avenue to the southwest. While the State Park sometimes sees heavy use near the two large pavilions and the King Kamehameha Statue, some portions of the park appear overgrown and lack paths, and pedestrian and bicycle circulation is currently confusing. The Hilo Bayfront Trails project aims to provide clear, useable, safe and scenic circulation on the 2.5-mile perimeter around the entire park, with additional cross-park routes. Most of the route in the Wailoa State Park loop would occur on existing trails, streets, or across park lawns. Several areas would require some vegetation removal, and one area would require acquisition of either property or easements (see Figure 3). As originally planned, the trail would make a straight line between the pavilions at Wailoa State Park and Manono Street along Kawelolani Street, a "paper road" that is County property. This would involve clearing of a minimum 25-foot wide (for trail cross-section and maintenance) by 800-foot long strip of non-native forest vegetation. This segment of the trail is now planned to be shifted between 50 to 100 feet north to the cleared margin of Wailoa State Park. The most complex and uncertain part of the loop trail involves the area between Kilauea Avenue and the trail around the shore of Waiākea Pond in front of Waiākea Villas. The current plan is to utilize the berm on the south side of the Waiākea Drainage canal to connect back to a section of Wailoa Park. From here, the trail would acquire an easement on the private road Maile Street (TMK 2-2-53:19) to connect to TMK 2-2-053:20, an overgrown private parcel from which an easement would be acquired or which would be purchased to build a trail. The County is in discussion with the owners of these properties regarding arrangements. In order to create a loop without these connections, the trail would be have to occupy a route on over a mile of surface streets on Kilauea Avenue, Kekuanaoa Street, Mililani Street and Hualani Street, the majority of which lacks sidewalks. Without use of these private properties, then, the loop is unlikely to be closed, making property acquisition or access easements critical.

- ***County Soccer Fields at Waiolama Loop***. A roughly one-mile loop would circle a portion of the playfields mauka of the Waiolama Canal on the west side of Pauahi Street, with a side route along the mauka side of Kamehameha Avenue and along Ponahawai Street to Kilauea Avenue. This would integrate the County playing fields with the trail system.

- ***Downtown Hilo***. In Downtown Hilo, the project includes use of existing sidewalks that would be marked to clearly guide visitors along the historic and cultural attractions of Hilo's Bayfront and up Haili Street and Waiānuenue Avenue (see markers in Figure 4c). The project also includes several proposed parking areas, a restroom facility in an as-yet unidentified location downtown, trailhead signs, and interpretive signs.

Related Projects

Ongoing or planned projects (see Figure 3) that would interface with the Hilo Bayfront Trails project include:

- ***Hilo Bayfront Beach Park***. As discussed previously, this half-mile of black sand fringed by coconut groves is East Hawai'i's center for canoe racing and other activities such as launching kayaks, windsurfers, thrill craft and small sailboats. The County has long allowed canoe clubs to build "temporary" (i.e., moveable) structures at their own expense for storing canoes and other club-related activities. However, these structures lack building permits, and because of their location within the VE Flood Zone, they would not be able to receive permits with their current design. Therefore the County is developing a master plan for Hilo Bayfront Beach Park that includes new *halau* structures for canoe clubs, one-man canoe storage and sailing clubs, a new regatta judges' stand combined with one of the canoe *halau*, a new restroom, picnic pavilions, and improved park access, parking and traffic circulation. An EA is in preparation.

- ***Reed's Bay Beach***. The park is currently maintained at a minimal level, lacks landscaping, and there are no barriers to restrain vehicles from driving on the beach, which produces a safety hazard and adversely affects water quality. The project involves accessible walkways traversing the entire site; seven small pavilions; a restroom and storage structure with shower area; a 51-stall parking lot; removal of existing structures; drinking fountains and trash receptacles; landscaping; and removal of manmade obstructions in the shoreline area. The project would improve a unique recreational resource for the Hilo community, enhance the attractiveness of the area, and allow for a greater diversity of uses. It would also improve safety and protect water quality and beach resources. The project is planned for construction in two or more phases. State and federal EAs have been completed and a Special Management Area permit application is in preparation.

- ***Wailuku Riverwalk*.** This project, which has no firm timetable, would build a pedestrian walkway with interpretive signage extending from Waiānuenue Avenue along Kamehameha Avenue to its terminus at the Wailuku River and then along the river to Kekaulike Street where it would connect with Waiānuenue Avenue. Landscaping and selective tree removal could open up vistas of the Wailuku River.

- ***Kaipalaoa Landing***. This small area makai of Highway 19 between Waiānuenue Avenue and the Singing Bridge is the access for an important surfing beach. Surfers and citizen groups have long lobbied to make the area a park, with picnic tables, a shower and restroom, lighting, and pedestrian safety improvements to make it more accessible from downtown. As noted above, the crosswalk proposed in the Master Plan between the Waiānuenue Avenue-Kamehameha Avenue intersection and Bayfront Highway will be designed and analyzed as part of an EA for Kaipalaoa Landing.

Key Differences Between Project as Presented in This EA and Master Plan

It should be noted that the project advanced for consideration in this EA has evolved from the description in the Master Plan as a result of close examination of cost and environmental tradeoffs associated with some of the Master Plan's options. Notable differences include:

- Elimination, at least for the foreseeable future, of the two bridges and railroad right-of-way portion of the route near Reed's Bay. Aside from the cancellation of a key element (the bridge between Kūhio-Kalaniana‘ole Park and Reed's Bay Park) of this route that was to have been completed by another project, other issues would have made construction of this route difficult. The two bridges would have added many hundreds of thousands of dollars to the project and would also have necessitated extensive, costly, and uncertain federal permit applications for activities within wetlands and tidal waters. The shared-signed route has been relocated to Kalaniana‘ole Avenue.

- Elimination of bridges across Mohouli Pond in favor of a route along Kilauea Avenue. Consultation with the Hawai‘i State Department of Land and Natural Resources, Division of Forestry and Wildlife, as part of the EA determined that the bridges across Mohouli Pond would pose a highly adverse impact to migratory birds, which have their most significant protected habitat in Hilo in the areas that were planned for the bridges.

- Minor rerouting of the portion of the trail from Wailoa Park east that would have cleared and utilized the paper road known as Kawelolani Street about 50 to 100 feet north to the cleared margin of Wailoa State Park. Wailoa State Park provides a more scenic and secure alternative that would cost far less to build and maintain than a path through the forest that would have necessitated cutting a number of large trees. If the County ever clears Kawelolani Street for some other purpose, the route could be relocated.

- ***Kaipalaoa Landing***. The crosswalk budgeted in the Master Plan between the Waiānuenue Avenue and Bayfront Highway will be designed and analyzed as part of an EA for Kaipalaoa Landing and thus has been removed from the EA budget in Table 2.

It is important to note that, although generally environmentally benign, the project ranges over a very wide area and consists of many actions. As the project is implemented, minor changes in location and features are likely. Such changes cannot be fully anticipated in this document. If

any are major enough to induce substantially different or more severe impacts, appropriate environmental analysis will be undertaken in conformance with applicable laws and regulations.

1.3 Environmental Assessment Process

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawai‘i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR), is the basis for the environmental impact process in the State of Hawai‘i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to 13 specific criteria. Part 4 of this document states the finding (anticipated, in Draft EA) that no significant impacts are expected to occur; Part 5 lists each criterion and presents the findings for each made by the Hawai‘i County Department of Research and Development, the proposing agency. If, after considering comments to the Draft EA, the proposing agency confirms that no significant impacts are expected, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to occur. If the agency concludes that significant impacts are expected to occur, then an Environmental Impact Statement (EIS) is prepared.

1.4 Public Involvement and Agency Coordination

A consulting team from the Honolulu-based firm of Helber Hastert and Fee Planners, Inc. prepared a master plan with the help of an informal advisory committee selected by the County R&D and consisting of County, State and federal officials and representatives from key stakeholder groups including canoe clubs and youth and adult soccer leagues. In coordination with R&D, the committee mapped the extent of the project area, determined the project phasing and schedule, defined the planning criteria, and selected the planning consultant. The process involved three public workshop meetings that were heavily advertised in a variety of media and drew substantial attendance. The following is a partial list of agencies and organizations were consulted in developing the Master Plan and/or in preparing the EA.

<u>Federal</u>:

Department of Agriculture, NRCS (Steve Skipper)*

<u>State</u>:

Connections New Century Charter School (Kaholo Dagumen)*
Department of Health, Environmental Programs Office
Department of Land and Natural Resources, Land Division (Wesley Matsunaga)*
Department of Land and Natural Resources, DOBOR (Nancy Murphy)*
Department of Land and Natural Resources, Comm. on Water Res. Mgmt.
Department of Land and Natural Resources, Director and Chair
Department of Land and Natural Resources, State Historic Preservation Division
Department of Transportation (Stanley Tamura)*
Office of Hawaiian Affairs, Honolulu, and East Hawai‘i (Lukella Ruddle)*
University of Hawai‘i at Hilo (Harry Yada)*

County:

County Councilmember Dennis Onishi*
Environmental Management
Mass Transit Agency (Tom Brown)*
Mayor's Office (Char Shigemura)*
Parks and Recreation Department (James Komata and Clayton Honma)*
Planning Department (Crystal Atkins and Susan Gagorik)*
Police Department (Lt. Jason Cortez)*
Public Works Department (Keone Thompson and Ron Thiel)*
Water Supply

Organizations:

EnVision Downtown Hilo 2025
Hilo Downtown Improvement Association (Sam Puluʻole)*
Hawaiʻi Island Chamber of Commerce
Kanoelehua Industrial Area Association
Keaukaha Community Association*
Path Hawaiʻi (Laura Dierenfield)*
Sierra Club
VisionKeepers

Private Individuals:

Leonard Bisel*	Sandy Bonk*	Ian Birnie*
Debbie Chang	Gayle Cho*	Pat Engelhard*
Neil Erickson*	Ken Fujiyama	Stan Lawrence
Jeff Melrose	Jon Olson	Tim Rees

*Indicates advisory board member

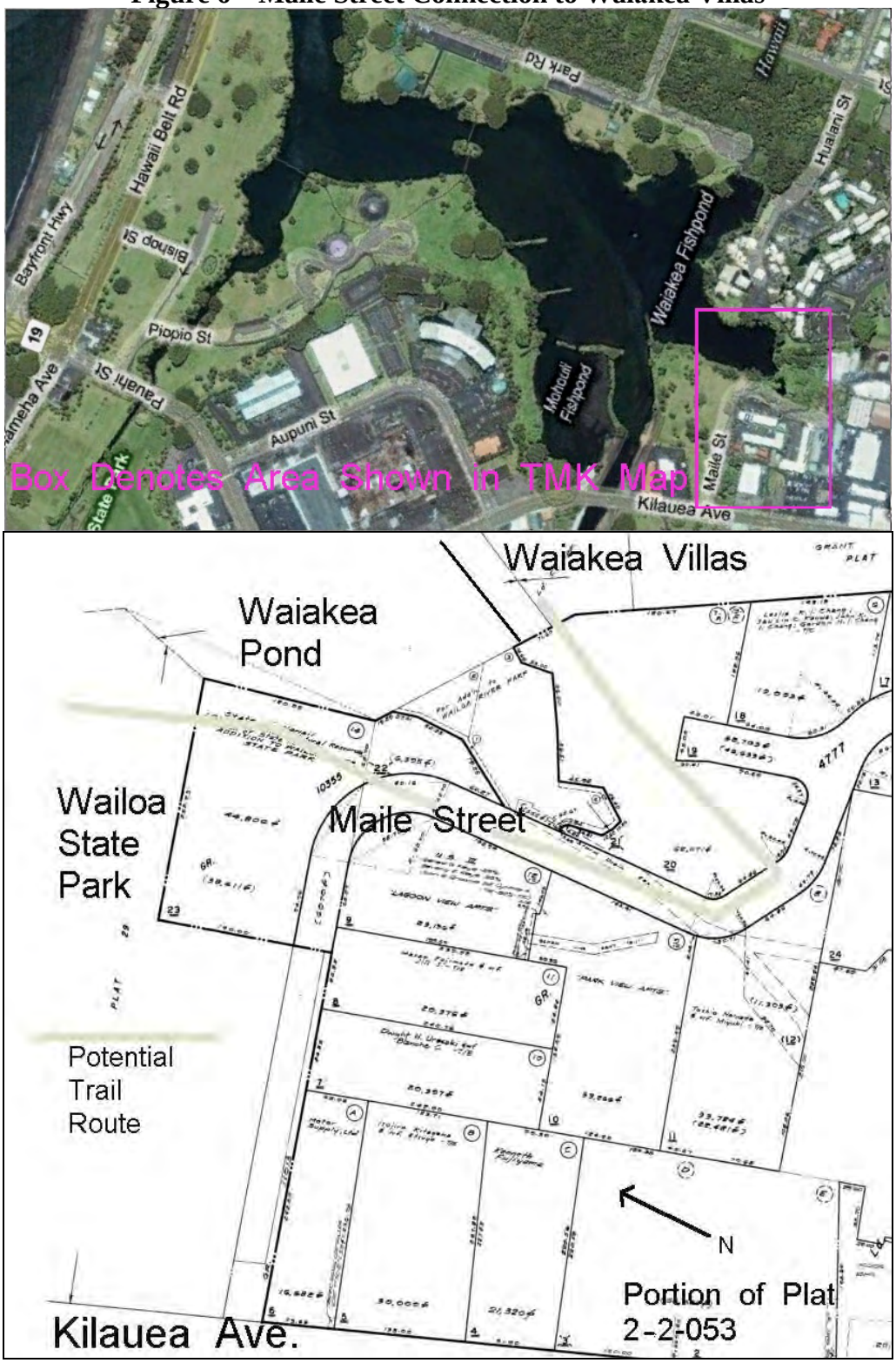
1.5 Property Ownership

The project directly involves 40 separate parcels of land and rights-of-way within 17 named County and State roadways (see Appendix 2 for listing of properties and pertinent actions). Most alignments and amenities are located close to the bayfront and occur predominantly on public County and State road rights-of-way and other County and State lands. A few trail segments would require land purchases or easements.

Although the trail can be built without any acquisition of private property, additional easements or purchases from several properties would promote a more efficient trail. These include:

- Purchase of the current and former gas stations on the corner of Kamehameha Avenue and Pauahi Street (TMKs 2-2-004:025 and 060) (see Figure 3). Acquisition of the entire property is ultimately a goal in order to provide the room for a shared use path, which is incompatible with use as a gas station with multiple driveways. *Environmental clearances for these properties, however, are not included as part of this EA.*

Figure 6 Maile Street Connection to Waiākea Villas



Source: Hawaii County Real Property Tax Maps; Aerial image © Microsoft Virtual Earth

- Purchase of an easement on Maile Street (TMK 2-2-053:019) and either property or easement on a lot connecting Maile Street to Waiākea Villas (TMK 2-2-053:020) (Figure 6). Though often thought of as public, Maile Street from Wailoa State Park to Kekuanaoa Street is private, servicing various businesses and apartments. Parcel 20 is a vacant, 52,071-sf lot that could serve as a vital connection around Waiākea Pond. Without use of this connection, the trail would require over a 0.8-mile detour on unsuitable surface streets via Kilauea Avenue and Kekuanaoa Street to connect back to Waiākea Pond.

1.6 Cost and Funding

Table 5.1 of the Master Plan presents costs estimated with information available at the time the plan was developed; these are shown in the second column of Table 2 in this EA. Revised costs based on elements of the project that have been removed from consideration or modified are listed in the third column.

The County of Hawai‘i, which is responsible for obtaining funds for trail implementation, is researching capital improvement project funding, grants, fundraising, and federal monies; not all funding is intended to come from local taxpayers. Community members at public meetings supported fundraising through donated memorial benches and custom-engraved bricks for trail marking. Fun runs or “Walks for the Trails” could also be organized to raise funds as well as awareness about the purpose and benefits of the trails system. Fundraising could be integrated with the interpretive component of the trails project by organizing a lecture series on the history of the bayfront and collecting donations at the door. Many parks and public facilities across the country are at least partially funded through non-profit conservancies, which receive funds from individuals and corporations. In addition to supporting a trails conservancy, local businesses could support the implementation of specific elements of the trails such as interpretive signage or street trees. Federal funding could also be sought through the National Scenic Byways Program, which was mandated by the Intermodal Surface Transportation Act of 1991 (ISTEA). To be designated as a National Scenic Byway, a road must have at least one of six regionally significant scenic byway intrinsic qualities: scenic, natural, historic, cultural, archeological, or recreational. The County R&D has already actively supported various organizations on Hawai‘i Island in laying groundwork for eligibility in this program. Federal funding may require additional environmental compliance subject to the National Environmental Policy Act (NEPA) and the administrative rules of the agency providing funding.

1.7 Implementation

Planning Phase Implementation

With the Master Plan completed, emphasis has shifted to achieving land use and other agency approvals for the project. These actions must be completed before the final design and construction phases of the project can commence. The major elements of this phase include this Environmental Assessment (EA) and a Special Management Area (SMA) Use Permit. The Hilo Bayfront Trails Master Plan, revised as appropriate, is being used as the basis for preparing

Table 2
Cost Estimate for Trail Action Design and Construction

Area	Master Plan Cost*	If Revised for EA, Cost
Kalaniana‘ole Street: Banyan Way-Kūhiō St	$737,900	---
Waiolama Canal Area	$2,018,400	---
Downtown Hilo (rights-of-way) [1]	$323,100[1]	---
Wailoa Bridge (State right-of-way)	$87,500	---
Kaipalaoa Landing	$7,500.00	---
Mo‘oheau Park	$496,300	---
Wailoa River State Recreation Area [2]	$8,106,500	$5,293,700
Hilo Bayfront Beach Park	$16,000	---
Naniloa Golf Course	$746,400	---
Happiness Garden	$2,200	---
Isles	$800	---
Queen Lili‘uokalani Gardens	$50,100	---
Moku Ola (Coconut Island)	$29,200	---
Reed’s Bay Beach Park	$9,200	---
Kanakea Pond Boardwalk and Deck	$182,000	---
Kūhiō Kalaniana‘ole Park	$113,600	---
Reed’s Bay Area Parcel 2-1-6:79	$115,400	---
Hilo Harbor: Short-Term	$6,100	---
Hilo Harbor: Long-Term	$500	---
Bayfront Highway	$1,032,400	$32,400
Kamehameha Avenue: State Right-of-Way	$5,400	---
Kawelolani Street [3]	$154,700	$104,700
Pi‘ilani Street	$21,200	---
Manono Street	$131,000	---
Lihiwai Street: Kamehameha Ave.-Queen Lili‘uokalani Gardens	$17,100	---
Banyan Drive: Lihiwai St.-Banyan Way	$795,800	---
Banyan Drive: Banyan Way-Kamehameha Ave.	$7,100	---
Banyan Way: Banyan Dr.-Kalaniana‘ole St.	$48,000	---
Former Railroad Right-of-Way [4]	$1,240,500	$167,500
Huipū Street	$8,400	$0
Kūhiō Street	$17,800	---
Total	$16,528,100[5]	$11,583,900
Total (including 15% design and construction contingencies)	$19,007,300[5]	$13,321,500

*rounded from Master Plan.
[1] This cost includes improvements on Kamehameha Avenue from Waiānuenue Avenue to the state-owned portion of Kamehameha Avenue. The cost for the crosswalk from the project area to Kaipalaoa Landing will be estimated as part of the Kaipalaoa Landing project and is not proposed or included here.
[2] Eliminating two bridges across Mohouli Pond, adding 0.2 miles of trail.
[3] Slightly longer trail with less landclearing cost. [4] Elimination of costs associated with bridge and railroad ROW.
[5] Differs slightly from Master Plan due to rounding.

Department of Research and Development, would continue to manage the planning phase of the Hilo Bayfront Trails project in close collaboration with other County departments.

Significant portions of the trail system are located on land owned by various State agencies. As identified earlier in this chapter, these include the State of Hawai‘i Department of Transportation, Harbors Division and Highways Division; and the State of Hawai‘i Department of Land and Natural Resources, Division of State Parks, Division of Boating and Outdoor Recreation, and Land Division. A representative of each agency has served as a member of the Stakeholder Advisory Committee, and they are knowledgeable about the history of the project. Various agreements can be sought with these State agencies to formalize the allowance of the trail improvements, including a Memorandum of Agreement (MOA), a Memorandum of Understanding (MOU), or an easement. Given the scale of the improvements, an Executive Order (EO) of the governor transferring ownership of the property to an appropriate County agency is unlikely. It will be important for these agreements to be made well in advance of design, so the County is assured of the State’s cooperation in a timely manner.

Priorities for Implementation

Based on community sentiment as measured at public meetings, the Master Plan consultant identified the following priorities for implementation:

1. Trail alignments/features along Kalaniana‘ole Street and near Hilo Harbor
2. Trail alignments/features in Waiolama Canal Area
3. Trail alignments/features in Downtown Hilo
4. Trail alignments/features on Wailoa Bridge
5. Trail alignments/features in Mo‘oheau Park
6. Trail signage and markings

Implementation Phasing Considerations

Various considerations will determine the actual phasing of implementation. For example, the relationship of available funding to the cost of implementing discrete projects may affect timing. The ease or difficulty of agency coordination may also impact implementation order. Coordination with other design and construction projects in the bayfront – particularly the Department of Parks and Recreation’s Reed’s Bay Beach Park improvement, Hilo Bayfront Beach Park redevelopment, and Wailuku Riverfront development – will affect the timing of trail implementation. Parcel and right-of-way ownership will affect implementation order as well. Potential shared use paths in Waiolama Canal Area and Wailoa River State Recreation Area would require obtaining the use of private property. This could occur as condemnation or negotiation of an easement, or these parcels could be made available for purchase by the owners.

Ease of implementation may result in some projects being designed and constructed long before other trail actions can move forward. The Stakeholder Advisory Committee could be reactivated

to make recommendations regarding implementation priorities. As members of a multi-agency group that have worked well together in the planning phase of the Hilo Bayfront Trails project, they are equipped with expertise and experience.

Maintenance

The County recognizes that maintenance and security of trail alignments and amenities will present challenges, and is relying on structures such as "Friends of Hilo Bayfront Trails" and a trail conservancy to supplement County funds and manpower for trail maintenance.

In additional to cultural education programs related to the interpretive component of the trail, the Hilo Bayfront Trails project could implement transportation-related educational programs for drivers as well as pedestrians and bicyclists. These programs could promote a share-the-road perspective that welcomes increased use of alternative transportation in the bayfront. *Bike Plan Hawai'i 2003* recommends the following types of educational programming for bicycling:

- Supporting bicycle education programs for all ages.
- Increasing awareness of the needs and rights of bicyclists into driver education programs.
- Increasing awareness about the health and fitness benefits of bicycling.

Other trails-related educational programming could be geared toward health and recreation topics; community fitness activities utilizing trail alignments and parks in the bayfront could be an integral part of community outreach via the Hilo Bayfront Trails project.

Continuing Community Involvement

A key suggestion of the community involvement in the Master Plan was the role that volunteers organized as the "Friends of Hilo Bayfront Trails" could play in the project. One inspiration for such a trails organization is the Kaua'i Path, or Ke Ala Hele Makalae, which is a 17-mile multi-use path stretching from Lihue to Anahola on Kaua'i. The project is strongly supported by community members who do auxiliary work during construction and maintenance after construction as Friends of the Path and Path Ambassadors. There are also opportunities for the Hilo community to refine and develop designs for these trail components, such as organizing a public design competition for the trails logo and having local artists and artisans create designs. Community members would also provide a rich source of information about their bayfront, including several stories or interpretations of the same event or site, the diversity of which should be embodied in the final interpretive panels along the trails. The Hilo Bayfront Trails interpretive program should utilize as many local resources as possible, including respected kupuna and educational venues such as the Lyman Museum, the Pacific Tsunami Museum, and the University of Hawai'i at Hilo and Hawai'i Community College. Interpretive information may be collected through research, by recording oral histories at neighborhood workshops, or even via an internet website that enables community members to input stories and upload photographs. The information collected for interpretive signage should be archived for the development of trails-related educational curricula and the training of Hilo residents as trails docents.

PART 2: ALTERNATIVES

2.1 No Action

Under the No Action Alternative, the improvements would not be undertaken. The area between Hilo Harbor and Downtown Hilo would continue to lack a cohesive and aesthetic system of trails and pathways to provide potential users – which include both residents and visitors – a safe and efficient means of travel. Tourists disembarking from cruise ships who would like to walk to or from the downtown area would continue to walk along the busy Kalaniana‘ole Street without a sidewalk. Furthermore, residents and visitors would not benefit from the proposed loops into downtown and the Wailoa Park area, new parking areas and interpretive signage.

2.2 Alternatives Evaluated and Dismissed from Further Consideration

During the extensive process of consultation for the project, numerous ideas were presented for incorporation into the plan, ranging from ferries across the Wailoa River to extending the trail to Richardson’s Ocean Park in Hilo. The reader is referred to the Master Plan for fuller discussion. In terms of alternatives that were advanced by the stakeholders for final serious consideration, as discussed in Section 1.2, the original Master Plan alternative included several project elements that are no longer under consideration. The most notable were proposals for segments of the trail along the partly submerged old railroad right-of-way near Reed’s Bay and a crossing of Mohouli Pond, both of which would have involved bridges in tidal waters and wetlands. These sub-alternatives were carefully examined and dismissed from consideration early in the EA process in favor of less expensive and environmentally adverse routes.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The area between Downtown Hilo and Hilo Harbor is referred to throughout this EA as the *project site*. Depending on the resource under discussion, the term *project area* is more flexible and is used to describe the general environs, sometimes denoting all of Hilo.

The project site is located along the coast of Hilo between the Wailuku River and Hilo Harbor at Kūhio Street (see Figures 1-3), extending as much as about a half mile inland in Wailoa Park, the Waiolama soccer fields, and Downtown Hilo. The elevation throughout most of the project site varies from sea level to about 15 feet above sea level, although the portion within downtown extends *mauka* as high as 85 feet above sea level at the corner of Haili Street and Kapiʻolani Street. Throughout much of the project area the terrain has been extensively reshaped by over a century of construction and demolition; grading, fill and sand removal for highways, railroads, and recreational facilities; and the large tsunamis in 1946 and 1960. The original vegetation disappeared centuries ago and the landscape is now almost completely artificial, consisting of plantings around buildings, managed vegetation near roads, park landscaping, and isolated weed patches, with a semi-natural strand community along limited areas of the shoreline.

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

Geologically, the project site is located near the interface of Mauna Loa and Mauna Kea. Near Hilo Harbor, the surface is 750-1,500 year old Mauna Loa lavas. Along the shore of Hilo Bay the surface consists of beach sand from the Holocene epoch (up to 10,000 years old), underlain by lava flows from Mauna Loa and perhaps Mauna Kea. Near downtown, recent lava flows from Mauna Loa and older flows from Mauna Kea interfinger (Wolfe and Morris 1996). On Mauna Loa portions, the project area soil is classified by the U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) as Keaukaha extremely rocky muck (rKFD), a dark brown and strongly acid soil that is approximately 8 inches thick. Permeability is rapid, runoff moderate, and erosion hazard slight. On the portions of the project site adjacent to the shoreline, the natural material on the site consists of riverine and marine sand instead of the typical regional soil. A small area of Mauna Kea-derived Hilo silty clay loam is present above downtown. This soil has a dark-brown, highly acidic surface layer about 12 inches thick overlying a subsoil that may be as deep as 48 inches. Rock outcrops are also present. On areas of steeper slopes, the soil erosion hazard changes from slight to moderate. Permeability is rapid and runoff is medium (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area of Hilo is 3 on a scale of ascending risk 9 to 1 (Heliker 1990:23). The hazard risk is based on the fact that Mauna Loa is an active volcano. Volcanic hazard zone 3 areas have had 1 to 5 percent of their land area covered by lava or ash flows since the year 1800, but are at lower risk than zone 2 areas because of their greater distances from recently active vents and/or because the local topography makes it less likely that flows would cover these areas.

In terms of seismic risk, the entire Island of Hawaiʻi is rated Zone 4 Seismic Hazard (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built, as the 6.7-magnitude quake of October 16, 2006, demonstrated. The special risk of seismic-related tsunami is covered in Section 3.1.3, below. The project site is not subject to subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

In general, geologic conditions impose no constraints on the proposed action, and the proposed project is not imprudent to construct.

3.1.2 Water Features and Water Quality

Existing Environment

Water is a unifying element along the bayfront, and Hilo Bay is the water feature common to all parts of the project site, which basically follows the shoreline of Hilo Bay but extends as far as half a mile from the shoreline (see Figures 1-3). The western edge of the project area is defined by the Wailuku (“water of destruction”) River. The central portion of the project area includes a broad estuary called Waiākea Pond (part of which is also called Wailoa Pond), which has an inland extension named Mohouli Pond. The waters of the Alenaio Stream and the Waiolama Canal converge with the ephemeral Waiākea Stream at the Wailoa River. A key part of the project is a shared use path that would encircle Waiākea Pond, making use of several existing bridges and constructing one additional bridge (see Figure 3). At the eastern end of the project area are inlets of Hilo Bay that include Reed’s Bay, where sailboats anchor, and Kanakea Pond (also aptly called Ice Pond), which is a popular swimming area, with its cool, spring-fed water providing a relief from the mid-day heat.

Hawaiʻi Administrative Rules (HAR) 11-54-03(c)(2) state that class A waters such as those found in Hilo Bay are valuable for recreational purposes and aesthetic enjoyment. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters.

Hilo Bay, where groundwater, stream flow and other runoff ultimately collect, supports fishing, gathering, boating, swimming and other water activities. Pollution in Hilo Bay is an ongoing problem. The primary source of damaging pollution has historically been attributed to sewage and sediment pollution (Dudley et al 1991). The sewage problem results mainly from groundwater seepage from unsewered residences and businesses. The situation is undergoing gradual improvement through installation of sewage mains and mandatory property hook-ups in accordance with service expansion. This is being implemented as part of the Hilo Wastewater Treatment Facility master plan, which has provided sewer mains to existing neighborhoods such as Keaukaha Hawaiian Homes, Waiākea House Lots, Old Waiākea Mill, and Ainako, which long lacked sewer service. Sewer facilities for a number of other neighborhoods in Hilo are in progress or planning, although funding constraints have slowed expansion.

According to the U.S. Natural Resources Conservation Service, the vast majority of sediment pollution in Hilo Bay before 1990 was the result of sugar cane cultivation. Until 1992, about 12,000 acres of land in the Hilo area were planted to cane. Each winter, storms would pile up thousands of cubic yards of bagasse (cane debris) and sediment on the beach at Hilo Bay. Sugar cane cultivation ceased entirely in the early 1990s. Despite the substitution of other crops over some of the sugar land and a modest but continual expansion of construction in the Hilo area, all authorities agree that sediment pollution has substantially decreased since that time.

A recent assessment and watershed-based plan prepared for the Hilo Bay Watershed Advisory Group (Silvius et al 2005) listed the key threats to water quality, in no particular order, as urban flooding; urbanization in flood zones; conservation area flooding and erosion; lack of enforcement of regulations and need for more of appropriate grading regulations; lack of education on best management practices; the left-over impacts of sugar cane industry; the impacts of the Hilo Bay Breakwater on Hilo Bay circulation; an incomplete municipal wastewater system along with a high number of cesspools; and invasive plant and animal species. As the relative contributions of each of these factors are unknown, the solution may lie in a combination of structural and non-structural means, but most critical is the need for additional research.

The left-over impacts from the sugar industry include arsenic that was used in conjunction with other pesticides in the manufacture of Canec, an insect- and rat-resistant wallboard product made from bagasse, a sugar cane byproduct. The arsenic was included in wastewater discharged into Wailoa River's estuary pond by a manufacturing plant operating from 1932 to 1963 on the shore of Waiākea Pond. Although arsenic was also used as a pesticide on sugar plantations, that source is considered less of a concern than the Canec source, as analysis of sediments at the mouth of the Wailuku River, which drains former sugar plantations, show arsenic at background levels.

In the late 1970s, sediments in Hilo Harbor had the highest concentrations of arsenic of any estuary in the State. However, as arsenic is not very soluble, concentrations of arsenic in the bay's water are generally at non-detectable levels both currently and at the time of testing in the 1970s. Consumption of fish caught in areas where arsenic is present in sediments is not believed

to be a health concern, because while arsenic can accumulate in the viscera of fish, levels in the muscle tissue are low. Studies of arsenic movement in the Wailoa estuary suggest that it is not of significant environmental concern unless the sediments are disturbed. However, as reported in a *Hawai'i Tribune-Herald* article of January 31, 2007, by Bret Yager, researchers believe the arsenic-laden sediment may have been subsequently covered by new soil and testing of soil dredged from the mouth of the Wailoa River in 2007 showed no significant levels of arsenic.

Canoe paddlers and surfers in Hilo Bay commonly complain of water quality related problems, including turbidity (murkiness), skin irritations (possibly from the larvae of cnidarians, a group of marine animals that contain stinging structures known as nematocysts, and include jellyfish, corals, sea anemones and hydroids), and staphylococcus infections.

Although five new bridges were originally proposed as part of the Master Plan (one in association with the Reed's Bay Beach Park Improvements project), the project as currently proposed includes just one new bridge. This bridge would be for a shared use path over the Wailoa River near the main pavilion in Wailoa State Park (see Figure 3). The project also includes a lateral expansion of the existing bridge at Kumu Street. Current indications are that these bridges would not require work within waters of the U.S., including wetlands, and that no permits administered by the U.S. Army Corps of Engineers would be required. The Corps derives it regulatory authority over waters of the United States from the two federal laws that are central to the Corps' regulatory program. Section 10 of the Rivers and Harbors Act of 1899 applies to all navigable waters of the United States, and Section 404 of the Clean Water Act applies to all waters, including wetlands, that have sufficient nexus to interstate commerce. Waters of the U.S. include essentially all permanent surface waters such as all navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. The U.S Army Corps of Engineers Pacific Division, Regulatory Branch is being consulted as part of the EA process. As part of final design, when detailed bridge designs are available, the Corps will again be consulted to determine if permits are required.

Impacts and Mitigation Measure

As the project involves only minimal land use changes, little if any long-term effects to sedimentation are expected. Possible exceptions would be construction/enlargements of bridges and paved pathways, the extent of which still remains to be determined. No adverse wastewater impacts are expected because the site is serviced with municipal sewerage, and no new restrooms are planned. However, due to the project site's proximity to the ocean and waterways, sedimentation during construction may occur if not properly mitigated.

In order to minimize the potential for sedimentation and erosion of shoreline areas, contractors for various segments of the project will be required to apply for appropriate permits as the project is built out. For areas under an acre that are unrelated to other segments, the permit may be restricted to County grubbing and grading permits. For larger segments, a National Pollutant

Discharge Elimination System (NPDES) permit must be obtained by the contractor before the project commences. In any case, the contractors will be required to perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code. Some permits, including the NPDES, will require the completion of a Storm Water Pollution Prevention Plan (SWPPP). In order to properly manage storm water runoff, the SWPPP will describe the emplacement of a number of best management practices (BMPs) for the project. These BMPs may include, but will not be limited to, the following:

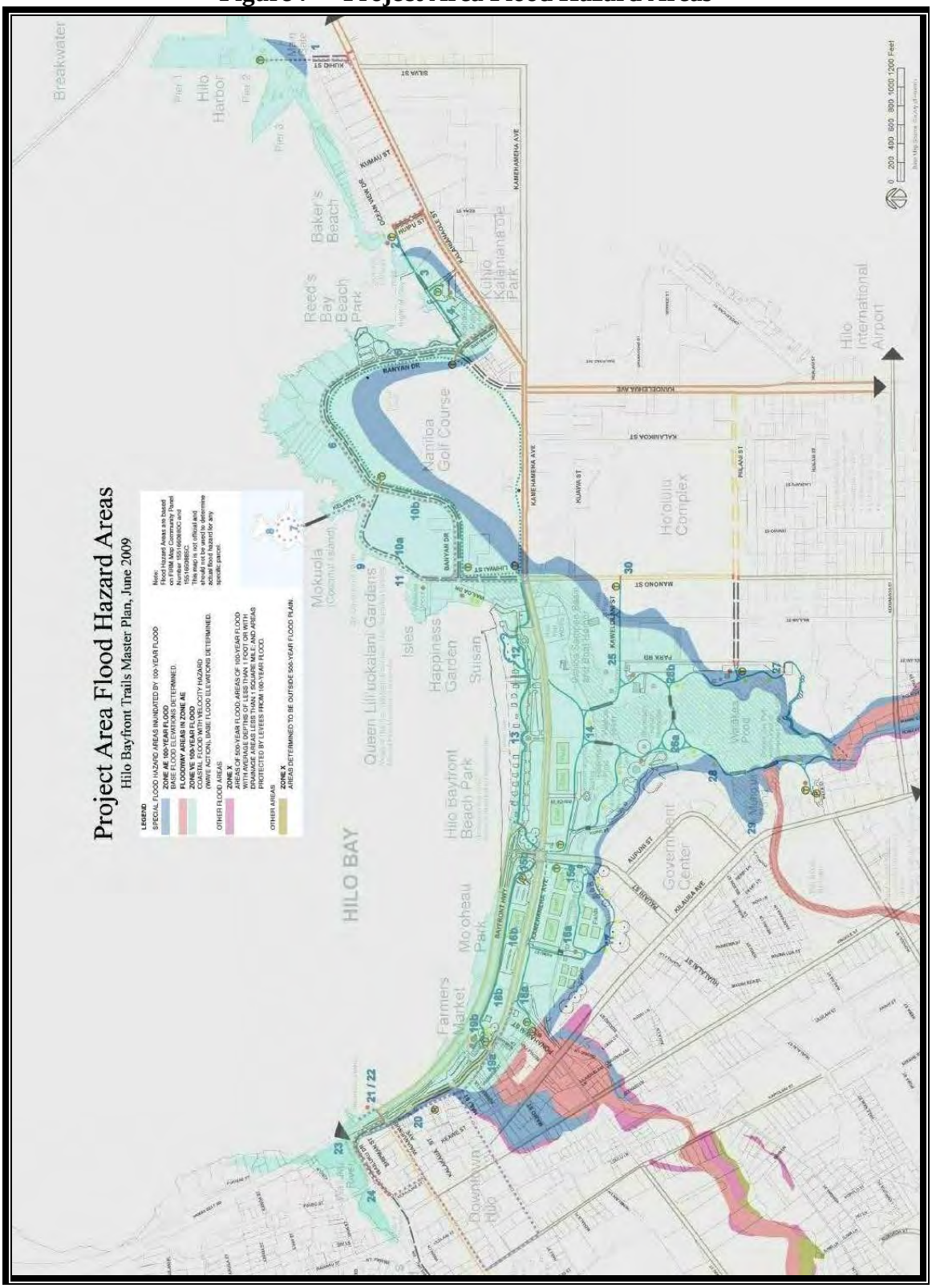
- Minimization of soil loss and erosion by revegetation and stabilization of slopes and disturbed areas of soil, possibly using hydromulch, geotextiles, or binding substances, as soon as possible after working;
- Minimization of sediment loss by emplacement of structural controls possibly including silt fences, gravel bags, sediment ponds, check dams, and other barriers in order to retard and prevent the loss of sediment from the site;
- Minimizing disturbance of soil during periods of heavy rain;
- Phasing of the project in order to disturb a minimum necessary area of soil at a particular time;
- Application of protective covers to soil and material stockpiles;
- Construction and use of a stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond;
- Washing of vehicles in the designated wash area before they egress the project site;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel; and
- Proper clean-up and disposal at an approved site of significant leaks or spills, if they occur.

3.1.3 Drainage and Flooding

Existing Environment

The project site is within an area of flood hazard from both streams and the sea. The Flood Insurance Rate Maps (FIRM) 880C and 885C (both 9/16/88) show much of the project site in Flood Zone VE, indicating the 100-year flood coastal, high hazard floodplain, incorporating storm surge inundation (Figure 7). The exceptions are portions mauka of the Waiākea Peninsula, specifically above the Naniloa Golf Course, and along Kalaniana‘ole Street between Reed’s Bay and Hilo Harbor. The 100-year floodplain designates areas in Flood Zone VE as subject to inundation from a flood having a one percent chance of occurring in any given year. This flood is referred to as the “100-year” flood or “base flood” and may occur more or less often than once every 100 years. The base flood elevation (BFE), mostly between 22 and 28 feet at the proposed site, is the estimated elevation of the 100-year flood based on the National Geodetic Vertical Datum of 1929 (NGVD). Maps printed by the Hawai‘i County Civil Defense Agency locate the parcel in the area that should be evacuated during a tsunami warning. Hilo Bay, including the

Figure 7 Project Area Flood Hazard Areas


Project Area Flood Hazard Areas
Hilo Bayfront Trails Master Plan, June 2009
LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE AE 100-YEAR FLOOD
BASE FLOOD ELEVATIONS DETERMINED.
FLOODWAY AREAS IN ZONE AE
ZONE VE (EL 9 FEET) 100-YEAR FLOOD
COASTAL FLOOD WITH VELOCITY HAZARD
(WAVE ACTION), BASE FLOOD ELEVATIONS DETERMINED.
OTHER FLOOD AREAS
ZONE X
AREAS OF 500-YEAR FLOOD AREAS OF 100-YEAR FLOOD
WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH
DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS
PROTECTED BY LEVEES FROM 100-YEAR FLOOD.
OTHER AREAS
ZONE X
AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOOD PLAIN.
Note:
Flood Hazard Areas are based on the Hawaii County Panel Number 155160B0C and 155160B0C.
This map is not official and is for illustrative purposes only. Determine actual flood hazard for any specific parcel.
0 200 400 600 800 1000 1200 Feet
Breakwater
Hilo Harbor
Pier 1
Pier 2
Pier 3
Baker's Beach
Reed's Bay Beach Park
Kuhio Kalanianaole Park
Hilo International Airport
Nanipa Golf Course
Hoolulu Complex
Mokuola (Coconut Island)
Queen Liliuokalani Gardens
Isles
Happiness Garden
Suisan
Hilo Bayfront Beach Park
HILO BAY
Mooheau Park
Farmers Market
Downtown Hilo
Government Center
Waiakea Pond
Waiakea Peninsula
Wailoa River
KIMO DR
KUMAU ST
BANYAN DR
KAMEHAMEHA AVE
KALANIKOA ST
KUAWA ST
MANONO ST
KAWELO ST
PIILANI ST
AUPUNI ST
POLAIKA AVE
BAYFRONT HWY
KEKUA ST
KALAKAUA ST
KILAUEA AVE
PIOPIO ST
LIHIWAI ST
KEALIKI ST
PUAINAKO ST
KAPIOLANI ST
PUNAHOU ST
KINOOLE ST
PAUAHI ST
KAMEHAMEHA ST
KAPUEPUE ST
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project site, has been struck by several highly destructive tsunami in historic times. The April 1, 1946 tsunami had a runup at Hilo Bay of 25 feet and killed 122 people on the Island of Hawai‘i. The May 23, 1960 tsunami had a runup of 35 feet at Hilo Bay, killing 61 people and destroying about 540 homes and businesses in Hilo alone (Hawai‘i County 2003).

In addition to the tsunami flood hazard, the project site may experience stream flooding from the Alenaio and Waiākea Streams. During exceptionally heavy rains that occur on the average every 5 to 10 years, Hilo is inundated between Ponahawai Street and the Wailoa River. As this area has been dedicated to open space and recreation, the damage is usually not of great magnitude, but roads are closed and recreational activities disrupted.

Several small drainage canals and pipes drain the downtown area, Waiolama and Wailoa Parks, and Kamehameha Avenue, emptying into the sea or Waiākea Pond. The ditches and pipes channel storm flow from these areas into the ocean and must be maintained.

Impacts and Mitigation Measures

Although conceived and designed to minimize construction to the extent still consistent with accomplishing key recreation and transportation goals, the project must site various components, including shared use paths, bicycle lanes, parking areas, and signage, within Zone VE. Although possibly only certain types of signage would be considered regulated structures under the National Flood Insurance Program, all will require review and approval by the County of Hawai‘i. As much of the project site is located in Zone VE, construction of these facilities in a flood zone is unavoidable. Siting these facilities in the 100-year floodplain would likely have no impact on the BFE or the size of the floodplain.

The National Weather Service of the National Oceanic and Atmospheric Administration operates the Pacific Tsunami Warning Center and Alaska Tsunami Warning Center, which monitors sudden earth movements throughout the Pacific Basin. Tsunamis generated from earth movements on the Pacific Rim, including South America, Japan, California and Alaska, would allow for warning times between 4 and 15 hours, sufficient time for evacuation of the Hilo Bayfront. Sudden movement along faults close to Hawai‘i are unpredictable, allowing only minutes or perhaps an hour of warning time, and evacuation would be more problematic. Coastal recreational areas in Hilo cannot avoid the tsunami hazard because the entire coast is vulnerable to tsunami. Warning sirens are present near most areas of the project site and are easily audible in all locations.

3.1.4 Flora and Fauna

Existing Environment: Flora and Vegetation

The natural vegetation of this part of this part of the Hilo shoreline was mostly strand and wetlands vegetation dominated by grasses such as *aki aki* (*Sporobolus virginicus*), sedges and coastal herbs, vines such as *pohuehue* (*Ipomoea pes-caprae*) and *nanea*, (*Vigna marina*), as well

as shrubs and trees such as *hala* (*Pandanus tectorius*), *milo* (*Thespesia populnea*), *hau* (*Hibiscus tiliaceus*) and *naupaka* (*Scaevola taccada*) (Gagne and Cuddihy 1990). As discussed previously, this original community has been modified by centuries of human use involving draining of wetlands, fill for railroad beds, highways and urban uses, and landscaping for recreational use. The current vegetation of the project site is mainly managed vegetation, i.e., lawns and planted shrubs and trees. The above-named species still persist, however, and are even abundant in some areas. Other native plants are used as formal or informal landscape elements.

A botanical survey of the project site was performed by Pat Hart, Ph.D, and Ron Terry, Ph.D, in August 2009. Appendix 3 provides is a list of many of the plant species detected, with notes by area found. No listed or proposed threatened or endangered plant species were found or would be expected to be found on the project site, which is highly urbanized.

The vegetation of the Hilo Bayfront comprises mostly introduced species, and large grassy areas predominate. Clusters of ironwood trees are common at many parks, including Hilo Bayfront Beach Park, Reed's Bay Beach Park, and Kūhiō Kalaniana‘ole Park. Groves of coconut trees were planted many years ago between Bayfront Highway and Kamehameha Avenue and along Waiolama Canal. More recently, rainbow shower street trees were installed along Kamehameha Avenue in the bayfront. Of note are the "exceptional trees" of Hilo (Table 3) and the banyan trees along Banyan Drive.

Table 3
Exceptional Trees in the Project Area

Tree Name: Common and Botanical	**Location**
Gold Tree (*Cybistrax donnell-smithii*)	Forestry Arboretum (TMK 2-2-7:01)
Surinam Cherry (*Eugenia uniflora*)	Hilo United Methodist Church (TMK 2-3-14:07)
False Kamani (*Terminalia catappa*)	Haili Church (TMK 2-3-12:09)
Coconut Palms (*Cocos nucifera*)	Waiolama Canal (TMK 2-2-4:02)
Monkeypod (*Samanea saman*)	Suisan Company, Lihiwai Street (TMK 2-1-03:27)
Bo or Peepul Tree (*Ficus religiosa*)	Old Riverside School (Waiānuenue Avenue (TMK 2-3-15:1)
Indian Banyan (*Ficus benghalensis*)	Kalākaua Park (2-3-05:01)
Loulu Palm (*Pritchardia becariana*)	Kalākaua Park (2-3-05:01)
Divi-Divi (*Caesalpinia coriaria*)	Kalākaua Park (2-3-05:01)
Grove of Monkeypod Trees (*Samanea saman*)	Kamehameha Avenue and Pauahi Street (TMK 2-2-04:35)
Grove of Monkeypod Trees (*Samanea saman*)	Kamehameha Avenue and Pauahi Street (TMK 2-2-04:56)

Exceptional Trees: Under a 1984 county ordinance (Ord. No. 84-22, sec. 1; Am. 1992, Ord. No. 92-12, sec. 1; Am. 2004, Ord. No. 04-69, sec. 10), several exceptional trees in the project area are protected from destruction (Table 3.2). By definition, exceptional tree means "a tree or grove of trees with historic or cultural value, or which by reason of its age, rarity, location, size, aesthetic quality, or endemic status has been designated by the council as worthy of preservation."

In 1933, several park commissioners decided to promote Hilo tourism by having celebrities and distinguished visitors plant banyan saplings on Waiākea Peninsula. Initially, eight trees were planted in October 1933. Forty trees were planted between 1934 and 1938, and five more trees were planted between 1941 and 1972. In 1991, a tree lost to a tsunami was replaced. Plaques are mounted in front of the trees with the names of the celebrities who planted the trees, including Cecile B. DeMille, George Herman "Babe" Ruth, President Franklin D. Roosevelt, Amelia Earhart, and Senator Richard M. Nixon.

Existing Environment: Fauna

As part of the biological survey, biologist Patrick J. Hart, Ph.D., observed the habitat and noted birds that were heard or seen (Table 4). Nearly all birds observed were non-native, and no native forest birds were present. Common shoreline birds, including the Pacific Golden-Plover (*Pluvialis fulva*), considered an indigenous visitor, the Wandering Tattler (*Heteroscelus incanus*), an endemic resident, and the Ruddy Turnstone (*Arenaria interpres*), an indigenous visitor, are often seen in the Hilo Bay area. Various species of ducks, geese and other migratory birds utilize the ponds behind the Hilo Bayfront, and the Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife, has protected several fingers of land adjacent to the shore with gates that keep out dogs to allow resting areas for these species. The endangered Hawaiian goose or Nēnē (*Branta sandvichensis)* was observed near Waiākea Pond. While the Nēnē was once widespread, its numbers dwindled and at one point in the 20th century there were only 30 breeding pairs in the Islands. The population on the island of Hawai‘i is presently estimated at several hundred, and one of the flocks is located in Hilo.

Various other birds may overfly, nest, or utilize resources of the property, including the endangered Hawaiian Hawk (*Buteo solitarius*), the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffinus auricularis newelli*). These species are found throughout the urban areas of Hilo. Furthermore, Hawai‘i's only land mammal, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), is frequently observed on the Hilo Bayfront, as it is present in low numbers throughout East Hawai‘i. Hawaiian Hawks nest between March and September, and Hawaiian hoary bats are vulnerable to vegetation disturbance during a portion of their roosting period from June through August. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting and may collide with manmade structures; if not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals.

Existing Environment: Aquatic Biota

Hilo Bay is classified by the Department of Health as an impaired water body in need of water quality improvement. No aquatic biology surveys were undertaken for this project, but Hilo Bay is known to support a variety of marine flora and fauna. The oceanic waters of Hawai‘i support several endangered and threatened mammal and reptile species. Several of these, including the green sea turtle (*Chelonia mydas)*, the hawksbill sea turtle (*Eretomochelys imbricata),* and the Hawaiian monk seal (*Monachus schauinslandi)* have been recorded within Hilo Bay.

Table 4
Bird Species Observed in Project Area

Scientific Name	**Common Name**	**Status**
Acridotheres tristis	Common Myna	Alien Resident
Arenaria interpres	Ruddy turnstone	Indigenous Visitor
*Branta sandvicensis**	Nēnē	Endemic Resident
Bubulcus ibis	Cattle Egret	Alien Resident
Cardinalis cardinalis	Northern Cardinal	Alien Resident
Carpodacus mexicanus	House Finch	Alien Resident
Geopelia striata	Zebra Dove	Alien Resident
Heteroscelus incanus	‘Ulili	Indigenous Visitor
Lonchura punctulata	Nutmeg Mannikin	Alien Resident
Nycticorax nycticorax hoactli	Black-Crowned Night-Heron	Indigenous Resident
Paroaria capitata	Yellow-Billed Cardinal	Alien Resident
Passer domesticus	House Sparrow	Alien Resident
Pluvialis fulva	Pacific Golden-Plover	Indigenous Visitor
Sicalis flaveola	Saffron Finch	Alien Resident
Streptopelia chinensis	Spotted Dove	Alien Resident
Zosterops japonicus	Japanese White-Eye	Alien Resident

* indicates Federally listed endangered species
Note: various varieties of domestic ducks were also seen in Waiākea Pond.

Impacts and Mitigation Measures

No rare, threatened or endangered plant species are present within the project site or would be affected in any way by the project improvements. For the most part, the trail would involve only minimal disturbance of existing vegetation, and no removal of native vegetation or habitat. The project would require removal of weedy vegetation on the private property, TMK 2-2-053:020, on Maile Street (if this property is purchased or an easement acquired). As originally envisioned in the Master Plan, the project would have required clearing of non-native forest vegetation along the 25-foot wide by 800-foot long strip within the “paper road” Kawelolani Street (this EA has recommended that an alternate route along the cleared edge of Wailoa State Park be utilized). Both these areas are entirely devoid of native species or habitat for native animals. During construction and maintenance of the trail in other locations, various non-native trees may be trimmed or removed from the site as part of landscaping and development. Landscaping with native and Polynesian species would gradually be undertaken in association with the trail, improving habitat.

In order to avoid impacts to Hawaiian Hawks and Hawaiian hoary bats, the County will ensure that major vegetation clearing (currently only planned for the private property on Maile Street) is scheduled outside the March and September time period. The already observed presence of hawks and bats within this urbanized area indicates that the operational use of the trail by pedestrians and bicyclists is unlikely to have any effect on these endangered species. No lighting is planned for the trail, and thus no impacts to overflying seabirds is expected.

Nēnē browse on freshly mown grass and rapidly lose their natural fear of humans after constant exposure, encouraging them to frequent parks and golf courses. Feral mammalian predators such as rats and mongooses as well as free-roaming domestic and feral dogs and cats pose a significant threat to Nēnē and their nests, eggs and goslings. In the context of an urban park that already experiences heavy usage, the construction and use of pedestrian and bike trails is unlikely to have any adverse impact upon Nēnē. However, area residents and visitors need to be educated about all the native fauna that continue to inhabit the Hilo Bayfront, and signage regarding the endangered status of Nēnē and prohibitions on harassing and feeding are recommended.

No additional impact upon native terrestrial or aquatic fauna would occur. All construction would avoid impacts to aquatic habitat through Stormwater Pollution Prevention Plans discussed above in Section 3.1.2.

3.1.5 Climate, Air Quality, Noise, and Scenic Resources

Environmental Setting

The average maximum daily temperature at sea level in Hilo is 81.0 degrees F., with an average minimum of 66.7 degrees, and annual rainfall averages approximately 130 inches (U.H. Hilo-Geography 1998:57; http://cdo.ncdc.noaa.gov/climatenormals/clim81/HInorm.pdf).

Air pollution in East Hawai‘i is minimal, and is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that occasionally blankets the district. The persistent trade winds keep Hilo relatively free of vog for most of the year.

The project site contains portions of two major highways, State Highways 11 and 19. It is also under the dominant flight path of jets approaching Hilo International Airport, but outside the Airport Clear Zone. Hilo Harbor and Wailoa Small Boat Harbor are also located nearby. Consequently, from about 6 AM to 10 PM, a moderate level of noise is more or less constant, punctuated every half hour or so by brief bursts of intense jet noise. The existing recreational patterns in the vicinity of the project site – water activities, golf, picnicking, bicycling and walking – have developed within this acoustic context.

The project area offers a number of scenic views, including some considered significant for their natural beauty in the Hawai‘i County General Plan (Table 5).

Table 5
Areas of Natural Beauty Noted in Hawai‘i County General Plan

Scenic Resource	TMK	Location
Banyan Drive Scenic Area	2-1-01, 03, 05	Waiākea
Queen Lili‘uokalani Gardens	2-1-03:02	Waiākea
Viewpoint of Hilo Bay area with Mauna Kea in Background	2-1-03:02	Waiākea
Viewpoint of Hilo Bay with Mauna Kea in Background	2-1-03:17	Waiākea
Coconut Isle (Moku Ola)	2-1-03:19	Waiākea
Reed’s Bay (Shoreline)	2-1-05:01	Waiākea
Viewpoint on hilltop looking over Hilo Bay	2-3-37	Ponahawai

Impacts and Mitigation Measures

The proposed action would not measurably affect air quality or noise levels except minimally during construction, which would be conducted only during reasonable hours.

The design and landscape of the project have been conceived to enhance the scenic character and provide additional access to this historic and vibrant area. The Hilo Bayfront Trails would offer new view opportunities along much of the route, as would the various new parking areas. As a result, the important viewplanes or scenic sites recognized in the Hawai‘i County General Plan would be enhanced.

3.1.6 Hazardous Substances, Toxic Waste and Hazardous Conditions

Environmental Setting, Impacts and Mitigation Measures

As the proposed improvements traverse a large area with longstanding recreational, residential, industrial and commercial uses, and the proposed project does not involve substantial excavation or expanded land use, no systematic assessment of the site history was conducted to determine if hazardous materials, toxic waste or other hazardous conditions may have been present on the site. Reconnaissance of the site during topographic, botanical and design surveys did not reveal any evidence of such conditions along the trail alignments, nor have there been reports of such conditions. However, it should be noted that this EA did not include a systematic Phase I Environmental Site Assessment, which is recommended for any properties that might eventually be acquired by the County, in particular the current and former gas stations. Based on these factors, there does not appear at this time to be any outstanding concern related to these issues. If evidence of suspicious materials or conditions appears in any part of the trails during additional survey, design, or construction, it is recommended that the County undertake a systematic assessment of the particular property in question.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics and Recreation

The project would affect and benefit the district of South Hilo and to some extent the entire island of Hawai‘i. Table 6 provides information on the socioeconomic characteristics of Hilo along with those of Hawai‘i County as a whole for comparison, from the United States 2000 Census of Population.

Table 6
Selected Socioeconomic Characteristics

CHARACTERISTIC	ISLAND OF HAWAI‘I	HILO
Total Population	148,677	36,836
Percent Caucasian	31.5	15.8
Percent Asian	26.7	39.6
Percent Hawaiian	9.7	13.3
Percent Two or More Races	28.4	26.5
Median Age (Years)	38.6	38.0
Percent Under 18 Years	26.1	25.8
Percent Over 65 Years	13.5	15.8
Percent Households with Children	21.3	37.8
Average Household Size	2.75	2.85
Percent Housing Vacant	15.5	9.6

Source: U.S. Bureau of the Census. May 2001. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai‘i.* (U.S. Census Bureau Web Page).

The project takes place in the context of a number of parks and recreational areas:

- Kūhio-Kalaniana‘ole County Park
- Reed’s Bay County Beach Park
- Coconut Island County Park
- Queen Lili‘uokalani Gardens (County)
- County recreational areas known as “Isles” and “Happiness Gardens”
- Hilo Bayfront Beach Park
- Playing fields between Kamehameha Avenue and Bayfront Highway and Mo’oheau Park
- Wailoa State Park
- County playing fields around the Waiolama Canal

These areas and other important recreational sites discussed below are illustrated on Figure 3.

The open spaces and natural resources of the project area provide the backdrop for numerous organized and informal outdoor activities throughout the year. Responses to the project user survey conducted as part of the Master Plan indicate that outdoor activities in parks – including walking, strolling, bicycling, and picnicking – are the most frequently occurring activities in the project site. Currently, many persons walk for enjoyment and/or exercise around Queen Lili‘uokalani Park and, to a lesser extent, in Wailoa Park, and the project would expand those opportunities to bicyclists through construction of a parallel multi-use pathway.

Outrigger canoe paddling and racing are the most frequently occurring water activities in the project area. Canoe paddling has a deep cultural dimension as well, with important historical connections to Kamehameha and a long and prominent presence in Hilo Bay. The bayfront is home to several clubs in the Moku O Hawai‘i Outrigger Canoe Racing Association of the Big Island, including Kailana, Kamehameha, Keaukaha, and Puna. During the paddling season, these clubs practice and host regattas in Hilo Bay.

Paddlesports and surfing are also popular in Hilo Bay. The Hawai‘i Island Paddlesports Association (HIPA) has more than 200 solo and duo paddlesports members who participate in paddling events throughout the season in Hilo Bay. Many individual kayakers use the bay, and commercial kayak tours occur whenever cruise ships are in town. In the project area, the surf break of Kaipalaoa Landing commonly called Bayfronts is heavily used on the 10 to 30 mostly winter days per year that waves are present.

Boating facilities are available at the Wailoa Sampan Basin and Boat Harbor, which is under the jurisdiction of the Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DLNR DOBOR). Located on the Wailoa River are 50 moorings, two boat ramps, vessel washdown facilities, trailer and car parking, and a restroom. DLNR DOBOR also oversees 25 moorings for boats at Reed’s Bay.

Na Hoa Holomoku of Hawai‘i Yacht Club promotes all forms of boating in East Hawai‘i and is working toward setting up a permanent base for sailing activities in Hilo. The club sponsors monthly sail days commencing at Hilo Bayfront Beach Park. The University of Hawai‘i at Hilo Sailing Team started in 2001 and thrived for several years until the founder and the coach left Hawai‘i Island. In the fall of 2006, one of the former team members reinstated the program. Boating also occurs on the waters of the Wailoa River State Recreation Area. Motor boats are permitted from the boat harbor to the arched bridges on Waiākea Pond. Beyond the double arched bridges, only wooden, non-fossil fueled fishing boats are allowed. Since August 1990, Hui Okinawa has sponsored the annual Haari Boat Festival at the Wailoa River in the Wailoa River State Recreation Area. Local school children are taught how to sail a double-hulled Hawaiian canoe on the Wailoa River, and the canoe escorts visiting tribes up the Wailoa River during the annual Hilo Inter- Tribal PowWow. The river has also become a popular site for stand-up paddling.

Mullet fishermen are a common sight at Waiākea Pond. There are two regulated fishing areas in the bayfront; both are under the jurisdiction of the Department of Land and Natural Resources Division of Aquatic Resources. The Waiākea Public Fishing Area is in Wailoa River State Recreation Area, and the Hilo Harbor Fishery Management Area (FMA) comprises Hilo Bay, the Wailoa River, and the Wailuku River.

Soccer is the most prominent land-based sports in the bayfront area. Fields located near Waiolama Canal and at the Wailoa River State Recreational Area and Moʻoheau Park are well-utilized by AYSO and HYSA (Haʻaheo) soccer clubs for season play as well as for tournaments. In 1994, the Hawaiʻi Castaways Disc Club founded the Wailoa State Championship Course for disc golfing at Wailoa River State Recreational Area. Their course is located in and around Wailoa Center on both sides of the Wailoa River.

The largest running event in the project area is the Big Island International Marathon; the 12th annual event occurred in March 2009. The marathoners race on many roadways in the project area, including Bayfront Highway, Kamehameha Avenue, Banyan Drive and Banyan Way, Kanoelehua Avenue, roadways adjacent to the Hilo International Airport, Silva Street, and Kalanianaʻole Street. The finish line is at Hilo Bayfront Beach Park. The Big Island Road Runners Club (BIRRC) sponsors "fun runs" in the project area, and many fundraising walks, such as the American Cancer Society Relay for Life, take place along the bayfront.

Bicycling is also a popular activity, both for individual cyclists and members of bicycle clubs and related organizations such as the People's Advocacy for Trails Hawaiʻi (PATH), the Hawaiʻi Cycling Club, and Hawaiʻi Island Bicycle System Advocates. Recreational cycling also occurs along the roads fronting the various parks and through the trails within parks themselves.

The Naniloa Golf Course on Banyan Drive is a prominent green space on the Waiākea peninsula, and the Hoʻolulu Complex and the Hilo Armory host numerous other sports and recreational activities in the bayfront.

In addition to sports-oriented recreation, the Hilo Bayfront is the site of many public and cultural events. Popular venues are the Moʻoheau Bandstand and the Palace Theater. There are dozens of events throughout the year, some of them recurring on an annual basis. Perhaps the most well-known cultural event is the Merrie Monarch Festival, a world-renowned hula festival that occurs annually during the week following Easter at the Edith Kanakaʻole Multi-Purpose Tennis Stadium in the Hoʻolulu Complex, although associated activities occur throughout town, including the project area. Founded in 1963, the event involves *halau* from all over the world. The Merrie Monarch Royal Parade winds through Downtown Hilo on Saturday morning of the festival. The Hilo Orchid Society holds it annual show and sale at the Edith Kanakaʻole Multi-Purpose Tennis Stadium. The event celebrated its fifty-seventh anniversary in 2009. At Queen Liliʻuokalani Gardens, the annual (tenth annual in 2009) He Haliʻa Aloha O Liliʻuokalani Festival honors Hawaiʻi's last reigning monarch with music, hula, crafts, food, and fishing.

Hawai‘i’s World Heritage Festival is held annually (sixth annual in 2009) at Mo‘oheau Park and Bandstand. The annual Aloha Festivals Ho‘olaulea also occurs in the vicinity of Mo‘oheau Park and Bandstand. This year will mark the 16th year of the event. For Black & White Night, on the first Friday of November, residents and visitors dress in black and white clothing and enjoy music, dancing, food, and entertainment in Downtown Hilo. This event was founded in 1985 by a group of merchants to help revitalize Hilo’s historic downtown. The Chinese New Year Festival is an annual event (seventh annual in 2009) held at Kalākaua Park in Downtown Hilo featuring food booths, cooking demonstrations, music, and a keiki Chinese costume contest.

In addition to recreation, there are many colorful shops and markets within the Hilo Bayfront area that provide goods and services and stimulate the local economy. Located at the corner of Mamo Street and Kamehameha Avenue in Downtown Hilo, the Hilo Farmers Market features over a hundred local farmers and crafters who sell their produce, crafts, gift items, and tropical flowers every Wednesday and Saturday. The market first opened in 1988. Downtown Hilo and other locations on the bayfront have a variety of retail shops and other businesses.

A sector of Hilo’s economy that is steadily growing in importance is the visitor industry. Hilo was designated in the 1950s as the principal arrival point and destination for visitors, as evidenced by the Hilo International Airport and the complex of hotels on Banyan Drive in the project area. By the 1970s the focus had moved to West Hawai‘i. Many of Hilo’s hotels closed, and others endured with low occupancy rates. Today Hilo supports a few hundred hotel rooms and several dozen vacation rentals and bed and breakfasts, centered on ecotourism, cultural events, and the growing area of “edutourism.” Another key component is the cruise ship market. Cruise ship calls to Hilo peaked in 2007, when domestic and international cruise lines brought approximately 500,000 passengers to Hilo Harbor. However, beginning in early 2008, Norwegian Cruise Lines, which had been using three vessels each making several trips around the Hawaiian Islands each month, began reducing the number of ships used in its regular Hawai‘i tours. While the number of cruise ship passengers making call at Hilo recently has dropped significantly from past years, it is still substantial. There are signs that when overall State of Hawai‘i tourism numbers begin to rebound, presumably in 2010 or 2011, cruise ship passenger count should increase as well (Hawai‘i Department of Transportation, Harbors Division: http://hawaii.gov/dot/harbors/passenger-cruise-schedules/passenger-cruise-schedules/?searchterm=cruise%20ships).

Impacts

The Hilo Bayfront Trails project would have substantial and beneficial social and economic impacts. It would improve social conditions in East Hawai‘i through enhancement of a recreational transportation system serving thousands of residents and visitors. The multi-use paths and other components of the trail project would improve and make safer the variety of access opportunities between Hilo Harbor and Downtown Hilo. The project would provide alternate scenic routes and signage with information about the area. It would also provide a safer and more scenic path for cruise ship passengers and others wishing to walk from Hilo Harbor to

Downtown Hilo or locations in between. Basically, the new pathways and improved circulation for walkers, runners and bicyclists will enhance opportunities for both visitors and residents to travel and view the entire Hilo Bayfront area. The project would enhance enjoyment of existing State and County parks and is not expected to adversely affect parks. Close coordination will continue to be required between the County agencies implementing the project and the County Department of Parks and Recreation and the State Department of Land and Natural Resources, Division of State Parks.

3.2.2 Cultural Resources

Existing Resources

As discussed in Section 1.1.1, centuries of traditional Hawaiian history as well as the eras of New England missionaries, whaling, and sugar cane, are all manifest on the Hilo Bayfront, giving a Hilo unique historical character and cultural importance. Research for this EA included preparation of a detailed Cultural Impact Assessment (CIA) including ethnographical research and evaluation of cultural resources. The CIA is included as Appendix 4a. To avoid redundancy, this information is not repeated in this section. In summary, the area is highly culturally significant, and the principal cultural resources present include:

- Sites of importance in Hawaiian stories, songs, chants, and historical accounts from both pre-Western contact and later eras.
- Sites of importance to the cultural traditions and historic record for the New England missionary/whaling period, Japanese immigration and settlement, and other cultural traditions.
- Areas where traditional activities continue to be practiced, including fishing and shore gathering, sport (e.g., surfing and canoe racing), hula, and many other practices.

Preserving the cultural resources of the Hilo Bayfront has been an important goal for cultural and recreational projects in Hilo.

Impacts and Mitigation Measures

Implementation of the Hilo Bayfront Trails project would not adversely impact cultural practices, and, on the contrary, the project has been designed with community input to enhance cultural resources and practices. Better and safer pedestrian and bicycle facilities will enhance access and promote enjoyment of the area's resources. Signage explaining the significance of Hawaiian land divisions, historic events and current practices will increase resident and visitor understanding and appreciation of the host culture. As part of the current study an effort was made to obtain information about any potential traditional cultural properties and associated practices that might be present, or have taken place in this portion of Waiākea *ahupuaʻa*. In

particular, the Office of Hawaiian Affairs (East Hawai‘i) and the Keaukaha Community Association have participated in project development, and Hawaiian organizations are expected to take an active role in designing and implementing the project. Various organizations have been supplied a copy of the EA in order to help finalize the finding that the project would not adversely affect cultural sites or practices.

3.2.3 Archaeological Resources

As part of the research for this EA, a detailed Archaeological Assessment Report was prepared. This report is summarized below and is included as Appendix 4b.

Prior Studies

A number of archaeological studies, discussed in detail in Appendix 4b, have been conducted in the project area. These include a comprehensive 1990 statewide study of Hawaiian fishponds that identified ten extant or former fishponds in the project area. There were fishponds in the Waiolama area of Kūkūau Ahupua‘a, in the Wailoa River area of Waiākea, at Queen Lili‘uokalani Gardens, and Reed’s Bay. In 1982 the Bishop Museum conducted a study (Kelly and Athens 1982) for improvements to the Alenaio Stream channel that were proposed by the U.S. Army Corps of Engineers. Although they found no sites in the former Waiolama Marsh area, they concluded that there was the potential for the discovery of subsurface “historic or prehistoric Hawaiian agricultural remains.”

As part of a larger study to identify suitable locations for the construction of the Hilo Judiciary Complex, M. Rosendahl (1988) investigated two locations within the current Wailoa State Park area and found no intact cultural resources. At the mouth of the Wailoa Stream near Suisan Fish Market, a single set of human skeletal remains were discovered, excavated, and studied (Pietrusewsky 1989; Smith and Tourtellotte 1988). This discovery indicates that additional remains may be present, especially in coastal areas of former dune deposits along the Hilo Bayfront. As T. Wolforth noted, “sand dunes are a preferred burial location, and it should be expected that prehistoric burials once existed within some portion of the sandy shoreline of Hilo Bay” (2007:29).

T. Wolforth conducted archaeological studies for the new Kūhiō-Kalaniana‘ole Park (2004) and for modifications to Reed‘s Bay Beach Park (2006), which together identified eight sites, some previously identified, including several Historic-era sites. Records on file at the State Historic Preservation Division reveal that five sites, all dating from the Historic Period, have been previously recorded in the vicinity of the Hilo Bayfront Trail project area. All were recorded by John Wright as part of the Statewide Inventory conducted in 1974. SIHP Site 7452 is the “Tsunami Clock” located on Kamehameha Ave; Site 7461 is a warehouse and landing at the back of Waiākea Pond, which are remnant structure from the Waiākea Mill; Site 7484 is the bridge constructed over Wailoa River on top of which Kamehameha Avenue was built; Site 7485 is the designation for the Suisan Fish Market; and Site 7486 is Queen Lili‘uokalani Gardens located on the Waiākea Peninsula.

Fieldwork and Archaeological Findings

The project site lies within what McEldowney (1979) has termed the Coastal Settlement Zone. This area extends from the shore to about one-half mile inland, and was a center of Hawaiian habitation with "a nearly continuous complex of native huts and garden plots interspersed with shady groves of trees" (McEldowney 1979:16). Burial and ceremonial sites are also known to have once been present near the shoreline. Hilo continued to be the focus of East Hawaiʻi habitation through the Historic Period and into modern times. Based on previous findings and the amount of development and disturbance in the project area, the archaeologists expected only a limited extent of undiscovered pre-Western contact archaeological resources, even if many Historic Period resources have survived and are visible across the general project area. Tsunami devastated not only the population but also the landscape, scouring much of Hilo's low-lying coastal area. Furthermore, most of the project site traverses existing roadways and sidewalks, and thus the expectations for identifying archaeological resources in these areas are very low. The central portion of the current project area includes open park lands and several currently undeveloped parcels. However, expectations for these areas are also low, because although currently undeveloped, they were formerly the sites of residential, commercial, or industrial land uses.

Between August and October 2009, a team of archaeologists including Robert B. Rechtman, Ph.D., Matthew R. Clark, B.A., and/or Johnny R. Dudoit, B.A. walked all of the proposed alignments for the Hilo Bayfront Trails project. The area from the Harbor entrance along Kalaniana‘ole Street to Banyan Drive and around the Waiākea Peninsula to the Wailoa River already has roadways and sidewalks that would be modified or improved to support their use as part of the proposed trail system. From the Wailoa Bridge around the Waiākea Fishpond complex (including Hoakimau, Moho‘uli, Waiākea, Waihole, Kalepolepo, and Waiohinu ponds) and along the Hilo Bayfront through the Waiolama area to Kaipalaoa Point, the proposed trail alignments extend across formerly developed areas that are now either park land, or, as in two locations to the east and south of Waiākea Pond, heavily vegetated vacant land. The Downtown Hilo portions of the proposed trail incorporate existing roadways and sidewalks that will be only surface-modified to identify the trail alignment.

The proposed trail alignments pass by or through many historic places and sites (e.g., Kanakea Fishpond, Banyan Drive, Queen Lili‘uokalani Gardens, Moku Ola, Suisan Fish Market, Wailoa Bridge, Waiākea Fishpond Complex, Waiākea Mill Site, Waiolama Marsh area, Kaipalaoa Point, and Downtown Hilo). The Hilo Bayfront Trails system is planned to take advantage of interpretation opportunities for these existing recognized places. However, the walking site survey conducted for this study observed no other specific archaeological surface features within any of the proposed alignments, likely because of the cycles of development and tsunami devastation that have affected the area throughout the 19th and 20th centuries.

While subsurface archaeological deposits may be present in some locations, they are likely to be highly disturbed. As Wolforth concluded, the problem is that the subsurface archaeological

remains are not likely to be intact. In other words, they are not likely to exist as layer upon layer of distinct 'horizons' of occupation and use. Rather, the continuous developments in this location over the years have taken place on the same ground surface. The royal families lived and played on the same surface that the Shinmachi residents and businesses built on, that the railroad built on, that the 1946 tsunami scoured clean, that various industries and warehouses subsequently built on, that the 1960 tsunami scoured clean, and that the current roads were built on (Wolforth 2007:30).

Impacts and Mitigation Measures

While no specific archaeological features were identified that would be impacted by the project, there is a small potential for yet undiscovered buried features (in either a disturbed or pristine context) to be encountered during subsurface development activities. The archaeologists recommended that an archaeological monitor be present during of all potential ground-disturbing activities associated with currently undeveloped segments of the proposed trail alignments, particularly in the vicinity of the Suisan Fish Market and within the Wailoa State Park, Waiolama Fields, and Hilo Bayfront Beach Park areas. Accordingly, the County will ensure that construction contracts require archaeological monitoring plans be prepared and submitted to and approved by the State Historic Preservation Division (SHPD) prior to the commencement of any such activities.

Furthermore, if archaeological resources, cultural items or human remains are encountered during any trail development activities, work in the immediate area of the discovery will be halted and SHPD will be contacted as outlined in Hawai'i Administrative Rules 13§13-275-12.

3.3 Infrastructure

3.3.1 Utilities

Existing Facilities and Services

Currently, no utilities appear to be required for implementation of the project, which would utilize existing restrooms and would not require electrical or telephone service. However, coordination with these utilities is important so that construction of the trail does not disrupt or interfere with utility service. Electrical power along the project site is supplied by Hawai'i Electric Light Company (HELCO), a privately owned utility company regulated by the State Public Utilities Commission, via its island-wide distribution network. Telephone service in Hilo is provided by Hawaiian Telcom (and, in Hawaiian Home Lands, Sandwich Isles Communications) via overhead and underground lines but is not required for the project. Water service is provided to Hilo by County of Hawai'i's Department of Water Supply (DWS). The Hawai'i County Department of Environmental Management operates a wastewater treatment plant in Hilo to which wastewater from project site restrooms is directed via underground lines for treatment.

Impacts and Mitigation Measures

Contractors for the project will be required to coordinate with utilities to avoid impacts.

3.3.2 Transportation Facilities

Existing Facilities

The Hilo Bayfront Trails utilize or cross a number of major and minor roadways (see Figure 3). These include:

- State Highway 19, beginning at Hilo Harbor and Kūhio Street and extending along Kalaniana‘ole Street, which becomes Kamehameha Avenue just prior to its intersection with Banyan Drive and State Route 11, from whence it continues along Kamehameha Avenue to Pauahi Street, and from there along Bayfront Highway to the Wailuku River, where it crosses the “singing bridge” and then continues toward the Hāmākua Coast. The highest volume of traffic in the project area is at the intersection of Kamehameha Avenue (State Route 19) and Kanoelehua Avenue (State Route 11), the bike lanes on which will be “adopted” by the project.

- The portion of Bayfront Highway that is currently gated and used as a parking lot for outrigger canoe and other water activities along Bayfront Beach. This segment is used as an emergency detour route.

- Kamehameha Avenue west of Pauahi Street to Wailuku Drive.

- Various County roads, including Banyan Drive, Banyan Way, Lihiwai Street, Manono Street, Pauahi Street, Keawe Street, Ponahawai Street, Haili Street, Waiānuenue Avenue, Wailuku Drive, Kinoole Street, and Kapi‘olani Street.

Matching bicycle lanes are located on Kanoelehua Avenue and matching bikeways are located on Kalaniana‘ole Street and a portion of Kamehameha Avenue. Bicycle parking is available at Mo‘oheau Bus Terminal and at various locations in Downtown Hilo. Pedestrian walkways are located on at least one side of almost every roadway in the project area and within parks and recreation areas. Some walkways are asphalt concrete; others are Portland cement concrete with curb and gutter. Walkway width varies from four feet to ten feet.

Many existing public parking areas are also present, most of them associated with the County and State Parks listed above in Section 3.2.1. Other transportation facilities within the project area include the Mo‘oheau Bus Terminal, which is the main hub of mass transit on the island of Hawai‘i. The County Mass Transit Agency provides public transportation from here to destinations throughout the island on the Hele-On bus. Stops in and near the project area include Banyan Drive, Aupuni Center, Hilo Shopping Center, Hawai‘i Community College, the

University of Hawai‘i at Hilo, and Prince Kūhiō Plaza; on “boat days,” Hele-On buses include service at Hilo Harbor. Hele-On buses are capable of transporting bicycles, either on board or in an underneath storage space. Adjacent to the bus terminal is a large parking lot for motorized vehicles and limited bicycle parking.

Impacts and Mitigation Measures

The project affects roads and parking areas through proposed improvement of signage and striping along roadways and at intersections, new crossing areas, and upgrades to existing parking areas. Access points to the trail’s components, including parking opportunities, and internal circulation for non-motorized travelers along the entire bayfront area would all be upgraded. These facilities are listed in Section 1.1, mapped in Figure 3, and discussed in detail in Appendix 2; to avoid redundancy, the discussion will not be repeated. However, the most notable proposed changes with the potential to affect circulation and safety is the conversion of the right-turn merge lane on Kamehameha Avenue west of Lihiwai Street (on the Wailoa River Bridge) to a shared use path.

It should be noted that the Master Plan also called for construction of a crosswalk on State Highway 19 at the Kaipalaoa Landing (Bayfronts surf spot) area. As discussed in Section 1.2, a separate project is now underway to create a park at Kaipalaoa, and as the crosswalk improvement is still under conceptual design and not yet identified as to location or design, it is not discussed further in this EA.

The State Department of Transportation Highways Division and Harbors Division expressed a number of concerns with the Master Plan in letters in response to early consultation (see Appendix 1a). The concerns are outlined below, along with the response of the Hawai‘i County Department of Research and Development:

- DOT stated that the safety and security protocols for Hilo Commercial Harbor would be jeopardized by the encroachment of the recreational pathway. Specifically, DOT recommended that Pier 1 Shed area not be a pathway destination, as shown in the current draft of the Hilo Bayfront Trails Master Plan, because locating the trailhead inside the harbor area would expose this industrial area to public access. DOT questioned giving access to the general public to the harbor, and recommended relocating the trailhead away from the Pier 1 Shed area to a site near the harbor entrance at Kūhio Street. *RESPONSE OF R&D*: The Pier 1 Shed area is not a Trails destination, but rather a facility specifically meant to serve cruise ship passengers and crew. One of the primary goals of this project, which was funded by the Hawai‘i Tourism Authority, was to improve the cruise ship passenger experience in port. R&D will continue to work with DOT Harbors to provide joint solutions that meet the safety and security needs, bearing in mind long-term plans for a relocation of the cruise ship terminal to an access served by Ocean View Drive, at which time the connection to Kalaniana‘ole Avenue can be via Huipū Street (currently a paper road only).

- Kumao Street is planned as a future entrance for cargo operations. Since large, commercial vehicles are less maneuverable than street vehicles, DOT is concerned that heavy commercial vehicle traffic threatens the safety of pathway users at this intersection. DOT recommended addressing the hazardous conditions at Kumao Street, perhaps through signalization. *RESPONSE*: Kalaniana‘ole Street right-of-way provides the only route to/from points beyond Hilo Harbor for pedestrians and bicyclists as well as motorized vehicles. Whether the Hilo Bayfront Trails project is developed or not, the route will continue to be used extensively by pedestrians and bicyclists. In accord with the County of Hawai‘i‘s General Plan, which promotes alternative modes of transportation (including walking and bicycling), and State DOT's *Bike Plan Hawai‘i 2003* (which designates the street as a signed, shared roadway) the design of the intersection of Kalaniana‘ole Street and Kumao Street should safely accommodate pedestrians and bicyclists. As DOT is the agency that will be developing harbor facilities that utilize Kumao Street as access, ensuring the safety of this intersection for pedestrians and bicyclists during DOT's improvements will be DOT's responsibility.

- The old Bayfront Highway along the Hilo Bayfront Beach Park is used as an emergency detour route when the intersection of Pauahi Street and Kamehameha Avenue is flooded and impassable. Locked gates near each end of the old Bayfront Highway prevent general use of this paved road, which is opened when Kamehameha Avenue is flooded. DOT asked that the EA specifically state the need to retain this roadway for such emergency purposes. *RESPONSE*: Essentially, the Hilo Bayfront Trails Master Plan will integrate with County P&R's Hilo Bayfront Beach Park Master Plan – with P&R taking the lead on this section. This plan calls for this segment of the old Bayfront Highway to be retained for emergency use, in accordance with DOT's requirements.

- DOT also recommended a quantitative comparison of the cost and benefits to providing new parallel facilities where separate pedestrians and bicyclists facilities already exist on both the mauka and makai sides of the Wailoa Bridge, and an analysis of the impact the proposed removal of the right-turn/merge lane from the Lihiwai Street/Kamehameha Avenue intersection. *RESPONSE*: R&D notes that Lihiwai Street does not have a dedicated right-turn lane; since southbound traffic usually blocks right-turning motor vehicles on red lights, there would appear to be no substantial need for a right-turn merge lane. The experience of both pedestrians and bicyclists who use this area, particularly the corner of Kamehameha Avenue and Lihiwai Street, is that right-turning vehicles frequently do not pay attention to bicyclists and pedestrians as they make their turns. R&D does not see any value in a quantitative economic comparison of the tradeoff between facility design that promotes bike/pedestrian safety versus one that slightly increases the efficiency with which motor vehicles move through an intersection. County engineers have examined the proposed improvement and believe it is reasonable. The County looks forward to working with DOT to analyze the proposed change in greater detail at the appropriate time.

- DOT stated that the proposed multi-use path improvements must comply with the Americans with Disabilities Act with respect to the existing crosswalk and sidewalk ramps at the intersection of Kamehameha Avenue and Lihiwai Street. *RESPONSE*: The County will ensure that all improvement on the project fully comply with the requirements of Hawai‘i Revised Statutes Section 103-50 and the Americans with Disabilities Act.

- DOT stated that improvements within the State highway right-of-way must be planned, designed and constructed to current State requirements. A permit is required for work within the State highway right-of-way and construction plans must be submitted to the Highways Division Hawai‘i District Office for review and approval. *RESPONSE*: R&D recognizes the need for these permits and approvals and looks forward to coordinating with the State through the County Department of Public Works.

In summary, R&D and its consulting engineers will undertake coordination with HDOT and DPW during the design phase of the project to ensure that all concerns are met.

3.4 Secondary and Cumulative Impacts

The Hilo Bayfront Trails project would not involve any secondary or cumulative impacts, such as population changes or effects on public facilities, except to the degree that it benefits circulation and connectivity in the network of public recreational areas in Hilo. Although the project would provide some short-term construction jobs, the labor demands are within the capacity of East Hawai‘i and all jobs could be filled by local residents. The project would not induce in-migration.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project – minor and temporary disturbance to air quality, noise, visual quality during construction – are very limited in severity, nature and geographic scale. Several recreational projects are planned for the coming years in the general area, notably the improvements to the Hilo Bayfront Beach Park and Reed’s Bay Beach Park. Expansion of Hilo Harbor, including a new pier for a cruise ship terminal, is also scheduled, although the timetable is uncertain. None of these improvements, nor any other minor roadway, utility, development, and recreational projects being undertaken in the Hilo Bayfront area, appear to have the potential to combine in such a way as to produce adverse cumulative effects or to involve commitments for larger actions.

3.5 Required Permits and Approvals

Various combinations of the following permits and approvals would potentially be required during individual actions that implemented the project (to be determined during final design):

1. County Department of Public Works (DPW):
    a. Building Division – Building Permit Application plan review and approval for compliance with all relevant codes (e.g., electrical, plumbing, seismic, etc).
    b. Engineering Division:
        i. County Traffic plan review and approval.
        ii. Grading Permit including review and approval of Drainage Plan.
        iii. Variance or exemption from HCC Chapter 27 – Flood Control to allow building within the VE Zone .
2. County Planning Department:
    a. Special Management Area (SMA) Use Permit – Major, including review and approval by Planning Commission and a Public Hearing.
    b. Variance to Shoreline Setback if structures are within 40' of the Certified Shoreline as approved by the State Surveyor, unless Planning Director determines that structures are "minor", as defined by Planning Department Rules Sec. 11-8.
    c. Plan Approval based upon:
        i. Landscaping plan review and approval.
        ii. Zoning, setback and land use compliance review and approval.
        iii. Adherence to conditions imposed by SMA Use Permit.
3. County Departments of Water Supply, Environmental Management and Fire:
    a. Plan review and approval for Building Permit.
4. State Department of Health (SDOH):
    a. Plan review and approval for Building Permit processing.
    b. Clean Water Branch - NPDES Permit Form C either "Individual" or "General" contingent upon site specific information to be determined during design.
    c. Safe Drinking Water Branch - UIC Permit would be required if injection wells are used for drainage.
    d. Disability and Communication Access Board (DCAB) plan review and approval.
5. State Department of Transportation – Highways Division, State highway review:
    a. Hydraulic review.
    b. Best Management Practices (BMP) review if there is a 1-acre increase in impervious surface.
    c. Rights-of-Way Branch review.
    d. Hawai'i Island District review.
6. State Department of Land and Natural Resources (DLNR):
    a. Certified Shoreline review and approval by the State Surveyor.
    b. State Historic Preservation Division NPDES Permit review and approval.
    c. Conservation District Use Permit or other approval.

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by improving vital recreation and transportation resources for the East Hawai‘i community, thereby enhancing quality-of-life and community and social well-being.

3.6.2 Hawai‘i County General Plan and Zoning

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Planning Department). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Goal and Policies, and Courses of Action:

RECREATION – GOALS

- Provide a wide variety of recreational opportunities for the residents and visitors of the County.
- Maintain the natural beauty of recreation areas.
- Provide a diversity of environments for active and passive pursuits.

RECREATION – POLICIES

- Recreational facilities shall reflect the natural, historic, and cultural character of the area.
- The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.
- Develop short and long range capital improvement programs and plans for recreational facilities that are consistent with the General Plan.
- The “County of Hawaii Recreation Plan” shall be updated to reflect newly identified recreational priorities.
- Facilities for compatible multiple uses shall be provided.
- Provide facilities and a broad recreational program for all age groups, with special considerations for the handicapped, the elderly, and young children.

- Adopt an on-going program of identification, designation, and acquisition of areas with existing or potential recreational resources, such as land with sandy beaches.

RECREATION – Courses of Action

- Expand the depth of coastal recreation areas. Park areas should be connected with trails to increase public access.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to recreational facilities in Hawai‘i County and the Hilo Bayfront area. This project’s purpose is to upgrade pedestrian and cycling routes, thereby improving and expanding recreational opportunities for residents and visitors alike, which integrates well with other the proposed improvements, including those at the Hilo Bayfront Beach Park and Reed’s Bay Beach Park.

TRANSPORTATION – GOALS

- Provide a transportation system whereby people and goods can move efficiently, safely, comfortably and economically.
- Make available a variety of modes of transportation that best meets the needs of the County.

TRANSPORTATION – POLICIES

- A framework of transportation facilities that will promote and influence desired land use shall be established by concerned agencies.
- The agencies concerned with transportation systems shall provide for present traffic and future demands, including the programmed development of mass transit programs for high growth areas by both the private and public sectors.
- The improvement of transportation service shall be encouraged.
- Consider the provision of adequate transportation systems to enhance the economic viability of a given area.
- Develop a comprehensive, islandwide multi-modal transportation plan that identifies the location and operation of automobile, mass transit, bicycle and pedestrian systems, in coordination with appropriate Federal and State agencies.

ROADWAYS – GOALS

- Provide a system of roadways for the safe, efficient and comfortable movement of people and goods.
- Provide an integrated State and County transportation system so that new major routes will complement and encourage proposed land policies.

ROADWAYS – POLICIES

- Encourage the programmed improvement of existing roadways by both public and private sectors.
- Investigate various methods of funding road improvements, including private sector participation, to meet the growing transportation needs of the island.
- Support the development of programs to identify and improve hazardous and substandard sections of roadway and drainage problems.
- Coordinate with appropriate Federal and State agencies for the funding of transportation projects for areas of anticipated growth.
- Develop short and long range capital improvement programs and plans for transportation that are consistent with the General Plan.

ROADWAYS – STANDARDS

- The County shall determine standards for the dedication and upgrade of existing roads.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to transportation facilities in Hawai‘i County and the Hilo Bayfront area. Among the project's purposes is enhancing pedestrian and cycling routes, preferably removed from the vehicular routes, which would provide safer transportation opportunities for both residents and visitors.

PUBLIC LANDS – GOALS

- Utilize publicly owned lands in the best public interest and to the maximum benefit.

HISTORIC SITES – GOALS

- Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.
- Appropriate access to significant historic sites, buildings, and objects of public interest should be made available.
- Enhance the understanding of man's place on the landscape by understanding the system of ahupuaa.

HISTORIC SITES – POLICIES

- Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.
- Collect and distribute historic sites information of public interest and keep an inventory of sites.

- Aid in the development of a program of public education concerning historic sites.
- Signs explaining historic sites, buildings and objects shall be in keeping with the character of the area or the cultural aspects of the feature.
- Develop a continuing program to evaluate the significance of historic sites.
- Recognize the importance of certain natural features in Hawaiian culture by incorporating the concept of "cultural landscapes" in land use planning.

HISTORIC SITES – STANDARDS

- The evaluation of the importance of specific historic sites is necessary for future action. The following standards establish a framework for evaluating sites.
- Importance in the life or activities of a major historic person.
- Associated with a major group or organization in the history of the island or community.
- Associated with a major historic event (cultural, economic, military, social, or political).
- Associated with a major recurring event in the history of the community (such as annual celebrations).
- Associated with a past or continuing institution that has contributed substantially to the life of the community.
- Unique example of a particular style or period.
- One of the few of its age remaining.
- Sites of traditional and cultural significance.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to historic sites in Hawai‘i County and the Hilo Bayfront area. This project's purpose includes placement of interpretive signage to provide information about significant cultural sites and history in the area.

Hawai‘i County Zoning and General Plan Land Use Pattern Allocation Guide (LUPAG). The project area lies within a number of County zoning districts in the general categories of Urban and Open. The zoning code allows pedestrian walkways or bike trails in any zoning category. The LUPAG map component of the *General Plan* is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. Most of the project site is classified as Open in the LUPAG, with some adjacent areas classified as High Density Urban. The proposed project is consistent with these designations.

Special Management Area. The project site is within the County's Special Management Area (SMA), and a Special Management Area Major Permit will be required for most elements of the project. Public parks, public uses, and structures are allowed in the Special Management Area,

with Plan Approval from the Planning Department required. The project would benefit and/or not adversely impact Special Management Area resources, including beaches, recreation, native species or ecosystems, historic sites, water quality, and susceptibility to hazards. Minor impacts and mitigation measures are discussed individually above. The project does not involve any irreversible or irretrievable commitment of resources or any substantial adverse environmental impact that cannot be avoided.

3.6.3 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The portions of the project site that would support improvements appear to be mostly located within the State Land Use Urban District. The proposed use is consistent with intended uses for this Land Use District.

Several elements of the project would involve actions within the Conservation District. The Conservation District is further subdivided into five subzones, and each subzone has a different set of uses permitted for that specific subzone. Within the Resource Subzone of the Conservation District in the project area, the following actions are proposed:

- Trail markings on existing pedestrian walkways and interpretive signage (2) on Moku Ola (Coconut Island).
- Trail markings and a two-way bike route on existing paving at Queen Lili‘uokalani Gardens.
- A new bridge and an expanded bridge, along with shared use path segments, over the Wailoa River.
- Boardwalk and viewing deck within the bounds of Kanakea Pond.

After design but prior to construction, the County will coordinate with the Department of Land and Natural Resources, Office of Coastal and Conservation Lands (OCCL), to determine whether each individual improvement is actually within the State Conservation District and what type of permit would be required. Some of the trail elements appear to be exempt activities, others are identified uses that require Site Plan Approval (e.g., certain signs and placards), and others are identified uses that would require Board or Departmental Permits. OCCL is being consulted as part of the EA in order to gain a preliminary assessment of permit requirements.

PART 4: DETERMINATION

Based on the findings listed below, the Hawai‘i County Department of Research and Development expects that the project would not have significant environmental impacts and anticipates making a Finding of No Significant Impact (FONSI). The agency will consider comments on the Draft EA when making its final determination.

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost. Improvement of Hilo’s recreational and transportation facilities and installation of interpretive signage would provide improved access to and understanding of existing natural and cultural resources. Archaeological monitoring will be conducted during ground-disturbing activities.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project expands and in no way curtails beneficial uses of the environment.
3. *The proposed project will not conflict with the State's long-term environmental policies.* The State’s long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project would complement natural resources and fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State’s long-term environmental policies.
4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project would benefit the social welfare of the community by enhancing important recreational and transportation facilities.
5. *The proposed project does not substantially affect public health in any detrimental way.* The proposed project would benefit public health by increasing access to healthful recreational activities.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. No secondary effects are expected to result from the proposed action, which would simply improve recreational opportunities along existing transportation facilities and would not induce in-migration or affect public facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality*. The project is minor and environmentally benign, and would thus not contribute to environmental degradation.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna would not occur.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The project is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.
10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts would preserve water quality. Ambient noise impacts due to construction would be temporary and restricted to reasonable daytime hours.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project is located in an area with tsunami, volcanic and seismic risk, all entire coastal areas on the Island of Hawai‘i share this risk, and the project is not imprudent to construct and employs design and construction standards appropriate to the flood and seismic zones.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas and viewplanes identified in the Hawai‘i County General Plan would be adversely affected by the project, which would provide enhanced access to and enjoyment of scenic sites.
13. *The project will not require substantial energy consumption*. Construction and maintenance of the improvements would require minimal consumption of energy. No adverse effects would be expected.

For the reasons above, the proposed action would not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statues and section 11-200-12 of the State Administrative Rules.

REFERENCES

Dudley, W and L.E. Hallacher. 1991. *Final Report: Distribution and Dispersion of Sewage Pollution in Hilo Bay and Contiguous Waters*. Hilo: University of Hawai‘i at Hilo.

Gagne, W., and L. Cuddihy. 1990. “Vegetation,” pp. 45-114 in W.L. Wagner, D.R. Herbst, and S.H. Sohmer, eds., *Manual of the Flowering Plants of Hawai‘i.* 2 vols. Honolulu: University of Hawai‘i Press.

Hawai‘i, County of. Annual Report Fiscal Year 2002-2003, pg. 7

Hawai‘i County Planning Department. 2005. *The General Plan, County of Hawai‘i*. Hilo.

Hawai‘i Department of Transportation, Harbors Division: http://hawaii.gov/dot/harbors/passenger-cruise-schedules/passenger-cruise-schedules/?searchterm=cruise%20ships

Heliker, C. 1990. *Volcanic and Seismic Hazards on the Island of Hawai‘i.* Washington: U.S. GPO.

Kamakau, S. 1961. *Ruling Chiefs of Hawai‘i*. Honolulu: The Kamehameha Schools Press.

Kelly, J. 2004. “All seas lead to Hilo: Outrigger canoe world sprints coming this summer.” *Hawaii Island Journal*.

Kelly, M., and J. S. Athens. 1982. *Archaeological and Historical Studies for the Alenaio Stream Flood Damage Reduction Study, Hilo, Hawaii*. Dept. of Anthrop., B.P. Bishop Museum. Prep. for U.S. Army Engineer Division, Pacific Ocean.

Kelly, M., B. Nakamura, and D. Barrère. 1981 *Hilo Bay: A Chronology History*. Dept. of Anthrop., B.P. Bishop Museum. Prep. for U.S. Army Corps of Engineers, Honolulu District.

Lang, L. 2007. *Exploring Historic Hilo*. Honolulu: Watermark Press.

McEldowney, H. 1979. *Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo Hawai‘i*. Manuscript on file, Department of Land and Natural Resources-State Historic Preservation Division.

Pietrusewsky, M. 1989. *Human remains Found at Wailoa Bridge Renovation Project*. Waiakea, South Hilo. Department of Anthropology, UH-Manoa.

Rosendahl, M. 1988. *Archaeological Reconnaissance Survey for Environmental Impact Statement, Hilo Judiciary Complex Sites*. PHRI Report 356-040888. Prepared for Wilson Okamoto and Associates, Inc., Honolulu.

Silvius, K., Moravcik, P., and M. James 2005. *Hilo Bay Watershed-Based Restoration Plan*. Subm. to Hawai‘i State Department of Health. Honolulu: University of Hawai‘i Environmental Center.

Smith, M., and P. Tourtellotte. 1988. *Wailoa Bridge Renovation Project, Site No. 50-10-11115 Burial Removal.* DLNR Historic Sites Section, Honolulu.

U.S. Dept. of Commerce, Bureau of the Census. 2001. http://factfinder.census.gov/.

U.S. Soil Conservation Service. 1973. *Soil Survey of Island of Hawai‘i, State of Hawai‘i.* Washington: U.S.D.A. Soil Conservation Service.

University of Hawai‘i at Hilo, Dept. of Geography. 1998. *Atlas of Hawai‘i.* 3rd ed. Honolulu: University of Hawai‘i Press.

U.S. Fish and Wildlife Service (USFWS). 2009. *USFWS Threatened and Endangered Species System (TESS).* Washington: GPO. http://ecos.fws.gov/tess public/StartTESS.do

Wolfe, E.W., and J. Morris. 1996. *Geologic Map of the Island of Hawai‘i.* USGS Misc. Investigations Series Map i-2524-A. Washington, D.C.: U.S. Geological Survey.

Yager, B. May 20, 2007. *Key questions about Hilo Bay’s health unanswered*. Hawai‘i Tribune-Herald.

Yager, B. January 23, 2009. *Tourism dollars sail past East Hawai‘i.* Hawai‘i Tribune-Herald.

Wolforth, T. 2004. *Inventory Survey for the Proposed Kūhio-Kalaniana‘ole Park, Hilo: Investigations into the Kanakea Fishpond at Reed’s Bay TMK: 3-2-1-6:13 and 15*. Scientific Consultant Services, Inc. Report B1. Prepared for The Rotary Club of East Hawai‘i.

_____. 2006. *Inventory Survey for the Proposed Reed’s Bay Beach Park, Hilo. Scientific Consultant Services, Inc.* Report. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

_____. 2007. *Draft Cultural Impact Assessment for Hilo Bayfront Master Plan, North Hilo District, Island of Hawai‘i.* Scientific Consultant Services, Inc. Report 771-1. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

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ENVIRONMENTAL ASSESSMENT

HILO BAYFRONT TRAILS

Hawai‘i County
Department of Research and Development

Appendix 1a
Comments in Response to Early Consultation

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----- Original Message -----
From: Chuck & Marilee
To: Ron Terry
Sent: Friday, June 05, 2009 12:48 PM
Subject: Re: Early Consultation for Hilo Bayfront Trail Project

Aloha Ron Thanks for sending that

I'm thinking Hilo rain has to be taken into consideration, was any thought given to the occasional shelter? Or interpretive signs ala` the King Kamehameha stature area?

Seems to me an explanation of the changes proposed in the plan are in order Ron. Most of the 'trails' are already in existence. As near as I can tell the Hilo Bayfront Trails Project is 90% about is putting up directional signs and a few benches. How is that going to ***attract*** anyone?

I love the idea of a short Riverwalk, I was witness to what it did to both San Antonio and Milwaukee 'before and after'. They had stunning success by any measurement. Riverfront shops, dining, hotels, strolling musicians, lighting etc.

Chas

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
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

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

June 16, 2009

Ron Terry, Ph.D.
Geometrician Associates, LLC
PO Box 396
Hilo, Hawaii 96721

LOG NO: 2009.1568
DOC NO: 0906MD17
Archaeology

Dear Dr. Terry:

SUBJECT: Chapter 6E-8 and 6E-42 Historic Preservation Review – Request for Comment on an Early Consultation for the Hilo Bayfront Trails Project Environmental Assessment Waiakea Ahupua`a, South Hilo District, Island of Hawaii TMK: (3) 2 (var.)

Thank you for the opportunity to comment on the aforementioned project, which we received on June 8,m 2009. This is a project by the County of Hawaii to develop a comprehensive system of connected trails and parks along Hilo Bay, which will also include interpretive stations, comfort stations, and trails through county, state and private property areas.

Because of the scope of this project and the numerous historic properties which will be viewed, included, or otherwise potentially affected by the system of trails we are requesting an archaeological inventory survey be conducted on the proposed trail route, including any alternative route(s) under consideration.

We look forward to reviewing the archaeological inventory survey and the upcoming environmental assessment. If you have any questions about this letter please contact Morgan Davis of our Hawaii Island Section at (808) 933-7650.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager
State Historic Preservation Division

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 30, 2009

Geometrician Associates, LLC
Box 396
Hilo, Hawaii 96721

Attention: Mr. Ron Terry, Ph.D.

Ladies and Gentlemen:

Subject: Early Consultation for Environmental Assessment for Hilo Bayfront Trails Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Division of Boating & Ocean Recreation, Engineering Division, Land Division-Hawaii District, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

for Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 8, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
__Div. of Forestry & Wildlife
x Div. of State Parks
__Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta Charlene
SUBJECT: Early Consultation for Hilo Bayfront Trails Project
LOCATION: Hilo, Hawaii
APPLICANT: Geometrician associates, LLC on behalf of the County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 29, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]
Date: 6/24/09

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 8, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
Div. of Forestry & Wildlife
x Div. of State Parks
Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early Consultation for Hilo Bayfront Trails Project
LOCATION: Hilo, Hawaii
APPLICANT: Geometrician associates, LLC on behalf of the County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 29, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

'09 JUN 12 AM 08:18 ENGINEERING

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: Eric T. Hirano
Date: 6/24/09

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LA/MorrisAtta
Ref.: EarlyConsultationHiloBayfrontTrails
Oahu.698

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that based on the maps provided it appears that the project sites, according to the Flood Insurance Rate Map (FIRM), are located in Flood Zones X, AE, and VE. The Flood Insurance Program does not have any regulations for developments within Flood Zone X however; it does regulate developments within Zones AE and VE as indicated in bold letters below.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

(X) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 6/24/09

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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2009 JUN 10 A 10: 07

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 8, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
__Div. of Forestry & Wildlife
x Div. of State Parks
__Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Hawaii District

FROM: for Morris M. Atta
SUBJECT: Early Consultation for Hilo Bayfront Trails Project
LOCATION: Hilo, Hawaii
APPLICANT: Geometrician associates, LLC on behalf of the County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 29, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:
Date: 6/9/09

William P. Kenoi
Mayor

Lono A. Tyson
Director

Ivan M. Torigoe
Deputy Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 · Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_envmng.htm

July 6, 2009

Mr. Ron Terry
Principal
GEOMETRICIAN ASSOCIATES, LLC
P. O. Box 396
Hilo, HI 96721

RE: Early Consultation for Hilo Bayfront Trails Project Environmental Assessment

Dear Mr. Terry,

We have no comments to offer on this Project.

Thank you for allowing us to review and comment on this project.

Sincerely,

Lono A. Tyson
DIRECTOR

11787 A

County of Hawai'i is an Equal Opportunity Provider and Employer.

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

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

IN REPLY REFER TO:

STP 8.3321

July 6, 2009

Mr. Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Subject: Hilo Bayfront Trails Project
Early Consultation (EC) for Draft Environmental Assessment (DEA)

Thank you for the early consultation of the State Department of Transportation's (DOT) as regards the Hilo Bayfront Trails Project.

DOT understands that the proposed project involves the design and construction of a comprehensive system of connected, multi-use trails, paths and parks for access and recreational purposes. The project is sited along the Hilo Bayfront area between the Wailuku River and the Hilo Commercial Harbor area. Given the potential impacts to State highway and harbor facilities, DOT requests to be consulted during the environmental review process. The following initial comments should be addressed in the DEA.

1. Any potential impacts to State highway or harbor facilities as a result of the trail and path system location or proposed use should be identified and discussed.

2. Hilo Commercial Harbor is a busy industrial facility. DOT is concerned that its safety and security protocols will be jeopardized by the encroachment of the recreational pathway. Specifically, the Pier 1 Shed area should not be a pathway destination as shown in the current draft of the *Hilo Bayfront Trails Master Plan*. Locating the trailhead inside the harbor area will expose this industrial area to public access. Therefore, the Master Plan should consider relocating the trailhead away from the Pier 1 Shed area to a site near the harbor entrance at Kuhio Street. For specific comments regarding pedestrian access in the harbor area, please refer to the notations on the attached pages (4-17, 4-18) from the Master Plan.

3. Kumao Street is being developed as the entrance for cargo operations. Since large, commercial vehicles are less maneuverable than street vehicles, DOT is concerned that heavy commercial vehicle traffic threatens the safety of pathway users at this intersection.

4. The DOT Harbors Division is currently updating the *Hawaii Island Commercial Harbors 2035 Master Plan*. The harbor land uses identified on page 4-18 were taken from an earlier edition of the plan and may change as a result of the interactive planning process.

5. DOT requests four (4) hard copies of the DEA for review.

DOT appreciates the opportunity to provide comments. If there are any questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 587-2356.

Very truly yours,

BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

Encls.

c: Katherine Kealoha, Office of Environmental Quality Control
Elizabeth Dykstra, Hawaii County Resource

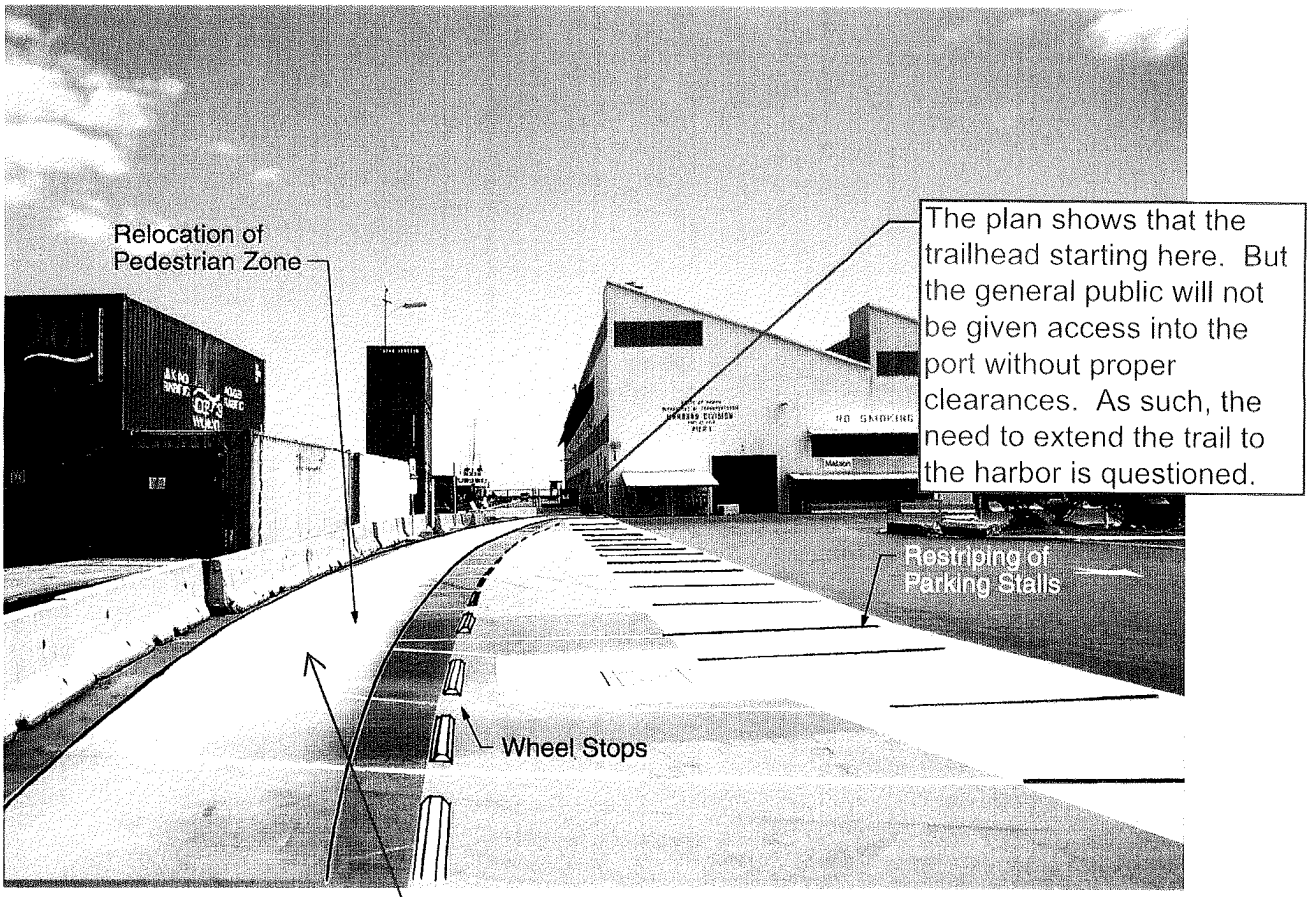


Figure 4.24: Short-term pedestrian alig main gate at Kūhiō Street.

This alignment places the pedestrian pathway in close proximity to active container operations. These containers could potentially fall and kill a pedestrian.

the main gate at Kūhiō Street (Figure 4.24). A trailhead sign would also be located at the Hilo Harbor facilities (Figure 4.25).

Long-term improvements include trail markings on pedestrian walkways and bikeway from the future passenger terminal at Pier 5 (Figure 4.26).

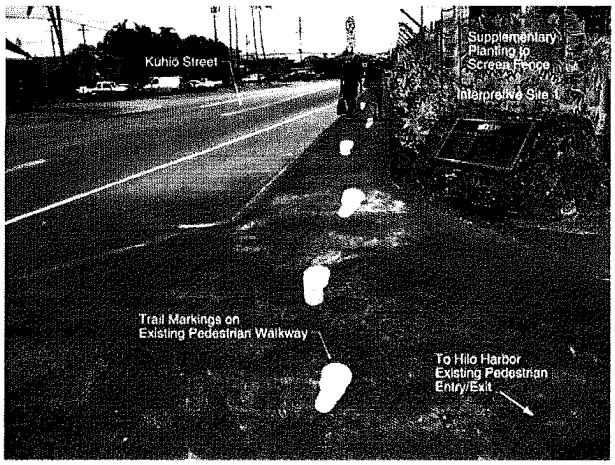
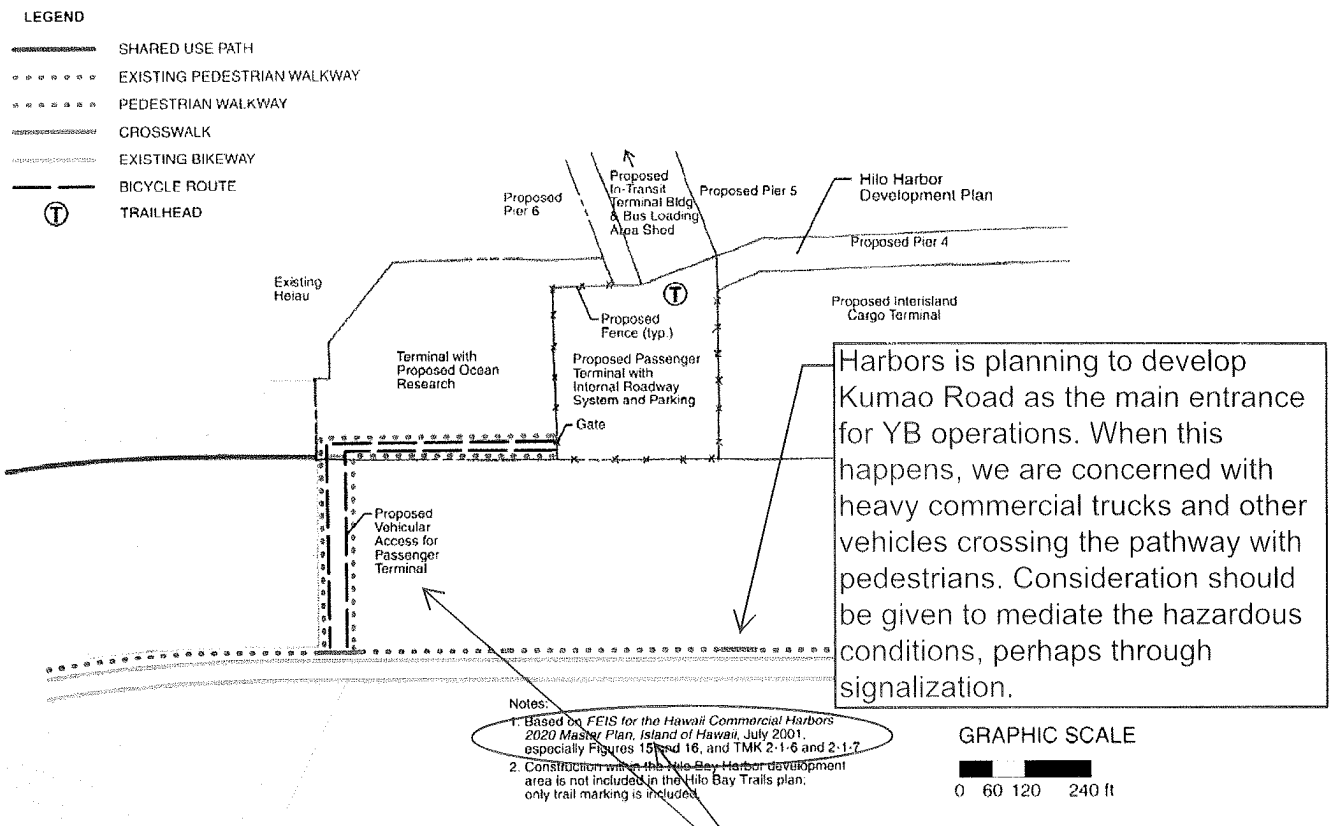


Figure 4.25: Signage at Interpretive Site1—which interprets Hilo's early trade and commerce--will remain at this location, where Pier 1 is visible.

Future Trail Destinations

Future destinations for the Hilo Bayfront Trails are the result of community input at public meetings and in user survey responses. The most often mentioned destination is the University of Hawai'i at Hilo to the south. The bicycle lanes on Manono Street can provide future connection to bicycle facilities that have already been constructed on East and West Kawili Streets.



Harbors is planning to develop Kumao Road as the main entrance for YB operations. When this happens, we are concerned with heavy commercial trucks and other vehicles crossing the pathway with pedestrians. Consideration should be given to mediate the hazardous conditions, perhaps through signalization.

Figure 4.26: Long-term trail alignments on Huipu Street connect the Kalanianaole Street trail segments with Hilo Harbor and the shared use path aligned within the former railro

Note: We are updating the master plan with the HAWAII ISLAND COMMERCIAL HARBROS 2035 MASTER PLAN. Anticipated completion: end 2009. The above uses are subject to change.

The second and third most popular future destinations for the trail are Ric Keaukaha. The Master Plan includes connection to existing pedestrian an Harbor.

Alignments to the future trail destinations of Honoli'i Bay and the Hāmākua Coast could occur from the bicycle facilities on Kamehameha Avenue or Bayfront Highway or via the bicycle route on Wailuku Drive.

Links to Wailuku River State Park can be made via the Master Plan bicycle facilities on Waiānuenue Avenue and Wailuku Drive.

Conclusion

The Hilo Bayfront Trails Master plan represents the vision expressed by Hilo residents and stakeholder during the public community meetings and Stakeholder Advisory Committee meetings. While it may seem ambitious, the plan provides a fully-integrated and coordinated tool that the Hilo community can utilize for implementing their vision as short-term and long-term projects as funding is available.

Chapter 5 is a step-by-step guide for implementing the Hilo Bayfront Trails Master Plan.

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD09/4413

July 10, 2009

Ron Terry
Geometrician Associates LLC
PO Box 396
Hilo, HI 96721

RE: Early consultation for Hilo Bayfront Trails Project Environmental Assessment.

Aloha e Ron Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of your June 2, 2009, letter requesting comments on the above-mentioned project. The County of Hawai'i is planning a comprehensive system of connected trails and parks along Hilo Bay. The purpose of the trail system is to provide multi-use access as well as recreational and interpretive opportunities in the project area for Hilo residents and visitors. OHA has reviewed the project and offers the following comments.

The Draft Environmental Assessment should include a Cultural Impact Assessment (CIA), in accordance with Chapter 343 of the Hawaii Revised Statues (HRS). The CIA should include information relating to the Native Hawaiian practices and beliefs associated with the general area of the project site, and it is recommended that the community be involved in this assessment. Consideration must also be afforded to any individuals accessing the project area for constitutionally protected traditional and customary purposes, in accordance with the Hawai'i State Constitution, Article XII, Section 7.

OHA requests clarification whether an archaeological inventory survey for the project will be submitted to the State Historic Preservation Division for review and approval. If so, OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or

archaeological sites identified within the archaeological inventory survey. We request the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the project, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

In addition, OHA recommends that the applicant use native vegetation in its landscaping plan for subject parcel. Landscaping with native plants furthers the traditional Hawaiian concept of mālama 'āina and creates a more Hawaiian sense of place.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Hilo CRC Office

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

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

IN REPLY REFER TO:

HWY-PS
2.2690

August 6, 2009

Mr. Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Subject: Early Consultation, Draft Environmental Assessment
Hilo Bayfront Trails Project, Hawaii, South Hilo, Waiakea, Ili Pi'opi'o, Kukuau 1, Kukuau 2, Ponahawai, Punahoa 2, Pi'ihonnua,
TMK: (3) 2-1 through 4, various plats

The following comments supplement our July 6, 2009 letter (STP 09-071/STP 8.3321) commenting on the subject Draft Environmental Assessment (DEA):

1. It should be noted that the old Bayfront Highway along the Hilo Bayfront Beach Park is used as an emergency detour route when the intersection of Pauahi Street and Kamehameha Avenue is flooded and impassable. Locked gates near each end of the old Bayfront Highway prevent general use of this paved road, which is opened when Kamehameha Avenue is flooded. We recommend that the Draft Environmental Assessment (DEA) specifically state the need to retain this roadway for such emergency purposes.

2. We recommend including a quantitative comparison of the cost and benefits to providing new parallel facilities where separate pedestrians and bicyclists facilities already exist on both the mauka and makai sides of the Wailoa Bridge. The DEA should also include an analysis of the impact the proposed removal of the right-turn/merge lane would have on traffic operations. The right-turn lane is used daily, not just when the Pauahi Street intersection with Kamehameha Avenue is flooded.

3. In the first sentence of paragraph 5, *Roadways*, on page 3-4, the designation for Kamehameha Avenue should be changed from Route 11 to Route 19. The main

transportation artery across the bayfront is Route 19, which has both State and County segments. The State jurisdiction includes Bayfront Highway; Pauahi Street makai of Kamehameha Avenue; Kamehameha Avenue from the west side of Wailoa Bridge to Kalanianaole Street, and Kuhio Street. The County jurisdiction includes Kamehameha Avenue from the west side of Wailoa Bridge to Pauahi Street and Kalanianaole Street, except for a few hundred feet on either side of Kuhio Street.

4. The proposed multi-use path improvements must comply with the Americans with Disabilities Act with respect to the existing crosswalk and sidewalk ramps at the intersection of Kamehameha Avenue and Lihiwai Street.

5. Improvements within the State highway right-of-way must be planned, designed and constructed to current State requirements. A permit is required for work within the State highway right-of-way and construction plans must be submitted to the Highways Division Hawaii District Office for review and approval.

If you have any questions, please contact Robert Miyasaki, Systems Planning Engineer, Highways Division, at (808) 587-6336.

Very truly yours,

BRENNON T. MORIOKA, Ph.D., P.E.
Director of Transportation

ENVIRONMENTAL ASSESSMENT, HILO BAYFRONT TRAILS
APPENDIX 2
Property Identification, Ownership, and Use

Parcel listings are generally in order from Downtown Hilo to Hilo Harbor.

TMK #	Owner (See Note 1)	Current Use (see Note 2)	Trail Action (see Note 3)
PARCELS			
Kaipalaoa Landing			
2-3-4:1	State	Kaipalaoa Landing; vehicular roadway with metal gate for access to Wailuku River sewage pump site; Coast Guard Light House.	Trail markings on existing paving; gate renovation as necessary to allow pedestrian access when the metal gate is closed; interpretive signage/monuments 22 and 23, possibly combined as one.
Mo‘oheau Park			
2-3-1:2	State	Mo‘oheau Bus Terminal; one-way vehicular entry drive; pedestrian walkway from Kamehameha Ave. pedestrian crossing; Mo‘oheau Bandstand; lawn area with large canopy trees; baseball field and small storage structure; chain link fence at edge of Bayfront Highway (329 Kamehameha Ave).	Shared use path (see Note 6) with *ahupua‘a* plaques (18b, 19b); trail markings on existing pedestrian walkway; trailhead sign; interpretive signage/ monument 18b, 19b; landscape enhancement along mauka side of existing fence.
2-2-5:2	State/County Exec. Ord. No. 1541	Ball fields; 2 off-street parking lots, one with low retaining wall on two sides; coconut palm grove; chain link fence at edge of Bayfront Highway.	Shared use path with *ahupua‘a* plaque (16b); wheel stops in the makai stalls of parking lots; reconfiguration of easternmost parking lot and associated low retaining wall demolition to accommodate shared use path; relocation of approx. 7 coconut palms; landscape enhancement along mauka side of existing fenceline; interpretive sign/monument 16b.
2-2-4:35	State	Lawn area with exceptional monkeypod tree.	Shared use path; landscape enhancement along mauka side of existing fence.
2-2-4:28	State	Lawn area with exceptional monkeypod trees.	Shared use path with *ahupua‘a* plaque (15b); interpretive signage/monument 15b.
Waiolama Canal Area			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-2-6:26	State	Lawn area with coconut palms.	Shared use path, unless this alignment can be accommodated completely in 2-2-6:1.
2-2-6:1	State/County Exec. Ord. 2921	Flood control area with berm; lawn area with grove of coconut palms along Ponahawai St.; open lawn area with a row of rainbow shower trees along Kamehameha Ave. and adjacent to Kumu St. parking and sidewalk.	Shared use path with ahupua‘a plaque (18a); trailhead sign; parking lot (approx. 20 stalls); interpretive signage/monument 18a; rainbow shower tree relocation (8) between berm and Kamehameha Ave. sidewalk.

Waiolama Canal Area, continued			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-2-7:18	State (Division of State Parks)	Fields for soccer (4 youth); Waiolama Canal; shade structure; and announcement board.	Two-way bicycle route along parking lot drive .
2-2-4:2	State/County Exec. Ord. 2921	Fields for soccer (3 older youth); rainbow shower trees along Kamehameha Ave.; chain link fence 40'-0" from mauka edge of existing sidewalk along Kamehameha Ave. (19 Kumu Street)	Shared use path with ahupuaʻa plaque (16a) along makai side of existing chain link fence paralleling Kamehameha Ave.; shared use path parallel to Pauahi Street; footing for shared use path bridge; trailhead sign.
2-2-11:1	State/County of (Division of State Parks Exec. Ord. 2921	Fields for soccer (3 youth); Waiolama Canal with adjacent shade trees; bridge; rest room and outdoor shower area; unpaved parking area bounded by wheel stops; shade trees and coconut palms near top of slope (45 Kumu St.).	Shared use path with ahupuaʻa plaque (16a); interpretive signage/monument 16a, 17; native tree grove (15) on top of slope .
2-2-12:16	State	Lawn area with shade trees and palms; Waiolama Canal.	Shared use path; shared use path bridge over Waiolama Canal; interpretive signage/ monument 15a.
2-2-6:27	M.S. Petroleum Corp.	Gas station (434 Kamehameha Ave.).	Potential future purchase to connect shared use path to Ponahawai St./Kamehameha Ave. corner.
2-2-4:60	Dragon Pacific Investment Inc.	Gas station (744 Kamehameha Ave.).	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
Wailoa River State Recreation Area			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-2-4:25	Hilo Bayside LLC.	Gas station 774 Kamehameha Ave.).	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
2-2-4:1	State (Division of State Parks) Exec. Ord. 2921	Vehicular entry via Piʻopiʻo St. to recreation area; lawn areas with trees; Wailoa River State Recreation Area signage.	Shared use path.
2-2-3:3	State (Division of State Parks) Exec. Ord. 2921	Bishop St.; portion of Punahoa St. and Piʻopiʻo St.; King Kamehameha statue and interpretive signage (2); Pacific Tsunami Museum Shinmachi interpretive signage (1); lawn area with canopy trees and coconut palms; fields for soccer (3).	Shared use path up to and over Piʻopiʻo St. bridge; barrier on bridge to separate shared use path from vehicular lanes marked pedestrian crossings at Piʻopiʻo St. and Bishop St.

Wailoa River State Recreation Area, continued			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-2-12:1	State (Division of State Parks) Exec. Ord. 2921	Lawn area with canopy trees and coconut palms; Pi‘opi‘o St. bridge.	Shared use path after Pi‘opi‘o Street bridge crossing if not accommodated in 2-2-13:3.
2-2-13:3	State (Division of State Parks) Exec. Ord. 2921	Wailoa Center; War Memorial; Shinmachi Tsunami Memorial; vehicular roadways and parking; Hoakimau Pond; Wailoa River with single arched bridge; asphalt paths; lawn areas with canopy trees and coconut palms.	Shared use path.
2-2-31:1	State (Division of State Parks) Exec. Ord. 2921	Waiākea Fish Pond and some surrounding land; migratory bird resting area “fingers”; Grant of Easement [non-exclusive] No. S-4553 executed May 6, 1977: grantor State of Hawaii, Department of Land and Natural Resources; for grantee Waiākea Corporation “to provide a public pedestrian pathway or walkway across its adjoining land connecting portions of Wailoa River State Park as part of its improvements.” (200 Manono Street).	Shared use path with marked pedestrian crossings at boat ramp, from Pi‘ilani St. proposed bike route; and across large pavilion service drive; trailhead sign; interpretive signage/monuments 26, 27a, 27b, 28; potential adjustment to a portion of covered walkway at pavilion cluster to accommodate bicycles on shared use path; potential moving bridge over Wailoa River; potential boardwalk within Grant of Easement, depending on existing conditions determined by survey.
2-2-2:1	State (Division of State Parks) Exec. Ord. 5361	Lawn area with trees and palms.	Shared use path; potential bridge footing; interpretive signage/monument 14.
2-2-14:2	State (Division of State Parks) Exec. Ord. 2921	Sloped and level lawn areas with canopy trees and coconut palms.	Shared use path; interpretive signage/monument 29.
2-2-29:8	State	Unimproved off-street parking; lawn area with canopy trees (885 Kilauea Ave.).	Shared use path; trailhead sign; interpretive signage/monument 30.
2-2-29:27	State (Division of State Parks) Exec. Ord. 2658	Moho‘uli Pond and its edges, including “fast land.”	Shared use path; potential bridge at the mouth of the pond .

Wailoa River State Recreation Area, continued			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-2-29:1	State (Division of State Parks) Exec. Ord. 2921	Waiākea Stream from outlet of flood control channel; lawn area with trees and palms south of the stream and adjacent to Waiākea Pond; portion of Maile Street (1001 Kilauea Ave).	Shared use path; potential bridge; trailhead sign; parking lot (approx. 40 stalls); small qty. tree relocation.
2-2-53:19	Gordon Chang et al.	Private roadway (Maile Street).	Shared use path.
2-2-53:20	Rex Andrew Ramsey II	Unused.	Shared use path.
2-2-53:23	State (Division of State Parks)	Lawn area with trees and palms adjacent to Waiākea Pond (1001 Kilauea Ave).	Shared use path.
2-2-31:15	State (Division of State Parks) Exec. Ord. 2201	Vegetated area; storm drain easement at south end of parcel.	Shared use path (possibly a boardwalk with footings in water); possible storm drain extension.
Hoʻolulu Complex			
2-2-33:1	State/County Exec. Ord. 1255	Hoʻolulu Complex (260 Kalanikoa St).	Interpretive signage/monument 31.
Hilo Bayfront Beach Park			
2-2-4:56	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod trees.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-3:46	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod tree.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-02:35	State	Portion of Hilo Bayfront Beach Park.	Trail markings on future shared use path and interpretive signage/monument 13 coordinated with Hilo Bayfront Beach Park improvement plans.
2-2-01:27	State	Portion of Hilo Bayfront Beach Park (1241 Bayfront Hwy).	Trail markings on future shared use path and interpretive signage/monument 12 coordinated with Hilo Bayfront Beach Park improvement plans.
Waiākea Peninsula			
2-1-1:12	State	Golf Course and driving range (1713 Kamehameha Ave).	Shared used path; trailhead sign.
2-1-1:102	State	Berm at corner of Lihiwai Street and Kamehameha Avenue.	New shared use path with inside railing; trailhead sign.
2-1-3:1	State/County Exec. Ord. 3807	Liliʻuokalani Gardens (49 Banyan Dr).	Trail markings on existing pedestrian walkways; one-way bicycle route; interpretive signage/monuments 9, 10a, 10b, 11.

Moku Ola (Coconut Island)			
TMK #	**Owner (See Note 1)**	**Current Use (see Note 2)**	**Trail Action (see Note 3)**
2-1-3:19	State/County Exec. Ord. 585	Moku Ola or Coconut Island, Por. Lili‘uokalani Gardens (77 Keli‘ipio Pl).	Trail markings on existing pedestrian walkways; interpretive signage/monuments 7, 8 to be coordinated with interpretive signage by Pacific Tsunami Museum.
Reed's Bay Beach Park			
2-1-5:1	State	Reed’s Bay Beach Park (225 Banyan Drive).	Trail markings on future pedestrian walkway and interpretive signage/monument 5 to be coordinated with implementation of Reed's Bay Beach Park improvements.
Kanakea Pond (Ice Pond)			
2-1-6:10	State/County Exec. Ord. 572	Kanakea Pond (Ice Pond).	Cantilever pedestrian boardwalk and viewing deck.
Hilo Harbor Expansion			
2-1-9:7	State	Dept. of Transportation, Hilo Harbor, 99 Kuhio Street.	Interim trail markings and marked pedestrian zone and crossing on existing paving from Pier 1 shed to main gate at Kuhio Street. This may require adjusting the location of parking stalls and barriers along this route.

RIGHTS-OF-WAY (R/W) All listings are county rights-of-way unless noted otherwise		
Description	**Owner (See Note 1)**	**Current Use (see Note 2)**
Wailuku Drive: Kamehameha Ave./Ka‘iulani St.	One-way (Kamehameha Ave./Kino‘ole St.) and two-way (Kino‘ole St./Ka‘iulani St.) vehicular roadway; sidewalk on Downtown Hilo side; curb and gutter; parking; marked pedestrian crossings with ramps; riverside planting.	One-way and two-way bicycle routes; interim trail markings on existing pedestrian walkway; trail markings on future pedestrian walkway in Wailuku Riverwalk; signage/monument 24, 25 coordinated with Pacific Tsunami interpretive signage and implementation of Wailuku Riverwalk plans.
Kekaulike Street: Wailuku Dr./Waiānuenue Ave.	One-way vehicular roadway; curb and gutter; sidewalks; marked pedestrian crossings.	Trail markings on existing pedestrian walkway.
Ka‘iulani Street: Wailuku Dr./Waiānuenue Ave.	Two-way vehicular roadway.	Two-way bicycle routes.
Kapi‘olani Street: Waiānuenue Ave./Haili St.	Two-way vehicular roadway (except on certain days and times); sidewalks; curb and gutter; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.

RIGHTS-OF-WAY (R/W), continued All listings are county rights-of-way unless noted otherwise		
Description	**Owner (See Note 1)**	**Current Use (see Note 2)**
Waiānuenue Avenue: Kamehameha Ave./Haili St.	One-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Haili Street: Kapiʻolani St./Kamehameha Ave.	Two-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Bayfront Highway STATE: Wailuku River Bridge/Pauahi St.	Two-way vehicular roadway; planted median (noncontinuous); paved shoulders; mauka side turf strip with chain link fence at property line; makai shoreline revetment wall (noncontinuous).	Two-way bicycle lanes; marked pedestrian crossing at Waiānuenue Ave.; sign for Hāmākua-bound users of proposed Bayfront Highway bike lane that there is no outlet until Waiānuenue Ave. proposed marked pedestrian crossing.
Bayfront Highway COUNTY: Pauahi St./Wailoa Bridge	Portion of Hilo Bayfront Beach Park used for parking and driving lanes and bicycle route.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
Kamehameha Avenue COUNTY: Waiānuenue Ave./Kamehameha Ave. STATE	Two-way vehicular roadway with painted median (noncontinuous); paved shoulders; parking; curb and gutter; sidewalks; marked pedestrian crossings; rainbow shower street trees.	Two-way bicycle lanes; trail markings on existing pedestrian walkways; interpretive signage/monuments 19a, 20, 21 in existing planting areas; ahupuaʻa plaques 19a, 20, 21 embedded in existing pedestrian walkway.
Kamehameha Avenue STATE: Kamehameha Ave. COUNTY/Kalanianaole St.	Two-way vehicular lanes; curb and gutter (noncontinuous); transitional pedestrian facilities; Wailoa Bridge with curb and gutter, pedestrian walkways with railings; makai asphalt pedestrian paving from Lihiwai St. to Banyan Dr.; paved shoulders.	Two-way bicycle lanes; bridge lane restriping, barrier installation; sidewalk renovations/expansion for shared use path over bridge.
Kumu Street; Kamehameha Ave./end	Two-way parking aisle; curb and gutter; parking; sidewalks.	Two-way bicycle route.
Piʻilani Street: Kanoelehua Ave./Wailoa River State Recreation Area	Two-way vehicular roadway.	Two-way signed shared road; two-way bicycle routes.
Manono Street: Kamehameha Ave./Piʻilani St.	Two-way vehicular roadway; sidewalk on Hoʻolulu Complex side; street trees.	Two-way bicycle lanes; marked pedestrian crossings at Kawelolani St. R/W and at Piʻilani Street.
Lihiwai Street: Kamehameha Ave./Banyan Dr.	Two-way vehicular roadway; parking; curb and gutter; sidewalks; marked pedestrian crossings.	Two-way bicycle routes; trail markings on existing pedestrian walkway; trailhead signs (2) .
Banyan Drive: Banyan Way/Lihiwai St.	Two-way vehicular roadway with planted median(noncontinuous); curb and gutter; parking; sidewalk on makai side; banyan trees.	Two-way bicycle routes; trail markings on existing pedestrian walkway; shared use path; trailhead signs (2).

RIGHTS-OF-WAY (R/W), continued All listings are county rights-of-way unless noted otherwise		
Description	**Description**	**Description**
Banyan Drive: Banyan Way/Kamehameha Ave.	Two-way vehicular roadway with planted median; paved shoulder; curb and gutter.	Two-way bicycle routes
Banyan Way: Banyan Dr./Kalanianaole St.	Two-way vehicular roadway; parking on makai side; makai asphalt curbs and asphalt pedestrian walkway with metal railing on retaining wall.	Two-way bicycle routes; trail markings on existing pedestrian walkway.
Kalaniana‘ole Street: Banyan Way/Kūhiō St.	Two-way vehicular roadway with shoulder for bike route; asphalt curb and pedestrian walkway (discontinuous); landscape strip; R/W fronting 21-7:9 improved with curb, gutter, sidewalk, landscape strip.	Makai side: curb, gutter, pedestrian walkway with trail markings; shoulder for bicycle route.
Kūhiō Street: Kalaniana‘ole St./Hilo Harbor main gate	Two-way vehicular roadway with shoulders; curb, gutter, chain link fence with barbed wire, and pedestrian walkway on west side of R/W.	West side: trail markings on existing pedestrian walkway; landscape enhancements; interpretive signage/monument 1 interim location.

NOTES:

1 TMK numbers and ownership were researched on the county website: TMK Maps and Real Property Tax, respectively.

2 Current uses were determined through site visits, site and aerial photography, street videography, and plan documents.

3 All trail actions are new except when specified existing.

4 Some parcels need verification of State/County ownership.

5 Some TMKs from Master Plan not included in this list due to a) elimination of action from consideration or b) phasing of action is uncertain or too far in future for current consideration.

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ENVIRONMENTAL ASSESSMENT, HILO BAYFRONT TRAILS
APPENDIX 3
Plant Species Identified in Hilo Bayfront Trails Segments

Scientific Name	Family	Common Name	Life Form	Status*	Location**
Ageratum conyzoides	Asteraceae	Maile honohono	Grass	A	S, Br,
Aleurites moluccana	Euphorbiaceae	Kukui	Tree	A	W
Alocasia macrorrhiza	Araceae	Ape	Shrub	A	S
Alpinia purpurata	Zingiberaceae	Red Ginger	Shrub	A	S
Araucaria heterophylla	Araucariaceae	Norfolk pine	Tree	A	S
Axonopus compressus	Poaceae	Wide-leaved carpet grass	Grass	A	S,W
Bidens alba var. *radiata*	Asteraceae	Beggar's tick	Herb	A	S,W
Bougainvillea sp.	Nyctaginaceae	Bougainvillea	Shrub	A	S
Brachiaria mutica	Poaceae	California grass	Grass	A	S, B
Buddleia asiatica	Buddlejaceae	Dog tail	Shrub	A	S
Canavalia cathartica	Fabaceae	Mauna Loa	Vine	A	S
Cassia fistula	Fabaceae	Golden Shower Tree	Tree	A	S
Cassia x nealiae	Fabaceae	Rainbow shower tree	Tree	A	So, W, Br
Casuarina equisetifolia	Casuarinaceae	Ironwood	Tree	A	S
Cenchrus echinatus	Poaceae	Common sandbur	Grass	A	S
Chamaecrista nictitans	Fabaceae	Partridge Pea	Herb	A	S, W
Chamaesyce hirta	Euphorbiaceae	Garden Spurge	Herb	A	S
Chamaesyce hypericifolia	Euphorbiaceae	Graceful spurge	Herb	A	S
Chloris barbata	Poaceae	Swollen finger grass	Grass	A	S, W
Clusia rosea	Clusiaceae	Autograph tree	Tree	A	S, W
Cocos nucifera	Arecaceae	Niu	Tree	A	Wai, S, W, Br
Commelina diffusa	Commelinaceae	Honohono	Herb	A	S,W, B
Cordia subcordata	Boraginaceae	Kou	Tree	I	S,B
Cordyline fruticosa	Agavaceae	Ki	Shrub	A	S,W,Ka
Crocosmia x crocosmiiflora	Iridaceae	Montbretia	Herb	A	S
Crotalaria sp.	Fabaceae	Rattlepod	Herb	A	S
Cynodon dactylon	Poaceae	Bermuda grass	Grass	A	S, W, Br, B, So
Dactyloctenium aegyptium	Poaceae	Beach wiregrass	Grass	A	S
Desmodium incanum	Fabaceae	Desmodium	Herb	A	S
Desmodium intortum	Fabaceae	Desmodium	Vine	A	S
Dieffenbachia sp.	Araceae	Dumb cane	Shrub	A	Ka
Dissotis rotundifolia	Melastomataceae	Dissotis	Shrub	A	Ka
Dracaena marginata	Agavaceae	Money tree	Tree	A	S
Drymaria cordata var. *pacifica*	Caryophyllaceae	Pilipili	Herb	A	S
Eleusine indica	Poaceae	Wire grass	Grass	A	S,W
Emilia fosbergii	Asteraceae	Pualele	Herb	A	S,W
Epipremnum aureum	Araceae	Pothos vine	Vine	A	Ka
Hibiscus sp.	Malvaceae	Hibiscus	Shrub	A	S,W
Hyptis pectinata	Lamiaceae	Comb hyptis	Shrub	A	S
Indigofera suffruticosa	Fabaceae	Indigo	Shrub	A	S, W
Ipomoea pes-caprae	Convolvulaceae	Pohuehue	Vine	I	S
Ipomoea triloba	Convolvulaceae	Little bell	Vine	A	S

Justicia betonica	Acanthaceae	White shrimp plant	Shrub	A	Ka
Macaranga mappa	Euphorbiaceae	Bingabing	Tree	A	S, W, Ka
Macroptilium lathyroides	Fabaceae	Cowpea	Vine	A	S, W
Mangifera indica	Anacardiaceae	Mango	Tree	A	W, Ka
Melinus minutiflora	Poaceae	Molasses grass	Grass	A	S
Melochia umbellata	Malvaceae	Melochia	Tree	A	W, Ka
Mimosa pudica	Fabaceae	Sensitive plant	Herb	A	S, W
Momordica charantia	Cucurbitaceae	Balsam Pear	Vine	A	S, W
Monstera deliciosa	Araceae	Swiss cheese plant	Vine	A	Ka
Morinda citrifolia	Rubiaceae	Noni	Shrub	A	S
Musa sp.	Musaceae	Banana	Tree	A	W
Nephrolepis multiflora	Nephrolepidaceae	Sword fern	Fern	A	S, Ka
Oplismenus hirtellus	Poaceae	Basket grass	Grass	A	Ka
Paederia foetida	Rubiaceae	Maile pilau	Vine	A	W, Ka
Pandanus tectorius	Pandanaceae	Hala	Tree	I	S, W
Panicum maximum	Poaceae	Panicum	Herb	A	S, W, B, Ka
Panicum repens	Poaceae	Torpedo grass	Grass	A	B
Paspalum conjugatum	Poaceae	Hilo grass	Grass	A	S, W, B, Ka
Paspalum vaginatum	Poaceae	Seashore paspalum	Grass	A	S
Pennisetum purpureum	Poaceae	Elephant grass	Grass	A	B
Persea americana	Lauraceae	Alligator pear	Tree	A	W, Ka
Phaeomeria magnifica	Zingiberaceae	Torch ginger	Shrub	A	Ka
Phlebodium aureum	Polypodiaceae	Phlebodium	Herb	A	W, Ka
Phymatosorus grossus	Polypodiaceae	Maile-scented Fern	Herb	A	Ka
Pluchea symphytifolia	Asteraceae	Sourbush	Shrub	A	S, W
Plumeria sp.	Apocynaceae	Plumeria	Tree	A	S, W
Psidium guajava	Myrtaceae	Guava	Tree	A	S, Ka
Psilotum nudum	Psilotaceae	Moa	Herb	I	S
Pteris cretica	Pteridaceae	Cretan brake	Fern	I	S
Rhynchelytrum repens	Poaceae	Natal red-top	Grass	A	S
Samanea saman	Fabaceae	Monkeypod	Tree	A	Br
Scaevola taccada	Goodeniaceae	Naupaka	Shrub	I	S, W
Schefflera actinophylla	Araliaceae	Octopus tree	Tree	A	S, W
Setaria palmifolia	Poaceae	Palm grass	Grass	A	S, Ka
Sida rhombifolia	Malvaceae	Cuba Jute	Herb	A	S
Spathodea campanulata	Bignoniaceae	African Tulip tree	Tree	A	S, W
Sporobolus sp.	Poaceae	Dropseed	Grass	A	S, W
Stachytarpheta jamaicensis	Verbenaceae	Jamaica vervain	Shrub	A	S, W
Terminalia catappa	Combretaceae	False kamani	Tree	A	S, W, Ka
Thespesia populnea	Malvaceae	Milo	Tree	I	S
Trema orientalis	Cannabaceae	Gunpowder tree	Tree	A	W, Ka
Vigna marina	Fabaceae	Nanea	Vine	I	S
Waltheria indica	Sterculiaceae	Uhaloa	Herb	I	S
Wedelia trilobata	Asteraceae	Wedelia	Herb	A	S,W,Br,

* A = Alien, I = Indigenous. Not all ornamental species listed.
** location: S = Strand, So = Waiolama Soccer Fields, B = Alenaio Flood Channel berm, W = Waiakea Pond (Wailoa), Br = Wailoa Pond proposed bridge, Ka = Kawelolani St. area, Wai = Wailuku river-Waianuenue area

ENVIRONMENTAL ASSESSMENT

HILO BAYFRONT TRAILS

Hawai‘i County
Department of Research and Development

Appendix 4a
Cultural Impact Assessment

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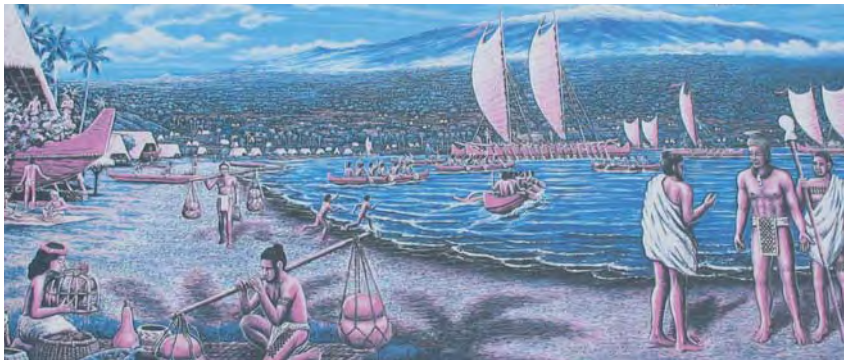
RC-0649

Cultural Impact Assessment for the Proposed Hilo Bayfront Trails Project



Pi‘ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea *ahupua‘a*
South Hilo District
Island of Hawai‘i

DRAFT VERSION

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ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0649

Cultural Impact Assessment for the Proposed Hilo Bayfront Trails Project

Pi‘ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea *ahupua‘a*
South Hilo District
Island of Hawai‘i

RECHTMAN CONSULTING

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INTRODUCTION

At the request of Ron Terry, Ph.D. of Geometrician Associates LLC, on behalf of the County of Hawai‘i, Rechtman Consulting, LLC has prepared this cultural impact assessment for the Hilo Bayfront Trails project. This project was initiated with a grant from the Hawai‘i Tourism Authority through its Natural Resources Program, with matching resources provided by the County of Hawai‘i. In overview, the Hilo Bayfront Trails Project will incorporate a variety of multimodal (shared pedestrian and bicycle) paths, pedestrian walkways, dedicated bicycle paths, and dedicated bicycle lanes within existing vehicular roadways. The project area extends over two miles from the Wailuku River to the Kūhiō Street entrance of the Hilo Harbor (Figure 1). It lies in close proximity to Hilo Bay, spans five primary[1] *ahupua‘a* in the district of South Hilo, and directly involves forty separate Tax Map parcels and twenty roadway rights-of-way (Appendix 1). Most of this area is publicly owned open space under the jurisdiction of either the County of Hawai‘i Department of Parks and Recreation or the State of Hawai‘i Department of Land and Natural Resources State Parks Division (Figure 2).

This report is intended to accompany an Environmental Assessment being prepared in compliance with Hawai‘i Revised Statues Chapter 343. This study has been prepared pursuant to Act 50, approved by the Governor on April 26, 2000; and in accordance with the Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997.

Below is a description of the general project area and the proposed development activities. This is followed by a detailed background section providing a culture-historical setting and context to facilitate a more complete understanding of the potential significance of the cultural landscape and the historic and cultural properties within that landscape. Next, the consultation process is described, which is followed by a discussion of potential cultural impacts and the appropriate actions and strategies to mitigate any potential impacts.

PROJECT AREA DESCRIPTION AND PROPOSED DEVELOPMENT ACTIVITIES

The Hilo Bayfront Trails Project includes a variety of multimodal paths, pedestrian sidewalks, dedicated bicycle lanes and shared roads for bicycles spanning the more than two mile distance between Hilo Harbor and the Wailuku River (Figure 3). The project also proposes loops for the areas of downtown, Waiolama playfields, and Wailoa State Park; and also a multimodal loop at the County’s Bayfront Beach Park (see Figure 3). Specifically, at its eastern end the project begins at the Kūhiō Street entrance to the Hilo Harbor, where cruise ship passengers currently disembark. From Kūhiō Street, the trail is a shared use path that travels westward along Kalaniana‘ole Street to Banyan Way and then to Banyan Drive. Along Banyan Drive to Manono Street (the Waiākea Peninsula) there is the existing walkway, with a scenic coastal 0.6-mile loop around Queen Lili‘uokalani Gardens and out to Moku Ola (Coconut Island). In this area the trail includes a proposed shared-use path on the interior of Banyan Drive and along Kamehameha Avenue *mauka* of the peninsula, making a complete 1.4 mile circle around the peninsula’s Naniloa Golf Course. Existing parks present in this segment include Reed’s Bay County Beach Park, Coconut Island County Park, Lili‘uokalani Gardens County Park, the County recreational area known informally as “Isles”, and a small County recreation area called Happiness Gardens.

[1] Two (Kūkūau and Punahoa) of the five primary *ahupua‘a* are further divided into two parts, making seven *ahupua‘a*.

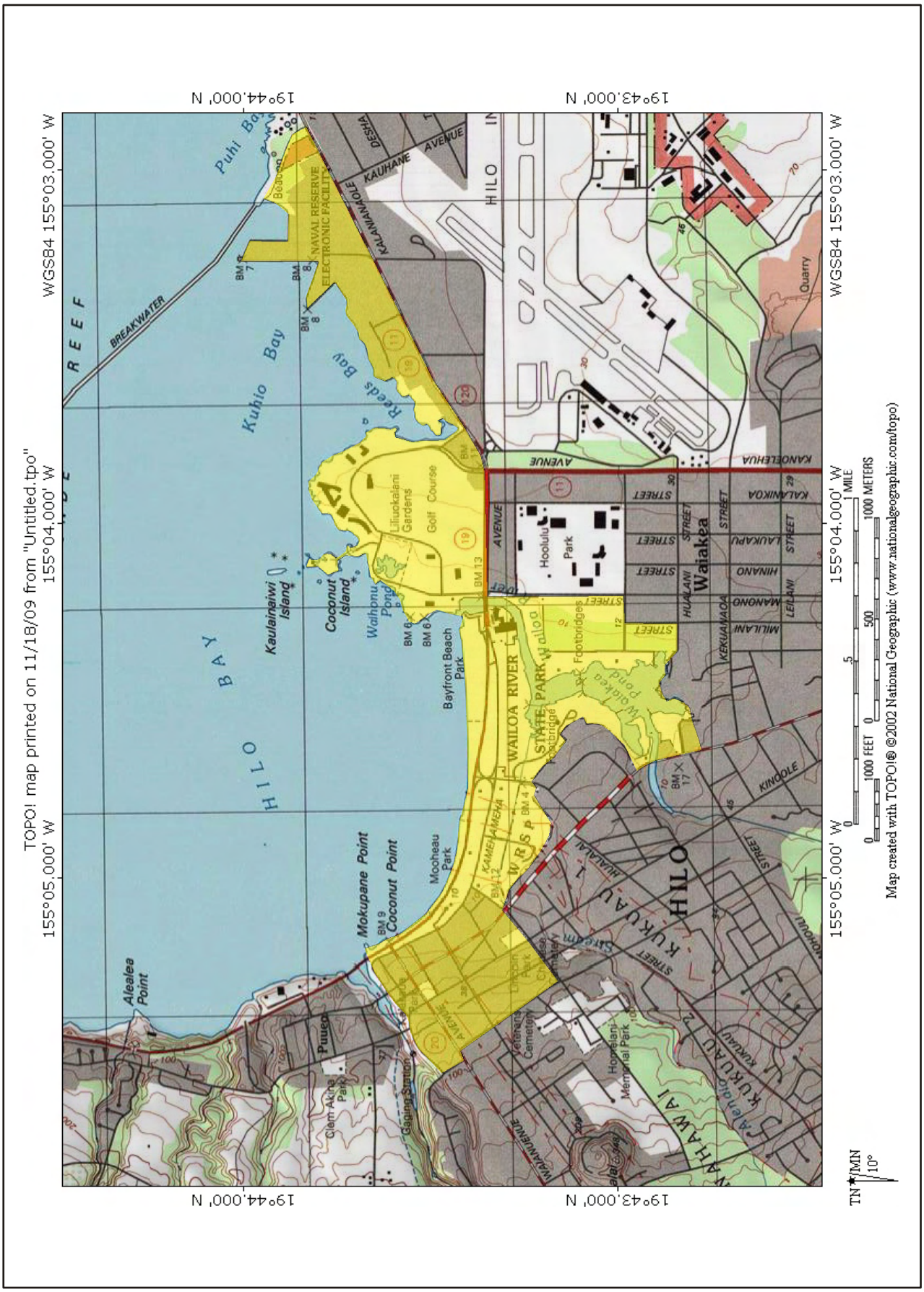

Figure 1. General location of the Hilo Bayfront Trails project (shaded yellow).

Figure 2. General project area showing land ownership.

Figure 3. Hilo Bayfront Trails master plan.

From the western intersection of Banyan Drive and Kamehameha Avenue, the project features a shared-use path extending west and *makai* of Kamehameha Avenue before looping toward the shore and the Hilo Bayfront Beach Park and the existing canoe *halau*. This segment includes Hilo Bayfront Beach Park. This multi-use path continues in a westerly direction, moving *mauka* of the Bayfront Highway at the Pauahi Street intersection and continues to the vicinity of the Hilo Farmers Market on Mamo Street in downtown Hilo. County recreational areas here include various multi-use playing fields between Kamehameha Avenue and Bayfront Highway and Mooheau Park.

The project includes a variety of additional loops of multi-use pathway extending *mauka* to be accessed from existing sidewalks along Pauahi Street. One would circle Waiākea Pond in Wailoa State Park and a portion of the Wailoa River, making use of three existing bridges and one more to be constructed, with side routes to Manono Street to the east and Kilauea Avenue to the southwest. Most of the route in the Wailoa State Park loop would occur on existing trails, streets, or across park lawns. Some areas would require substantial removal of vegetation, and one area would require acquisition of either property or easements. As currently planned, the trail would make a straight line between the pavilions at Wailoa State Park and Manono Street along Kawelolani Street, a "paper road" that is County property. Another roughly one-mile loop would circle a portion of the playfields *mauka* of the Waiolama Canal on the west side of Pauahi Street, with a side route along the *mauka* side of Kamehameha Avenue and along Ponahawai Street to Kīlauea Avenue. In downtown Hilo, the project includes use of existing sidewalks that would be marked to clearly guide trail users from the bay front area up Haili Street and Waiānuenue Avenue.

In a year-long collaborative process with key stakeholders as well as with the community at large, the following underlying mission for the Hilo Bayfront Trails Project was established: To increase non-vehicular access in and around the Hilo bay front area for both residents and visitors alike, enhancing the area's natural beauty and highlighting the area's cultural significance, while at the same time ensuring environmental protection for the fragile coastline and connecting waterways. Most of the trail alignments and proposed amenities are located close to the bay front and occur predominantly on public County and State road rights-of-way and other County and State lands. A few trail segments will require land purchases or easements across private lands (see Figure 2).

Trail alignments will provide the physical means for walking, running, biking or skating from one location to another within the project area. Trail amenities are located near the trail alignments to provide basic resources, trail information, and educational information about the natural and cultural resources of the project area. Some trail elements will be new to the project area; other trail elements already exist in the project area and will be incorporated into the Hilo Bayfront Trails project. The trail interfaces with infrastructure being developed in separate ongoing County Department of Parks and Recreation projects, including the Wailuku Riverwalk, the Hilo Bayfront Beach Park, the Reed's Bay Beach Park (which includes the Kūhiō-Kalaniana‘ole Park), and Kaipalaoa Landing (see Figure 3).

The Hilo Bayfront Trails project accommodates pedestrians, bicycles, and other non-motorized vehicles over a variety of trail alignments. These alignments are called "trails" to emphasize their recreational purpose and role in providing access to and enhancing views of the natural and cultural resources of the project area. All of the alignments will be paved; and links between types of alignments have been carefully considered to maximize connectivity of the entire network, adopting existing infrastructure wherever possible. In addition to new or newly marked paths, the project involves establishing new parking areas and landscape areas, and the placement of up to thirty interpretive signs identifying locations of interest (Table 1). Also, *ahupua‘a* and certain *‘ili* boundaries will also be marked along the course of the trail system, informing trail users which land division they are entering and which they are leaving in an effort to enrich the connection of past and present. Interpretive signage near these boundaries will describe the significance of the land divisions.

Table 1. Proposed interpretive location within the Hilo Bayfront Trails project area.

Location No.	*Theme(s)/Subjects for Interpretation*
1	Harbor: Hilo's early trade and commerce. Development of harbor facilities. Sugar trade.
2*	Abandoned Railroad Right-of-Way: 1878 act signed by King Kalākaua promoted the construction of railroads. Railroad important for carrying passengers as well as goods, most importantly sugarcane. Tsunami of April 1, 1946, shut down the railroad in Hilo.
3*	Fishponds: Ancient uses and historic uses.
4	Kanakea/Ice Pond: Traditional and modern uses.
5	Banyan Drive: Trees planted starting in 1933 honoring important visitors and others.
6	Makaokū: Traditional name for the area. Once the location of a significant and unique *heiau*. Discussion of heiau and associated ritual.
7	Mokuola (general): Puʻuhonua, healing waters.
8	Mokuola (specific): *Kaulaʻināiwi*, *Puaʻakāheka*.
9	Mauna Kea/Hilo Town: Clear day sign to see the entire landscape from coastal zone to mountain peak (from the realm [*wao*] of man to the realm of the gods).
10a-b	Queen Liliʻuokalani Gardens: Traditionally, Waihonu Pond. History of modern gardens.
11	Breakwater: Designed to calm the waters of the harbor, not as a protective measure against *tsunami*. Constructed between 1908 and 1929.
12	Hilo Iron Works Building: Hilo Iron Works in business from 1865 and ends 1983. Building is a C. W. Dickey design.
13	Hilo Bay: Traditionally called *Hilo one*. Hilo, the first moon phase, is mirrored in the shape of the bay, which housed Kamehameha's canoe fleets and remains the location of a recreational canoe fleet.
14	ʻIli Piʻopiʻo: Hilo residence of Kamehameha. Later Japanese community of Shinmachi, which was devastated by the April 1, 1946, tsunami. Never rebuilt and now used for sports fields.
15a-b	Waiākea/Kūkūau 1: Ahupuaʻa boundary.
16a-b	Kūkūau 1/Kūkūau 2: Ahupuaʻa boundary.
17	Agricultural (*kipi*) Area: River diversion into channel and unique form of agriculture.
18a-b	Kūkūau 2/Ponahawai: Ahupuaʻa boundary.
19	Ponahawai/Punahoa 1-2: Ahupuaʻa boundary. Waiolama, former marsh.
20	Punahoa 1-2/Piʻihonua: Ahupuaʻa boundary.
21	Hilo Landing/Pier: Built and rebuilt between 1863 and 1890 at the foot of Waiānuenue Avenue.
22	Kaipalaoa Heiau: Located in this general vicinity. Tied to ʻUmi and Kamehameha I and Liholiho. Destroyed in Kuakini's (1820s) time.
23	Piʻihonua/Wailuku River: Ahupuaʻa boundary. Wailuku means "waters of destruction." Accurate physical description and distinction. Home to Hina.
24	Maui's Canoe: Maui/Moʻo Kuna story.
25	Wailoa River/Small Boat Harbor: Former estuary area of the Waiākea Stream. Currently the Wailoa Sampan Basin and Small Boat Harbor.
26a-b	Chiefly Hawaiian Fishponds: Waiākea-Mohouli-Waiāhole-Kalepolepo. Collectively these ponds were stocked with the favorite fishes of the ruling chief and were considered to be significant places reserved for royal use.
27	Waiākea Mill: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use.
28	Waiākea Mill/Mohouli Pond: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use. Wall dividing traditional pond boundaries.
29	Kalepolepo: *ʻIli* boundary with Piʻopiʻo. Location of a former fishpond. Legendary competition grounds for Hilo chiefs. Ka-Miki story.
30	Hoʻolulu Complex: History of recreational facilities in this location, starting with the opening of Hoʻolulu Park in 1900 and including the Merrie Monarch Festival venue: the Edith Kanakaʻole Multi-Purpose Stadium.

*These locations were under consideration during the planning process but the trail as currently conceived no longer passes by these sites.

CULTURE-HISTORICAL BACKGROUND

Traditionally, greater Hilo was divided into three areas with place names that have their origins in legendary times: *Hilo-Hanakāhi* ("Hilo of the Chief Hanakāhi," which included Waiākea-Panaʻewa) to the south; *Hilo-one* ("The sandy shoreline zone of Hilo Bay"); and *Hilo-pali-kū* ("Hilo of the upright cliffs," which extended from the Hāmākua side of the Wailuku River north to Kaʻula Gulch). The Hilo Bayfront Trails project encompasses several *ahupuaʻa* (native land divisions) that lie within all three of these areas. To the west, the project area includes the *ahupuaʻa* of Piʻihonua (bordered by the Wailuku River); it includes the adjacent *ahupuaʻa* of Punahoa, and then continues through Pōnāhawai, Kūkūau, and Waiākea along with the *ʻili kupono* of Piʻopiʻo.

The names of the legendary rulers of the area are identified with the place names for several land units (both the *ahupuaʻa* and their component *ʻili*) that make up Hilo. Many of these names survive today, but only as localities or street names; their cultural and contextual meanings are rarely if ever conveyed. These include, but are not limited to, Waiākea, Panaʻewa, Piʻihonua, Haili, Kalepolepo, Kāwili, ʻOhele, ʻŪpēloa, Kaūmana, and Hilo-Hanakāhi.

Legendary sources indicate that Hilo was, among other things, renown for its rain and fertility, and that its inhabitants were expert in *hula*, fighting, and other traditional competitions including running, fishing, debating, and solving riddles. Walking the ancient trails of legendary times, travelers often encountered obstacles they had to overcome through both ingenuity and competition.

One such legendary tale, *Kaʻao Hoʻoniua Puʻuwai no Ka-Miki* (Heart Stirring Story of Ka-Miki), was published in a series of articles between 1914 and 1917 in Hilo's Hawaiian language newspaper *Ka Hōkū o Hawaiʻi*. The Hawaiian text of these newspaper articles was translated by Kepā Maly (1992-93); and one passage of this story about two supernatural brothers, Ka-Miki (the adept one) and Maka-ʻiole (Rat eyes) who circumnavigated Hawaiʻi Island on foot along the *ala loa* and *ala hele* (trails and paths) in the 1300s, relates the competitive nature of the Hilo chiefs as well as associates legendary characters with specific places. The names of many of these characters are preserved today in the many place names of Hilo.

> . . . Ka-Miki, Maka-ʻiole and their companion Keahialaka departed from the compound of Kapuʻeuhi (in ʻŌlaʻa) and descended the *ala loa* towards Hilo to continue their journey. The travelers arrived at a large compound and community, where they saw a man coming towards them with a club. This man was Kūkulu-a-hāne-pū (Kūkulu). Kūkulu was a guardian of the chiefess and lands called Panaʻewa-nui-moku-lehua (Great Panaʻewa of the *lehua* forest). Panaʻewa was a sacred chiefess of Hilo, the sister of the chiefs Waiākea and Piʻihonua.
>
> The chiefess' compound and surrounding community were forbidden to strangers, and Kūkulu regularly killed unaware travelers (thus the name "Unjust" place). Kūkulu challenged Ka-Miki *mā* but he was quickly defeated, and Ka-Miki left him there as an example to other *ʻōlohe* and to receive his due justice. Ka-iki *mā* then continued their journey into Hilo, seeking out ʻŪpēloa, uʻu-aho-hilo-loa, and Haili-kula-manu.
>
> The lands of Waiākea were named for the high chief Waiākea-nui-kumuhonua, the brother of Piʻihonua-a-ka-lani (k) and Panaʻewa-nui-moku-lehua (w). After departing from Panaʻewa, Ka-Miki *mā* met Haili-kula-manu, who was a guardian of Waiākea. Haili led Ka-Miki and his companions to his chief's compound at Kalepolepo. Arrangements were made for Ka-Miki to compete with the *ʻōlohe* – experts of Waiākea, with the event to be held at the *kahua* (contest site) at Kalepolepo. ʻŪpēloa the champion – land administrator and war councilor of Waiākea, and an expert fighter with *ʻOkaʻa a lāʻau* (war clubs) was called to Kalepolepo.
>
> The *kūkini* Kuʻu-aho-hilo-loa went throughout the region announcing that contests would be held at Kalepolepo, and in a short time the entire area was filled with people, all wondering who would attempt competing against ʻŪpēloa. Ka-Miki *mā* were then called to the arena, thus Ka-Miki—who is the image of the war club of Ka-uluhe-nui-hihi-kolo-i-uka—entered the *kahua* and the contest rules were set. It was agreed that the method of

competition would be *‘ōka‘a lā‘au* [war club fighting], and that the loser would be killed and baked in an *imu*.

‘Ūpēloa exited the *hālau mokomoko* (contestants long house) with great agility and speed, and the crowd cried out with excitement at his ability. ‘Ūpēloa also held his finely worked club which was called *‘Ohi-ka-lau-o-ke-pāhili*, the club was also called *Ka-piko-o- Wākea*. ‘Ūpeloa was so strong, that no competitors had ever stood up to him. As ‘Ūpēloa and Ka-Miki stood on the *kahua*, readying to fight—Pi‘ikea, the spear fighting expert of the chief Nā-mau‘u-a-Pā‘ao asked, “O youth where is your club that you may stand against the spear fighting warrior of the chief Waiākea-nui-kumuhonua?”

Ka-Miki answered, “I have no club, my only weapon is my hands, but I have learned to use the war club from my club fighting teacher, I have used green *hau* spears, stripped like the *maile* (*Alyxia olivaeformis*), I have used clubs made of the *uhiuhi* (*Mezoneuron kauaiensis*) and the *koai‘e* (*Acacia koaia*), the resonant clubs made of the resilient kauila (Alphitonia ponderosa) trees which grow at Pu‘ukapele (Kaua‘i); my expertise covers all manner of war club fighting . . . and protecting myself from the top of my head to the bottoms of my feet.”

‘Ūpēloa then told Ka-Miki, “If you could truly escape from my club, your knowledge would be great, beyond compare. But coming here with this boasting, you are full of deceit and impertinence like no other, and you will not be spared from my club.”

Pi‘ikea then went to the edge of the *kahua*, and asked ‘Ūpēloa to wait a short time before fighting so that he go get his club for Ka-Miki to use. ‘Ōpēloa responded, “No! You are not his teacher, you are not the alternate for this errant youth, that you should give him your club. He says that his hands and fingers are adequate. Unless you wish to be his *moepu‘u* (death companion) you will stop this waste of time. Pi‘ikea if you are stubborn about it you and this youth shall both be the pigs which quench the fires of the *imu* today.” Ka-Miki called to Pi‘ikea, “I greatly appreciate your consideration, but it has been taken as a waste of time. With that, ‘Ūpēloa leapt to attack Ka-Miki in the manner of *Ka-piko-o-Wākea*, thinking that he would strike Ka-Miki with the blow. Ka-Miki leapt over ‘Ūpēloa and struck his hand. Because of the force of this blow, ‘Ūpēloa lost his club and it flew to Maka-‘iole who caught the club and held it.

‘Ūpēloa moved to attack Maka-‘iole, but Ka-Miki leapt in front of ‘Ūpēloa and commanded him to back off and maintain the requirements of the contest. ‘Ūpēloa did not heed the command because he was so outraged, and he reached to grab Ka-Miki, thinking to break him into little pieces. Ka-Miki then stepped behind ‘Ūpēloa and grabbed him by the thighs. He then picked ‘Ūpēloa up and threw him from the arena before Maka-‘iole and Keahialaka. Keahialaka then grabbed ‘Ūpēloa and bound him. Ka-Miki then called out to ‘Ūpēloa with a place name saying that commemorates his name to this day:

> *Ka manu o Kaupe ‘a ke ‘ope ‘ope ala i ka u/u hala o ‘Ūpēloa e* - The bird of Kaupe‘a (‘Ūpeloa himself) is all bundled up like the pandanus which grows at grows at ‘Ūpēloa.

Waiākea heard that ‘Ūpēloa had been defeated and was greatly surprised that his war counselor and war club fighting expert had fallen. Waiākea then called to his messenger Kapunakō to go get Kaūmana the foremost teacher of *lua, ha ‘iha‘i, kākā la‘au* (bone breaking fighting, and spear fighting), and all manner of fighting and bring him to the *kahua*. Upon arriving before his chief, Kaūmana asked Waiākea to send his messenger Kapunakō, to bring Kalanakāma‘a, Kaūmana's foremost student to join him at the *kahua* of Kalepolepo.

(The land of) Kalanakāma‘a was named for Kalana-kāma‘a-o-uli, the foremost *‘olohe* student of Kaūmana, and champion of Waiākea. Kalanakāma‘a was the ward of Kīpuka‘āhina (k), Hale-aloha (w) and Hale-loulou (k)], who dwelt above Hilo at Kipuka‘āhina.

When Kapunakō arrived before Kīpukaʻāhina, he spoke about the great rains and rivers of Hilo; a poetic reference to the many skilled which Hilo was famed. It was in this way that Kapunakō described the overwhelming skills of Ka-Miki and his victory over ʻŪpēloa. Kīpukaʻāhina then asked—*ʻōlelo noʻeau:*

Māmā Hilo i ka wai? - Is Hilo (without) lightened of its water?

Kapunakō responded—*ʻAe māmā Hilo i ka waiʻole, ua-kau i ka lani lea holo (wa 'a) ua o Hilo, na ka Mālualua e kiʻi ala; pulu ka liko o ka lehua a me ka māmane*!—Indeed one can move swiftly through *Hilo,* for the streams are without water, the water trough (i.e., the clouds) of Hilo are set in the heavens, it is the *Mālualua* which fetches moisture for the budding *lehua* and *māmane.*

Kīpukaʻāhina then asked in amazement—*Nawai e nele o Hilo i ka wai? He lau ka puʻu, mano ka ihona, he kini nā kahawai o Hllo, e ʻau i ka wai o Hilo a pau ke aho*! - Who could possibly make Hilo destitute of water? There are 400 hills, 4,000 places to descend, and 40,000 streams to cross, indeed one is worn out swimming through the waters of Hilo!

It was in this way that Kīpukaʻāhina learned that a master *ʻolohe* had come to Hilo challenging it's many *ʻolohe.* Using his *ipu hōkiokio* (gourd nose flute), Kīpukaʻāhina awakened Kalanakāmaʻa, for this was the only way in which Kalanakāmaʻa could be safely awakened, or he would kill who ever awakened him.

Kalanakāmaʻa joined his teacher Kaūmana, and met with the assembly at Kalepolepo. Carrying his club *Pūpū-kani-oe-i-ka-ua-o-Hilo* (Land snail singing in the rain of Hilo), Kalanakāmaʻa entered the *kahua* with Kaūmana and a great cry arose praising the abilities of these Hilo champions. Ka-Miki and Kalanakāmaʻa exchanged taunts, Ka-Miki stated that Kalanakāmaʻa would become the *kāmaʻa lau-ʻi i hili kaunaka ʻia* (twined ti leaf sandals) which Ka-Miki wears upon his feet. Outraged, Kalanakāmaʻa leapt to attack Ka-Miki with his club *Pūpū-kani-oe-i-ka-ua-o-Hilo,* Ka-Miki leapt out of the way, and took ʻŌpēloa's club from Maka-ʻiole. Seeing his student miss, Kaūmana called out to Kalanakāmaʻa telling him how to strike Ka-Miki – *ʻolelo noʻeau:*

> *Kau i ka lani ka holoua o Hilo, hilo ʻia i ke aho a ka ua he ʻIo ka hauna lāʻau e kiʻi ai, aʻohe wahi pāʻole, pā ma ke poʻo a hōʻea i nā wāwae, pā no pau ka ʻoni, ʻoni no he aīwaiwa ia, he hialōloa no ka naele, alaila hoʻi hou ka hauna laʻau a ke koa kua makani.*—Placed in the heavens is the water trough of Hilo, entwined in the cordage of the rains, *ʻIo* (Hawk) is the war club strike to use, for there is no place that can't be hit. Strike at the head and reach to the feet, for once struck, there will be no movement. If there is any movement, he is indeed a skilled expert of the depths (deepest knowledge), then return and strike again in the manner of the wind swept koa tree.

Ka-Miki then attacked Kalanakāmaʻa and quickly over came him, Kaūmana then leapt to the *kahua* and was beaten as well. After Ka-Miki defeated Kaūmana, word spread throughout the region, and Piʻihonua, Waiākea's brother called his council together wondering how they might help regain the honor of Hilo from this stranger.

Hanakāhi told Piʻihonua that it would be best not to fight, Piʻihonua then said that perhaps it had been a mistake to honor Hanakāhi with his title as champion, and marriage to ʻOhele. Hanakāhi told Piʻihonua all of the things that *Nā-Mauʻu-a-Pāʻao* had told Piʻikea about Ka-Miki, and said it would be unwise to compete, and thus leave all of the champions of Hilo in disgrace.

Hanakāhi himself was a master *ʻōlohe* trained by Maulua of Hilo-Palikū, he was skilled in *kākālāʻau* (spear fencing), *pololū* (long spear fighting), *ihe laumeki* (barbed spear fighting), and all manner of knowledge. Hanakāhi told his chief, "It is my desire to go before them (Ka-Miki *mā),* not in the manner of a competitor, but in the spirit of

> friendship, and to learn from them the things which they have been taught by their teachers. If I succeed, I will be the foremost *‘ōlohe* of all Hilo, and I will serve as their guide as they journey from one border of Hilo to the next border of Hilo.” Hanakāhi then asked his chief, “Do you agree?” Pi‘ihonua told Hanakāhi to go and compete first, then if he was securely bound to surrender and ask for friendship.
>
> Hanakāhi approached Kalepolepo, and the contest between Ka-Miki and himself was announced. *‘Ōka‘a .lā‘au* (club-spear fighting) was selected as the method of fighting, and when Hanakāhi asked Ka-Miki, “How shall the victory be determined?” Ka-Miki said, “By the breaking of one’s spear.”
>
> Ka-Miki greatly admired the nature of Hilo-Hanakāhi, and as they competed, Ka-Miki dodged each of the thrusts. To those gathered at the *kahua*, it was as if Ka-Miki was the teacher and Hilo-Hanakāhi was the student. Hilo-Hanakāhi tried each technique he had learned from his teacher, but was unable to score against Ka-Miki. Worn out, Hilo-Hanakāhi collapsed and was taken off of the *kahua*, borne in a net. Hilo-Hanakāhi acknowledged the nature and skills of Ka-Miki and surrendered to him, thus *ke ‘ahi kananā* (the fierce tuna fish) of Hilo befriended Ka-Miki *mā* upon the *kahua*.
>
> Hilo-Hanakahi returned to the chief Pi‘ihonua and they spoke of the events which had taken place at Kalepolepo. Pi‘ihonua then sent his messenger to invite Ka-Miki *mā* to his compound in the manner of *aikāne* (companions). Ka-Miki *mā* were well hosted by Pi‘ihonua, and Ka-Miki asked Hilo-Hanakāhi to accompany them to the border of Hilo and Hāmākua at Ka‘ula. Thus Hilo-Hanakāhi traveled with Ka-Miki *mā* through out the rest of Hilo. (Maly 1996a:11-14)

The earliest historical knowledge of Hilo comes from the writings of Kamakau (1961) of a 16th century chief ‘Umi-a-Liloa (son of Liloa) who at that time ruled the entire island of Hawai‘i. Descendants of ‘Umi and his sister-wife were referred to as “Kona” chiefs, controlling Ka‘ū, Kona, and Kohala, while descendants of ‘Umi and his Maui wife were “Hilo” chiefs, controlling Hāmākua, Hilo, and Puna (Kelly et al. 1981). According to Kamakau (1961) both sides fought over control of the island, desiring access to resources such as feathers, *māmaki* tapa, and canoes on the Hilo side; and *wauke* tapa, and warm lands and waters on the Kona side (c.f. Kelly et al. 1981).

Sometime near the end of the 16th century or early in the 17th century, the lands of Hilo were divided into *ahupua‘a* that today retain their original names (Kelly et al. 1981). These include the *ahupua‘a* of Pu‘u‘eo, Pi‘ihonua, Punahoa, Pōnohawai, Kūkūau and Waiākea (Figure 4). The design of these land divisions was that residents could have access to all that they needed to live, with ocean resources at the coast, and agricultural and forest resources in the interior. However, only Pi‘ihonua and Waiākea provided access to the full range of resources stretching from the sea up to 6,000 feet along the slopes of Mauna Kea (Kelly et al. 1981).

Historical accounts (McEldowney 1979) indicate that much of Hilo area was in a zone of agricultural productivity. As Isabella Bird recorded upon arriving in Hilo in 1873:

> Above Hilo, broad lands sweeping up cloudwards, with their sugar cane, *kalo*, melons, pine-apples, and banana groves suggest the boundless liberality of Nature. (Bird 1964:38)

Handy et al. (1991) also describe the region as an agricultural area:

> On the lava strewn plain of Waiakea and on the slopes between Waiakea and Wailuku River, dry taro was formerly planted wherever there was enough soil. There were forest plantations in Panaewa and in all the lower fern-forest zone above Hilo town along the course of the Wailuku River. (Handy et al. 1991:539)

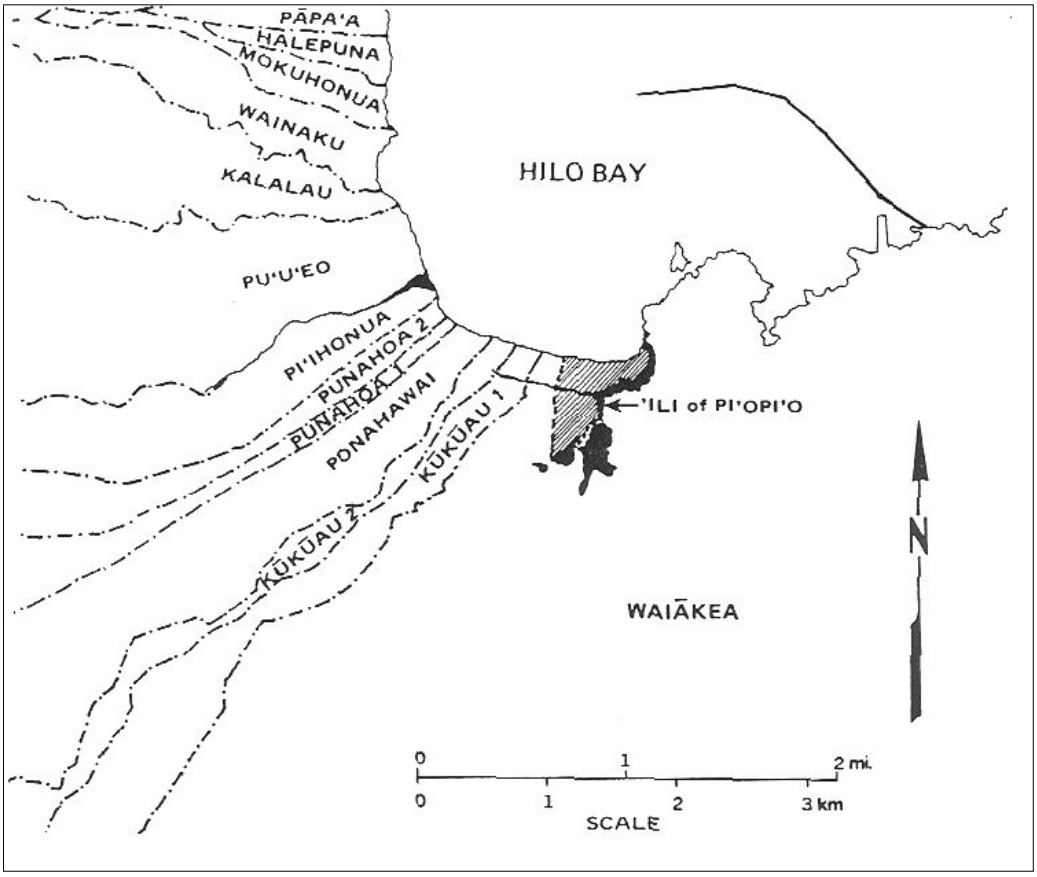

Figure 4. Hilo Bay showing *ahupua‘a* (from Kelly et al. 1981).

Maly (1996b) refers to a 1922 article from the Hawaiian Language newspaper, *Ka Nupepa Kū‘oku‘a*, where planting on *pāhoehoe* lava flats is described:

> There are *pahoehoe* lava beds walled in by the ancestors in which sweet potatoes and sugar cane were planted and they are still growing today. Not only one or two but several times forty (*mau ka‘au*) of them. The house sites are still there, not one or two but several times four hundred in the woods of the Panaewa. Our indigenous bananas are growing wild, these were planted by the hands of our ancestors. (Maly 1996b:A-2)

Hilo was one of the larger population centers on the Island of Hawai‘i, and also an area frequented by the *ali‘i* (Moniz n.d.). Captain George Vancouver, an early European explorer who met with Kamehameha I at Hilo Bay in 1794, recorded that Kamehameha was there preparing for his invasion of the neighbor islands, and that Hilo was an important center because his canoes were being built there (Moniz n.d.:7). Desha wrote that “It is thought that there were as many as seven *mano* [twenty eight thousand] people who gathered at the shore at Kaipalaoa when the *ali‘i* landed in their regal garments.” (2000:369). The people of Hilo had long prepared for Kamehameha’s arrival and collected a large number of hogs and a variety of plant foods, to feed the ruler and his retinue. Kelly et al. (1981) surmise that the people of Hilo had actually prepared for a year prior to Kamehameha’s visit and expanded their fields into the open lands behind Hilo to accommodate the increased number of people that would be present. Kelly et al. (1981) also speculate that many of the fishponds in Waiākea were created to feed Kamehameha, his chiefs, and craftsmen. The area at Hilo Bay that housed Kamehameha’s canoe fleets continues to be the site of canoeing, both recreational and competitive.

From at least Kamehameha I's time (late 1700s-early 1800s) a trail ran from above the cliffs of Hāmākua to, and along the shore of Hilo Bay. It was the main road of the time, the *ala loa* that linked communities. Early written accounts (see McEldowney 1979) describe an unwooded "plain" above Hilo extending to about 1,500 feet, or the forest line. Such accounts describe an open parkland with occasional, widely spaced homes, neat gardens and small clusters of trees. The same plantings as at the coast continued upland, with the addition of greater amounts of dryland *kalo* and bananas. Kipikipi (irrigated *kalo* fields) and fishponds sat along the Waiōlama and Wailoa streams near coastal homes, and between Waiākea Pond and the Panaewa forest stood stands of *kukui*, *hala* and mountain apple (Cordy 2000).

In the 1800s, there were numerous and rapid changes in the Hilo Bay area. In its first two decades, sandalwood was being cut and then shipped from Hilo Bay. In the 1820s-30s and beyond, missionaries arrived and settled. By at least 1824, whaling ships were arriving at Hilo Bay. Whaling captains stopped at Hilo for supplies and at times even left their wives in Hilo until they returned. The missionary William Ellis estimated that in 1823 about 2000 people lived in 400 houses or huts along the coastline at Hilo Bay. He described settings of native houses and garden plots interspersed with shady groves of trees – mostly *ulu* and coconut. Gardens were primarily planted with dryland *kalo*, as well as sweet potato and minor vegetable crops, and were bordered by windbreaks or small plantations of banana, sugarcane and *wauke*. Other traditionally cultivated crops noted as growing near the coastline include wetland *kalo*, *kukui*, *hala* and *ki* (Ellis 1963:229). Missionary presence in Hilo increased, and in 1836, David and Sarah Lyman established the Missionary Hilo Boarding School on Haili Street in Punahoa Ahupuaʻa.

In 1848, a measles epidemic began in Hilo and spread throughout Hawaiʻi Island. This was followed by a smallpox epidemic in 1853. These led to a significant demise in the native population and the consolidation of the dispersed settlements along Hilo Bay into a village area of predominantly wooden structures along the northern half of the bay. The main pier near the mouth of the Wailuku River (at the bottom of Waiānuenue Ave) was built in about 1863 and became a focal point for this community's trade and commerce. During this time Hilo Bay was ranked as the third most frequented port for whaling vessels in need of repair and re-provisioning.

By 1870, three *heiau* in Hilo – Kaipalaoa, Kanowa/Kanoa, and Honokawailani – were described as already being "ruins" (Kamakau 1992:145). Lydgate describes the Hilo bay front area as it looked in 1873:

> The sea at that time came right up to the bank edge of Front street, so that in heavy weather the spray blew more or less up into the street. Along Front street tall coconut trees of great age towered up over the street. From the foot of Church street extending along the beach it was open country, with the exception of one Hawaiian home, one canoe-builder's workshop – or halau, as it is called by the Hawaiians – and a tumbled down little blacksmith shop some distance farther on. (Lydgate 1922:102)

By 1874, Hilo ranked as the second largest population center in the islands, and within a few years shortly thereafter Hilo with its fertile uplands, plentiful water supply, and good port became a major center for sugarcane production and export. With its foundations in the Missionary Hilo Boarding School, commercial sugarcane cultivation and sugar production became the central economic focus for the Hilo area lasting until the 1970s. The Waiākea Mill Company, in operation between 1879 and 1948, with thousands of acres of cultivated fields, established its mill operation at Wailoa Pond in Waiākea Ahupuaʻa. The importation of contract labor from China in 1852, from Portugal in 1878, and from Japan in 1885 led to the formation of Hilo's multi-ethnic character.

With the introduction of electricity in 1895, the annexation of Hawaiʻi to the United States in 1898, and the granting of territory status in 1900, Hilo was designated the center of county government in 1905 and continued to be the second most populated city in the newly formed Territory of Hawaiʻi. Sugar continued to be the island's big industry and Hilo was an important shipping hub. Improvements to Hilo Bay as a protected anchorage and Harbor began in 1908 with the construction of the Hilo breakwater (Figure 5), which was completed in 1929. Railroad lines (first built in 1899) carried the sugar to the harbor, where the first Kūhiō Wharf pier was built between 1912 and 1916. A second was built in 1923 **(**Lang 2007:17). Sugar cultivation brought dramatic changes to the Hilo area. Some of its large fishponds (Hanalei, Kalepolepo, Mohouli, Waiāhole, and Hoakumau) were filled and thus destroyed. Many old residences, burial sites, trails, *heiau*, and more were destroyed by the development of sugar plantation fields.

Figure 5. Hilo breakwater shortly after it was completed in 1929 (from Lang 2007:98).

An April 1, 1946 *tsunami*, caused by a major earthquake off the Aleutian Islands, hit Hilo Bay and had a devastating impact on lives, residences and business along the coastline. It demolished much of the railroad tracks (which had been destroyed by *tsunami* before, in 1923, and rebuilt), as well as the railroad station. This time however, the railway was not rebuilt. As a result, Hawaii Consolidated Railway went out of business and a new motor vehicle transportation route was built on top of some of the existing rail bed extending to the Hāmākua Coast (Lang 2007:23).

Hilo sampans provided public transportation in Hilo. They were colorful, open-sided jitneys that were usually family-owned, and operated as inexpensive transport for more than 50 years. The last went out of service in the mid-1970s (Lang 2002:2).

What follows below is a discussion of the specific historical and cultural characteristics of each of the project area's *ahupua‘a* from west to east.

Pi‘ihonua

At the western end of the study area, Pi‘ihonua is bordered to the west by the sometimes-raging Wailuku River, which translates to "Water of Destruction" and which, before the time of modern bridges, presented a rather formidable barrier between the people of the Hilo Bay area and their neighbors to the north.

In 1823, when the Missionary William Ellis circumnavigated the island, he described the markets that had until recently been held along the Wailuku River, which were traded at by people from as far away as Puna and Ka‘u. Ellis noted that the markets ended when Liholiho came to rule in 1819.

> Makoa and the natives pointed out a square rock in the middle of the stream, on which, during the reign of Tamehameha, and former kings, a toll used to be paid by every traveller who passed over the river.
>
> Whenever any one approached the stream, he stood on the brink, and called to the collector of the toll, who resided on the opposite side. He came down with a broad piece of board, which he placed on the rock above mentioned. Those who wished to cross met him there, and deposited on the board whatever articles had been brought; and if satisfactory, the person was allowed to pass the river. It did not appear that any uniform toll was required; the amount, or value, being generally left to the collector.

> The natives said it was principally regulated by the rank of number of those who passed over.
>
> In order the better to accommodate passengers, all kinds of permanently valuable articles were received. Some paid in native tapa and mats, or baskets, others paid a hog, a dog, some fowls, a roll of tobacco, or a quantity of dried salt fish. (Ellis 1963:229)

D.H. Hitchcock described the dangers of crossing the Wailuku River when traveling north from Hilo along the "Laupahoehoe Trail," which followed the line of Jail Street [today Kinoʻole Street] and led down into the riverbed.

> Here the stream rushes, when in ordinary water, through two narrow channels and then leaps over a fall of ten to fifteen feet. Across these were laid foot wide planks on which pedestrians could cross on foot. Horses had to swim across some distance above and their trappings were carried across the planks, or as was sometimes the case, taken down to near the mouth of the river and there swum across to the Puueo shore. The crossing on foot wide planks, with the rushing waters beneath tearing through these narrow channels, was very precarious, and especially so when the planks were muddy and slippery. Some lives had been lost by the slipping of travelers from the planks. Once in the stream, which ran with the velocity of a millrace, life was gone. (Hitchcock 1897, cited in Lang 2007:85)

The river's first suspension bridge was built in 1866 and collapsed less than two months later. A number of people on horseback, including *Two Years Under the Mast* author Richard Dana, were crossing at the time and were "fished out" by Hawaiians (Lang 2007:20).

Pinao Heiau stood at the west corner of Ululani Street and Waiānuenue Avenue in Piʻihonua, though no trace of it remains (Stokes and Dye 1991). Kaipalaoa Heiau, another *heiau* no longer in existence, is thought to have stood just west of Isabelle Point (the old name for that point was Kaipalaoa) (ibid).

The historically and culturally significant Pinao and Naha stones, now stand in front of the Hilo Library on Waiānuenue Avenue. The Pinao stone is said to be from the former Pinao Heiau, and the Naha stone is, according to tradition, the one Kamehameha lifted after it was prophesied that the chief who lifted that enormous stone would rule all the islands (Lang 2007:110).

While Kamehameha I was fighting at Nuʻuanu, the *kapu* chief Namakeha (a chief from Maui) made trouble at Hilo, and so in 1796, Kamehameha made war on Namakeha and his followers there. Namakeha was defeated and hid, but when found in January of 1797 he was reportedly sacrificed at Kaipalaoa Heiau (Kamakau 1961).

Piʻihonua was also the site of a story Kamakau tells of Kawau, a "hunchback" and lesser chief of olden times, who returned from fishing one day and saw the surf called Huia off Piʻihonua and Punahoa. According to Kamakau, Kawau chanted about the great waves from Kahiki and other far-off lands: "*Kū mai, kū mai, kū mai*" – "Arise, arise, arise." The chant then speaks of the Polynesian islands from where the waves come, and concludes, "*Hoehoe Pae; pae au la*." "I will paddle until I reach shore; I have landed" (Kamakau 1991:116-117).

Both whalers and missionaries, who overlapped in time, influenced the early culture of the Hilo area. Between 1863 and 1890, landing wharves were built at the foot of what is now Waiānuenue Avenue (in Piʻihonua Ahupuaʻa) to aid in the ocean transport of goods and passengers. D.H. Hitchcock built the first one with Sheriff Coney. Later, Hitchcock wrote that their "little wharf was a vast improvement on the old style of running the boats up onto the sand beach and transferring passengers and goods from them to dry land on the backs of the stalwart boat boys, stripped to their *malo*'" (Lang 2007:86).

Nineteenth-century Waiānuenue (in the latter part of the century, a dirt, horse-and-buggy road so named because it led to the "Wai Ānuenue" [Rainbow Falls]) had wide drainage ditches in front of its

homes, which, as today, were on both sides of the street. The ditches drained water to the ocean. (Lang 2007:26, 115). At its base, as today, Waiānuenue Avenue was a commercial area of shops including the Hilo Drug Company, which opened in 1896 at the corner of Kamehameha and Waiānuenue Avenue. In 1890, most of the homes above Pitman Street (now Kinoʻole St.) were still grass *hale* (Lang 2007:26, 31).

The railroad depot (also site of the town's first post office) stood near the *makai* end of Waiānuenue Avenue, across from the present Koehnen Building, between Waiānuenue Avenue and Shipman Street. The railroad transported both sugar and passengers from Hāmākua and Puna mills to Hilo harbor until it was destroyed by the 1946 tsunami. (Lang 2007:6). Before the 1946 tsunami, businesses lined both sides of Kamehameha Avenue. The *makai* row of buildings was not rebuilt (Lang 2007:44).

Punahoa

Punahoa literally translates as "companion spring" (Pukui et al. 1974:194), a moniker which no doubt relates to the many fresh water sources in the Hilo area. At the time of the *Māhele* of 1848 Punahoa was divided into 2 parts, Punahoa 1 and Punahoa 2. An archaeology study conducted by the Bishop Museum in the late 1970s (Sinoto 1978) identified old *ʻauwai*, terraces, rock mounds and modified stream beds within the inland portions of Punahoa 1. Maly (1996a:39) also suggests that "a small *heiau hoʻoūlu ʻai* (a temple at which ceremonies were offered to ensure successful harvests)," named Kiniakua and reference by both Thrum (1907) and Hudson (1932) to have been situated near the spring of Waikapu, was perhaps located in Punahoa.

Kamakau (1961:130) writes of the 1773 Hilo chief Keawe-hano, whose houses were "situated on the beach at Punahoa, close to Piʻihonua and facing the waves of Huia and Kihanui." Kamakau recounts that when a lesser chief named Ka-pohu went to Keawe-hano's house, he stood outside the fence and saw Keawe-hano and Ka-ʻakakai sitting "at the threshold of the house, both wearing feather capes on their shoulders, feather necklaces about their necks, and helmets on their heads" (ibid).

In the 1832, the Lyman missionary family settled in Punahoa in a wooden frame house, which still stands on what is now Haili Street as part of the Lyman Memorial Museum. Then in 1836, the missionary David Lyman and his wife Sarah opened the Hilo Boarding School, formerly located near the present day Hilo Boys and Girls Club on Haili Street. Their "goal was to educate Hawaiian boys in the ways of industry and morality, and to be a preparatory school for Lahainaluna High School on Maui (Lang 2007:57). As part of the curriculum, students cultivated various food crops and sugarcane, and ran a tailor shop, dairy, and blacksmith (ibid.). Perhaps one of the first vocational training schools in the United States territory, it operated until 1925.

As its name indicates, water was always a significant aspect of Punahoa, and the first ditch excavated in Hilo to carry fresh water from *mauka* to *makai*, is identified as having been ordered by a Hilo chief named ʻI, at a time well before that of Kamehameha I. This ditch ran "close to Puuhonu [one of the Hilo Hills], on the Pueo [Hamakua] side, and …went right straight down to the foot of Waianuenue Street" (Kelly 1982:10). Prior to this, residents generally got their water from the Wailuku River.

After Kamehameha I united the islands, he ordered a channel dug from the ʻI ditch, which started some distance above the old Hilo Hotel towards Waiānuenue Avenue and, along with the ʻI ditch, supplied water to the government buildings located between what is now Keawe and Kinoʻole Streets (Kelly 1982:10).

Another significant waterway was the ditch dug by the Hilo Boarding School to bring water from the Wailuku River to power an electric generator, which provided electricity for about a dozen lights in the study hall and in the principal's cottage. A little later, the school used that electricity to start an ice plant. In 1895, the Boarding School Ditch was generating commercial electricity to Hilo via the specially formed Hilo Light Co., Ltd., which began in 1895 (Kelly 1982:9).

Ponahawai

The name Ponahawai literally translates as "water circle" (Puku'i et al. 1974:189). A prominent landform within Ponahawai are the Hāla'i Hills (cinder cones formed during an older than 10,000 year Mauna Loa volcanic event). The three Hāla'i hills are called Hāla'i, 'Ōpe'ape'a and Pu'uhonu. In various traditional accounts, the Hāla'i Hills are associated with the demigod Maui and his goddess mother Hina; it is said that Hina, lived in a cave in the nearby Wailuku River beneath Rainbow Falls. Hina gave the Hāla'i Hills to her daughter Hina Ke Ahi (or Hina-i-ke-ahi). Hina is said to have saved her people during a drought by ordering them to dig an *imu* (earth oven), and then getting into the *imu* and lighting the fire:

> She then sank into the underworld and became a gushing stream. On the second day she emerged as a pool near the sea, and on the third day a spring burst forth. She washed herself and returned to the oven, ordering her people to open it. They found abundant food. (Kelly 1982:8)

Another significant landscape feature of Ponahawai was the Waiōlama marsh area just inland from the Hilo shoreline. This marsh area was also developed into a fishpond and was used for a unique type of Hawaiian cultivation (*kipi*), a practice whereby *kalo* was grown in mounded organic rafts that were floating in the marsh. The only other places in the Hawaiian Islands where this type of *kalo* cultivation was known to be practiced was at Hā'ena, Mana, and Wai'eli on Kaua'i (Handy et al. 1991:419). The *ali'i* Ruth Ke'elikolani had a house near the bay at Waiolama, and spent time there during her well-known 1880-81 visit to Pele, at which it was said she successfully stopped an advancing lava flow when it was less than 2 kilometers from Hilo Bay (Kelly et al. 1981).

In 1889, a small canal was dredged to divert some of the water from the Waiolama Marsh into the Wailoa River. The drainage canal was enlarged and paved between 1915 and 1917, and beach sand was pumped into the low-lying lands of the Waiolama, filling in the remains of the "taro beds" at Ponahawai (Kelly 1982).

Commercial sugarcane cultivation had begun in Ponahawai by at least 1839, under the direction of Governor Kuakini. In 1840-41, the mill produced about 30 tons of sugar. Near the lower end of the Alenaio Stream was the Hawaii Mill, built in the 1880s (Kelly et al. 1981).

Kūkūau

According to Pukui et al. (1974:121) Kūkūau is named for a type of shore crab. At the time of the *Māhele* of 1848, Kūkūkau was divided into Kūkūau 1 and Kūkūau 2, although the total size of the *ahupua'a* is small, similar to Ponohawai. One legendary account perhaps metaphorically describes the similarity between Ponahawai and Kūkūau:

> Kukuau and Ponahawai . . . were two girls who came rambling along till they reached Kalalau (the careless idler), the proper name of which is Pukihae (inspiration hill). Searching around they looked down into the stream and saw two girls bathing, and, remarking upon their comeliness, desired to descend and make friends with them. So they started down, but strange to say, on reaching the stream the bathing girls had disappeared. Diligent was the search, but to no purpose; they were not found. Therefore the place was called Kalalau and Wainaku (searched water), on account of the leading astray of Kukuau and Ponahawai in their fruitless search for the nymphs. Ala-pahee was the name of the pond in which the bathing girls were seen. (Thrum 1920:98)

Waiākea

Pukui et al. literally translate Waiākea as "broad waters" (1974:220). Maly (1996a:11) provides the following translation of a traditional account of the *ahupua'a* name:

> The lands of Waiākea were named for the high chief Waiākea-nui-kumuhonua, the brother of Pi'ihonua-a-ka-lani [k] and Pana'ewa-nui-moku-lehua [w]. (Maly 1996a:11)

Ethnographic notes taken by Theodore Kelsey during an interview with Mrs. Kamakakuikalani in 1921 record that "Waiākea was so named 'because you could dig any where and find water'" (Maly 1996a:6). Waiākea is a large *ahupuaʻa* that in former times was referred to as a "food container" due to its rich, extensive system of fishponds, good ocean fishing, and extensive dryland agricultural resources (Iʻi 1959:14). This large land area was divided into several smaller land units, or *ʻili*. The *ʻili* of Waiākea are Panaʻewa, Keaukaha, Pūʻāinakō, Kāwili, Kaleplepo, Piʻiopiʻi, Mohouli, and Kalanakāmaʻa.

In addition to Waiākea being a residential location for Hilo's *makaʻāinana*, the area has long been recognized as a place of chiefly residence. As early as the 16th century, the Hilo chief Kukukuluʻa lived at Waiākea (Kelly et al. 1981). And later, during the reign of Alapai, Iʻi recounts:

> Alapai, ruler of Hawaii [from c. 1730-1754] and great uncle of Kamehameha, and his wife Keaka took charge of him [Kamehameha]. Some years later, Alapai and his chiefs went to Waiolama in Hilo, where Keoua Kupuapaikalani, the father of Kamehameha, was taken sick and died. Before Keoua died he sent for Kalaniopuu, his older half brother and the chief of Kau, to come and see him. Keoua told Kalaniopuu that he would prosper through Kamehameha's great strength and asked him to take care of the youth, who would have no father to care for him. Keoua warned Kalaniopuu, saying, "Take heed, for Alapai has no regard for you or me, whom he has reared." After this conversation, Keoua allowed his brother to go, and Kalaniopuu left that night for Puaaloa [situated in the Panaʻewa portion of Waiākea].
>
> As Kalaniopuu neared Kalanakamaa [in Waiakea], he heard the death wails for Keoua and hastened on toward Kalepolepo [between Mohouli and Kawili] where he had left his warriors, There they were attacked by Alapai's men, who had followed Kalaniopuu from Hilo. First the warriors from the lowland gained, then those from the upland . . . Kalaniopuu continued his journey and at midnight reached Puaaloa, where he arranged for the coming battle. The next day all went as he had planned, his forward armies led the enemy into the forest of Paieie, where there was only a narrow trail, branchy on either side and full of undergrowth. There his men in ambush arose up against the enemy warriors, and his rear armies closed in behind them . . . When news reached Alapai that his warriors had been destroyed, he sent another company of warriors to meet Kalaniopuu at Mokaulele on the outer road, which was an ancient road, known from the time of remote antiquity. (I'i 1959:3-4)

Kamakau adds:

> . . . Keoua, called Ka-lani-kupu-a-pa-i-ka-lani-nui, fell ill of a lingering sickness at Piʻopiʻo adjoining Wailoa in Waiakea and died there in 1752 . . . His older brother Ka-lani-opuu was with his *kahu* Puna above Kalepolepo at the time. (Kamakau 1961:75)

Maly provides further confirmation of the relationship between Waiākea Ahupuaʻa and Hawaiʻi's *aliʻi nui*:

> In c. 1790, a dispute arose between Keawemauhili and his nephew Keōua, and Keōua attacked and killed Keawemauhili. Kamakau reports that Keōua divided the lands of Hilo District between his chiefs and warriors, and "the fat Mullet of Waiakea and Piʻopiʻo became theirs: (Kamakau 1969:152). In 1791, Keōua was killed and Kamehameha I retained Piʻihonua, Punahoa, and Waiākea as his personal land holdings in Hilo. Liholiho, or Kamehameha II was born in Hilo in 1797 (Kamakau 1961:260), and because of the value of Waiākea with its agricultural and fishpond resources, Liholiho retained Waiākea until his death in 1824. For a time, a granddaughter of Keawemauhili's, Kaunuohua, held waiākea, but in the Māhele, or Land Division of 1848, Kauikeaouli (Kamehameha III), assumed the rights to Waiākea (Indices of Awards 1929:26). Kauikeaouli retained Waiākea until his death in 1854, the *ahupuaʻa* was among the "Crown Lands" which under the monarchy, came to be held in perpetuity by the rulers of Hawaiʻi. (Maly 1996a:10)

In 1823, the missionary William Ellis described Waiākea as:

> …the most beautiful we have yet seen….The whole is covered with luxuriant vegetation, and the greater part of it formed into plantations, where plantains, bananas, sugar-cane, taro, potatoes, and melons, grow to the greatest perfection.
>
> Groves of cocoa-nut and breadfruit trees are seen in every direction loaded with fruit, or clothed with umbrageous foliage. The houses are mostly larger and better built than those of many districts through which we had passed. We thought the people generally industrious; for in several of the less fertile parts of the district we saw small pieces of lava thrown up in heaps, and potato vines growing very well in the midst of them, though we could scarcely perceive a particle of soil.
>
> There are plenty of ducks in the ponds and streams, at a short distance from the sea, and several large ponds or lakes literally swarm with fish, principally of the mullet kind. The fish in these ponds belong to the king and chiefs, and are tabued from the common people.
>
> Along the stone walls which partly encircle these ponds, we saw a number of small huts, where the persons reside who have the care of the fish, and are obliged frequently to feed them with a small kind of mussel, which they procure in the sands round the bay.
>
> …There are 400 houses in the bay, and probably not less than 2000 inhabitants…. (Ellis 1963:337-338)

‘Ohele Heiau, a *heiau luakini* (Malo 1951) measuring 60 feet square, stood near the Puna-side shoreline where the Wailoa River enters the ocean, approximately where Suisan Fish Market now stands. This was just above the site of the former Pitman store, and during Pitman’s time in Hilo (early- to mid-1800s) ‘Ohele Heiau was already in ruins (Stokes and Dye 1991).

The Kāwili area of Waiākea, bordering the University of Hawai‘i at Hilo, was previously native forest where birds were *kāwili* (ensnared). They were collected both as a food source and also for their feathers, which were used to make ornaments for royalty. An ethnographic text recorded by Kelsey in the early 1920s describes the traditional snaring and trapping of birds. The following was dictated by H. B. Nalimu (the great great great grandfather of Leslie Lang, coauthor of the current study) and transcribed by Kelsey, and more recently translated by Kepā Maly:

> **Snaring and Trapping Birds**
>
> Bird catchers (*kia manu*) of ‘Ōla‘a were people who snared (*‘ahele*) birds. Some with branches and others with *lehua* blossoms. The individual who snared birds among the *lehua* made a snare (lasso) close to the *lehua* flower, the snare was secured there. One end of the line was securely fastened on the branch of the *‘ōhi‘a*. The cord of perhaps five or six fathoms long, extended from the lasso (on the branch) to the man’s hand where the end of the line was held tightly. The snare was placed close to a *lehua* blossom, where the bird would step *(kīko‘o)* to the *lehua.* At that time, the man would then pull the end of the cordage and secure the feet of the bird. The man then climbed the tree, took the bird, and he would make the snare there again. The *‘akakane* (*‘apapane*)*;* the *‘i‘iwi*, and the *‘ō‘ō* were caught up in the *lehua*, snared with fine *olonā* cordage. The *‘ō‘ū* bird was snared while it was on the ripe banana fruit.

Preparing Bird Lime to *Kiiwili,* or Ensnare Birds. The bird lime *(kēpau)* is made from the sap of the breadfruit. Cut the breadfruit bark and the white sap flows, and when the sap is dry, say in the evening, the sap is hardened. You go and gather the sap. When enough has been gathered, the sap can be made into bird lime. Then you go and gather some raw *kukui,* removing the shell, you keep its meat. You then go and get the "clover" for making bird lime (*ʻihi-ku-kepau,* the *Nasturtium sarmentosum*), it is a black *pāʻihi,* and you mix it with the raw *kukui.* Then you chew it, and the *kukui* and *pāʻihi* become slimy. This is put into a *wauke* bark cloth (it is a tough piece); then the juice of the *kukui* and *pāʻihi* are squeezed into the *ʻopihi* (shell), it is the "pot" for cooking the broth over the fire. When it starts to boil, the *('ulu)* gum is cut into small pieces and put in the juice of the *kukui* and *pāʻihi* so it can boil. Then get two coconut mid-ribs or perhaps little sticks to stir this boiling juice. This is how it is done until the juice is cooked and becomes the birdlime. It is then place into the empty *ʻopihi* or a ti leaf, wrapped up in ti leaves. Kāwili is in the uplands adjoining Mokaulele. Then go to where there is low branching *ʻōhiʻa (pulu ʻōhiʻa),* where the *pāhoehoe* is below.

You are below on the *pāhoehoe,* and you apply the birdlime around the *lehua* flowers. Now you *kāwili* (twist, i.e. apply) this bird lime in among three or four *lehua* flowers, then when a bird is stuck by one of the *lehua* that blossoms, you free it and it is caught. You then hide again among the low *ʻōhiʻa* branches (a place where the *ʻōhiʻa* tops droop down, that is the *pulu ʻōhiʻa),* and catch another bird. You squeeze the birds head and it is killed. It is placed into a bag. Returning (home) perhaps around three ʻo clock, there are many birds, perhaps forty, twenty, or thirty. Those small birds; when fat----the meat is tasty and sweet. That's how one prepares *kāwili kēpau,* or bird lime to ensnare birds.

SNARING BIRDS ON BRANCHES. The (decoy) branch is perhaps three or four fathoms long. *Lehua* blossoms are placed on this branch, from one side of the branch up to the tip of the branch. Two men do this job, one at one (end of the) branch and one at the other. Bird lime is placed on top of the branch along with many *lehua* blossoms in between this bird lime----this is a bird catchers (*kia manu*) branch _____ [as drawn in manuscript]. ʻŌlaʻa and Piʻihonua are lands of bird catchers. There are many *ʻōʻō* birds at Puʻu ʻŌʻō. It is there that the bird catchers go to get the feathers for adornments (*lei*) of the chiefs. Panaʻewa is also a place of the bird catchers.

The bird catchers (decoy) branch is pulled in between the *ʻōhiʻa lehua* trees. One (person) uses the net. The net is pulled up, one branch is above, one branch is below. It is an open (wide) meshed *olonā* net *(ʻupena olonā maka hakahaka),* and *olonā* cordage at the tip. It is a soft (pliable) net perhaps five, four, or three fathoms long. As the birds fly their feet are caught, or their wings caught. Now if there are one or two birds, they are left, these are the birds that call out to the other birds. When there are many birds the net is let down (the birds taken), then the net is pulled up again. *ʻŌhiʻa* growth is all around. So this is the work of the "bird-fishers," or *lawaiʻa manu.* They return to the house and then remove the feathers of the *manu ʻōʻō.* When the container is filled with feathers, a *lei* is made. Below the wing-pit is where the male *ʻōʻō* bird feathers are, and above on the back by the tail, are the pale yellow feathers. (Maly 1996a:7-8)

Moku Ola (also known as "Coconut Island") means "Island of Health" and is said to have been named for an underwater rock believed to possess healing powers. Along with an area along the adjacent shoreline, Moku Ola was part of a large *heiau* complex that also included a *heiau luakini* and *puʻuhonua* (Lang 2007: 96). In the twentieth century, the Keliʻipio family acted as caretakers of the island. Before the much more recent concrete bridge was erected, they took people to the island by canoe for 5 cents. Some people, to avoid having to pay again, would swim back (Martha Lang 1995, personal communication).

Long ago a system of large, walled-off and spring-fed fishponds was built along the Wailoa River. Some of the fishponds were restricted for *aliʻi* use only, and others were for *makaʻāinana*. The delicious fish of the Waiākea fishpond are referred to in various early accounts, such as a story about when Kamehameha announced his intent to make war on Keawemauhili, who wanted to avoid war and sent Kamehameha the "sweet tasting ʻanae of Waiākea and the fat awa" in the center of the fishpond (Desha

2000:161). Caretakers had small huts alongside the fishponds, from where they guarded the fish from theft or being killed by pigs and dogs (Kamakau 1976:48). Waiākea's fishponds, said to be favorites of Hiʻiaka and Pele, also figured in a story about why the goddess Hiʻiakaikapoliopele caused the deadly ash fall that killed Keōua's army when they passed near the volcano. According to a seer at the time, "the goddess was angry at Keōua for not offering her some of the "fat mullet of Waiākea" (Desha 2000:279).

Between 1824 and 1848 Hilo became a significant center for foreign activities, primarily as a result of the establishment of religious mission stations by American missionaries. The first mission station was established at Waiākea within Piʻopiʻo along the outflow of the Wailoa River. In 1825 Queen Kaʻahumanu gave Punahoa 2 Ahupuaʻa to missionaries and the mission station was relocated. In 1836 and two New England style houses were constructed in the area; however, Native Hawaiian land use practices continued to dominate the Hilo Bay (Figures 6 and 7) area and the Piʻopiʻo portion of Waiākea remained a residential area for Hawaiian royalty.

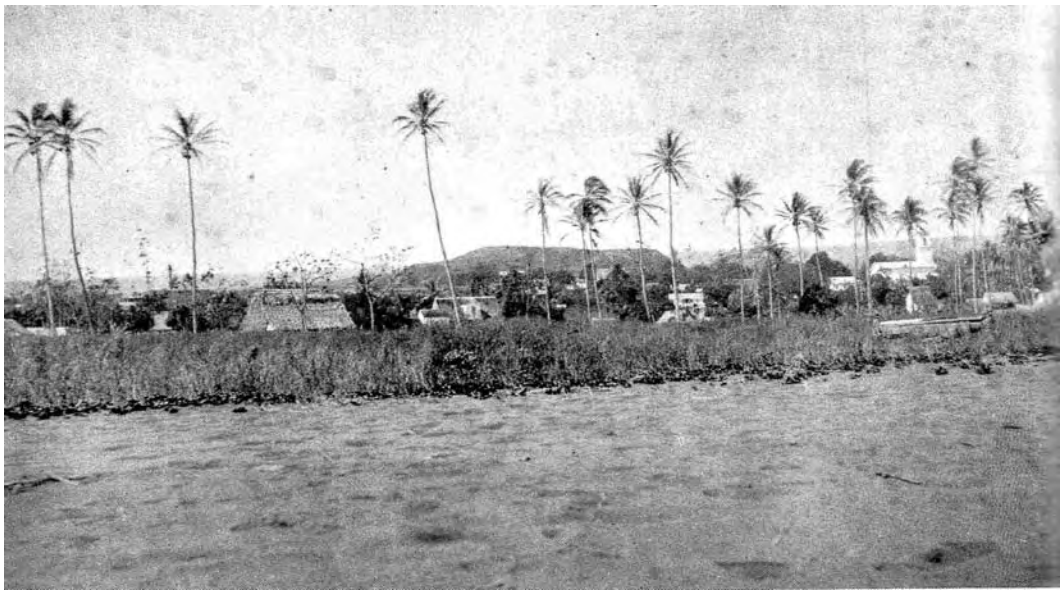

Figure 6. A view of the Hilo bay front during the middle nineteenth century (from Lang 2007:24).

Figure 7. A traditional house of the middle nineteenth century (from Lang 2007:100).

In 1879, the Waiākea Mill Company brought intense sugar cultivation to Waiākea. Its first sugar was planted in 1870 in Waiākea Uka and extended 1,100 feet up Mauna Loa. The Waiākea Mill Company started with about 350 acres of cultivated lands they had acquired from Lyman. In 1888 the company acquired a 30-year lease that increased their land holdings in Waiākea Ahupua‘a. When the lease ran out in 1918 the acreage under cultivation had increased to nearly 7,000; but without a lease the *ahupua‘a* fell under the homesteading laws, which required the government to lease the land to individual growers. Waiākea Mill Company was expected to grind the crop for the independent growers under a contract that gave the company 40% of the proceeds from the sale of the refined sugar. Contractual and legal problems combined with a declining sugar market and the devastating *tsunami* of 1946 led the Waiākea Mill Company to cease operation in 1947. During the 68 years of its operation, the Waiākea Mill Company was a major force in shaping the economic and social growth of Hilo, and certainly left its mark on both the cultural and physical landscapes of the area.

As depicted on a 1918 map (Figure 8), the company lands were divided into house lots, cane lots, and fields. The productive areas were interconnected with a plantation railroad system. The narrow gauge railway was laid out in a dendritic pattern with all lines ultimately feeding into a main line that terminated at the mill site and barge berth at the inland end of the Waiākea Fishpond (Figure 9). Refined sugar was placed on barges that carried the product via the Wailoa Stream to Hilo Bay, where it was loaded onto cargo vessels bound for the U.S. mainland. The Waiākea Sugar Plantation was unique in this fashion as it was one of only two plantations that used barges to haul sugar. A by-product of sugarcane production is bagasse, which the mills used as fuel for their boilers. As commercial fuel oils became increasingly available in the late 1920s, the use of bagasse as a fuel declined. This byproduct of production was then creatively used to manufacture a wallboard product for construction. In 1929, Hawaiian Cellulose Ltd, a subsidiary of the Waiākea Mill Company applied for a patent for this construction product, called canec. By 1932 Hawaiian Cellulose Ltd became known as Hawaiian Cane Products and opened a canec plant close to the site of the Waiākea Mill. Following a series of difficulties, not the least of which was the durability of the product, in 1948 Hawaiian Cane Products was bought out by the Flintkote Company of New York. With the application of stabilizing (toxic) chemicals, canec production flourished until 1960 when a factory fire devastated the operation.

Pineapple was another relatively short-lived commercial venture within Waiākea with plants cultivated in upland Waiākea and a pineapple cannery located where the Hilo Iron Works building now stands. The pineapple growers no doubt took advantage of the sugar plantation roadway and railway systems to get their produce to the cannery.

When Hawaii Consolidated Railway was in operation, its 3-stall wooden “roundhouse,” or locomotive garage, stood in Waiākea on Kalanikoa Street, next to what is now the County swimming pool. In 1920, the original structure was rebuilt as an eight-stall, reinforced concrete, quarter-circle “roundhouse,” though it retained the original turntable that reversed engines into their stalls (Figure 10). This roundhouse still exist, and *makai* of nearby Kuawa Street, the base of the flagpole that stood in front of the Hawaii Consolidated Railway office can still be seen (Lang 2007:12). During the sugar years, railroad tracks ran right into a shed for offloading freight at Kūhiō Wharf, on Pier 1 at Hilo Bay, and where were stored thousands of tons of sugar at a time (Figure 11; Lang 2007:17).

Figure 8. Waiākea Mill Company's 1918 map depicting company land divisions.

Figure 9. Waiākea Mill circa 1940 (from Lang 2007:19).

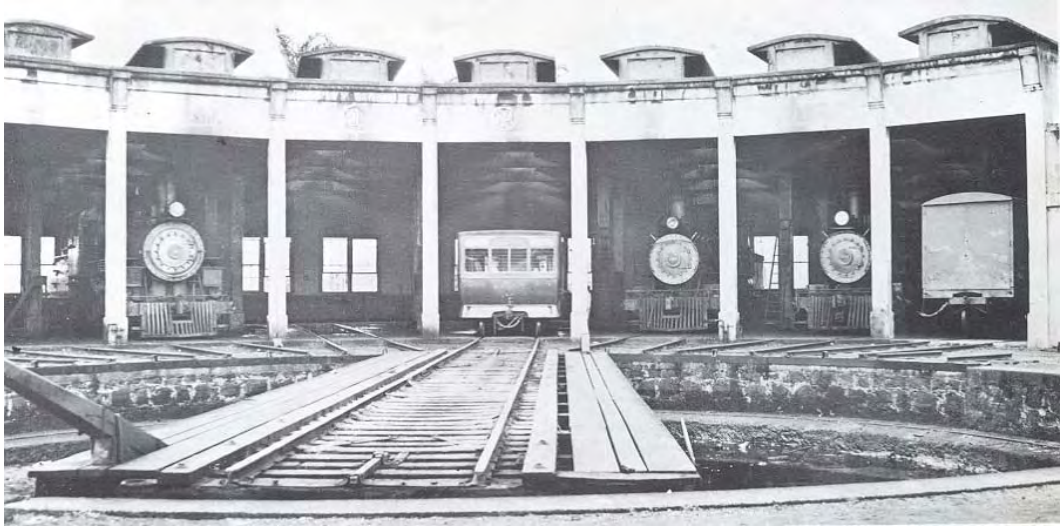

Figure 10. Waiākea turntable and round house in 1946 (from Best 1978:145).

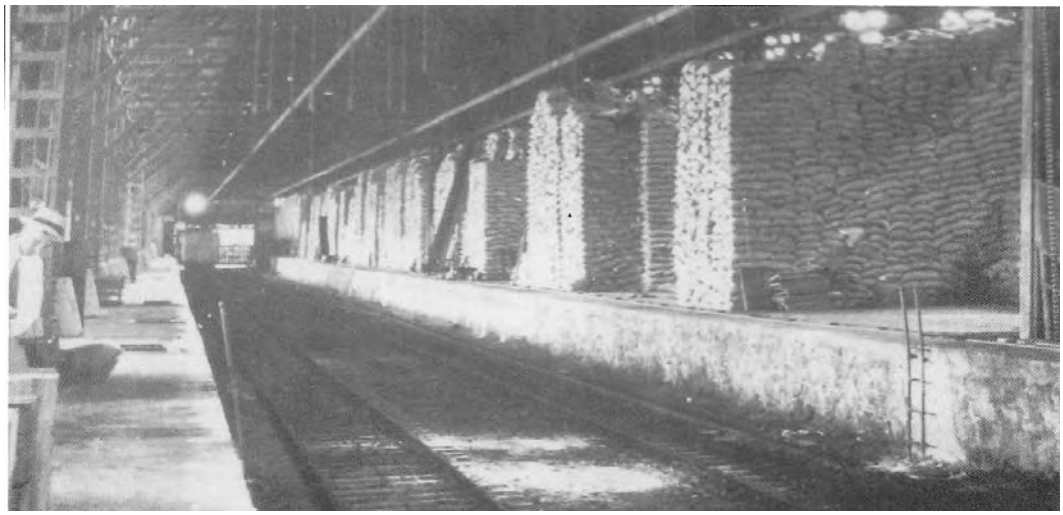

Figure 11. Kūhiō Wharf rail line and warehouse with stacked sacks of refined sugar (from Lang 2007:17).

In 1907, the Suisan Fish Market was built at its present Waiākea location. The company began by hauling fish into Hilo by horse-drawn buggy and selling it from open baskets. Over the years, it opened a *shoyu* and *miso* brewery and a jam/jelly plant, expanded into frozen foods, and began processing guava and other fruit purees. It was known for its long-lived fish auction, though it no longer operates (Lang 2007:32).

Banyan Drive on the Waiākea Peninsula was built in the early 1930s, and soon thereafter banyan trees were planted on both sides of the drive. According to Warshauer (2003, 2004), the first banyan tree was planted in 1933 and the last in 1972 by Mrs. Richard Nixon to replace one that was planted previously and later destroyed in 1952. It is along Banyan Drive that many of the larger hotels in Hilo were constructed.

Accomplished musician, singer and composer Helen Desha Beamer, who raised her family in Hilo, composed the song "Naniloa" for the grand opening of the original Naniloa Hotel built on Hilo Bay in Waiākea in 1940. She noted it was inspired by a dream:

> Naniloa, how majestic you are, Midst nature's green verdure, Bordered by the warm blue sea, Your stately rare *loulu*, Extend to all a welcome, To enjoy the sunshine, The Foundation of Life, *E ō, Naniloa* – Naniloa by the sea, *E ō, Naniloa* – Naniloa by the sea (Ka‘aihue 1991: 38).

Reed's Bay, in the Waiākea area called Keaukaha ("passing current"), was previously known as Kanakea ("wide stream"). A freshwater subterranean spring rises from a large sinkhole and feeds cold water into the bay at a former fishpond now known as the Ice Pond. Railway tracks crossed that pond from about 1916 until 1946, when they were destroyed by a *tsunami* (Figure 12); remnants of the railroad trestle are still visible within and above the surface of the pond (Figure 13).

A legend of Reed's Bay refers to a hole called Kaluakoko beneath the water. A man and a woman lived nearby, and later a second woman came to live with them. The new wife became jealous of the first, and convinced her to go net fishing one day when the husband was fishing, though the husband had forbidden it because it would affect his fishing. As she caught shrimp at the edge of a large hole, the second wife pushed her into the hole and covered the entrance with a rock, killing her. Blood spread through the sea foam and the fisherman, followed its trail in his canoe, moved the stone, and saw what had happened. He confronted the second wife, who lied, and then beat her to death. According to the story, the hole has been referred to as Kaluakoko (the Hole of Blood) (Wolforth 2004).

Pi‘opi‘o

Within Waiākea Ahupua‘a there is a small land division, or *‘ili*, called Pi‘opi‘o that is designated as an *‘ili kūpono*. An *‘ili kūpono* is described as being "a nearly independent *‘ili* division within an *ahupua‘a*, paying tribute to the ruling chief and not to the chief of the *ahupua‘a*" (Lucas 1995:41). Pi‘opi‘o has a long history of being a royal residence. Desha refers to Pi‘opi‘o as "a place of residence of chiefs from ancient times, and mentioned that Keawemauhili's wife Ululani lived there (Desha 2000:76). During Alapa‘inui's reign, Keōua (Kamehameha I's father) died at Pi‘opio, and later Keōua's brother, Kālanaiopu‘u also lived and died at Pi‘opi‘o (Fornander 1996:142, 201). Kamehameha I lived at Pi‘opi‘o after 1791, after which time the *‘ili kūpono* appears to have been given to Ka‘ahumanu. A residence for the Chiefess Ke‘elikolani is shown at Pi‘opi‘o on an 1891 map (Figure 14). Kamakau (1992:15) provides many references to *ali‘i* activities (e.g., *hula*, games of hiding stones (*papuhene)*, and tossing a half-coconut at a mark (*kilu*)) taking place at Pi‘opi‘o.

In about 1900, Shinmachi, which means "New Town" in Japanese, was established along the *mauka* side of Kamehameha Avenue, from Pi‘opi‘o Street to where the Hilo Iron Works building now stands. What had been low-lying swampland was filled with sand from Hilo Bay, and became a close-knit, primarily Japanese community until 1946, when many of its buildings were destroyed by a *tsunami* and more than 100 people died. It was not rebuilt and the area has today become grassy parkland (Lang 2007:36).

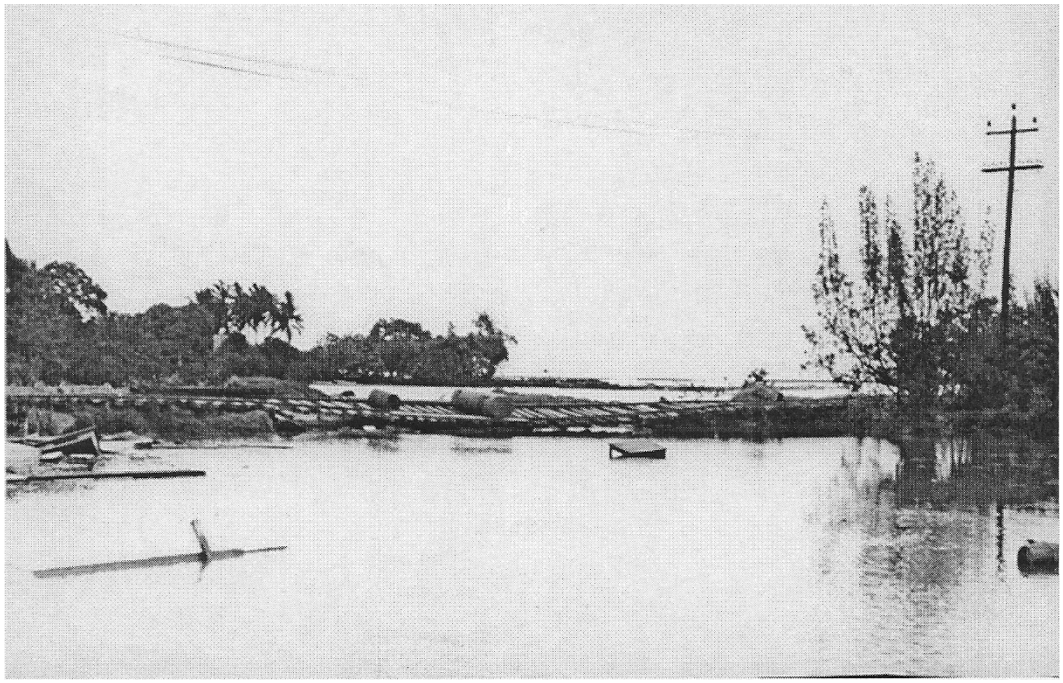

Figure 12. Railway tracks across Kanakea Pond following their destruction by the 1946 *tsunami* (From Wolforth 2004:24).

Figure 13. Modern day remnants of the railroad trestle within the “Ice Pond.”

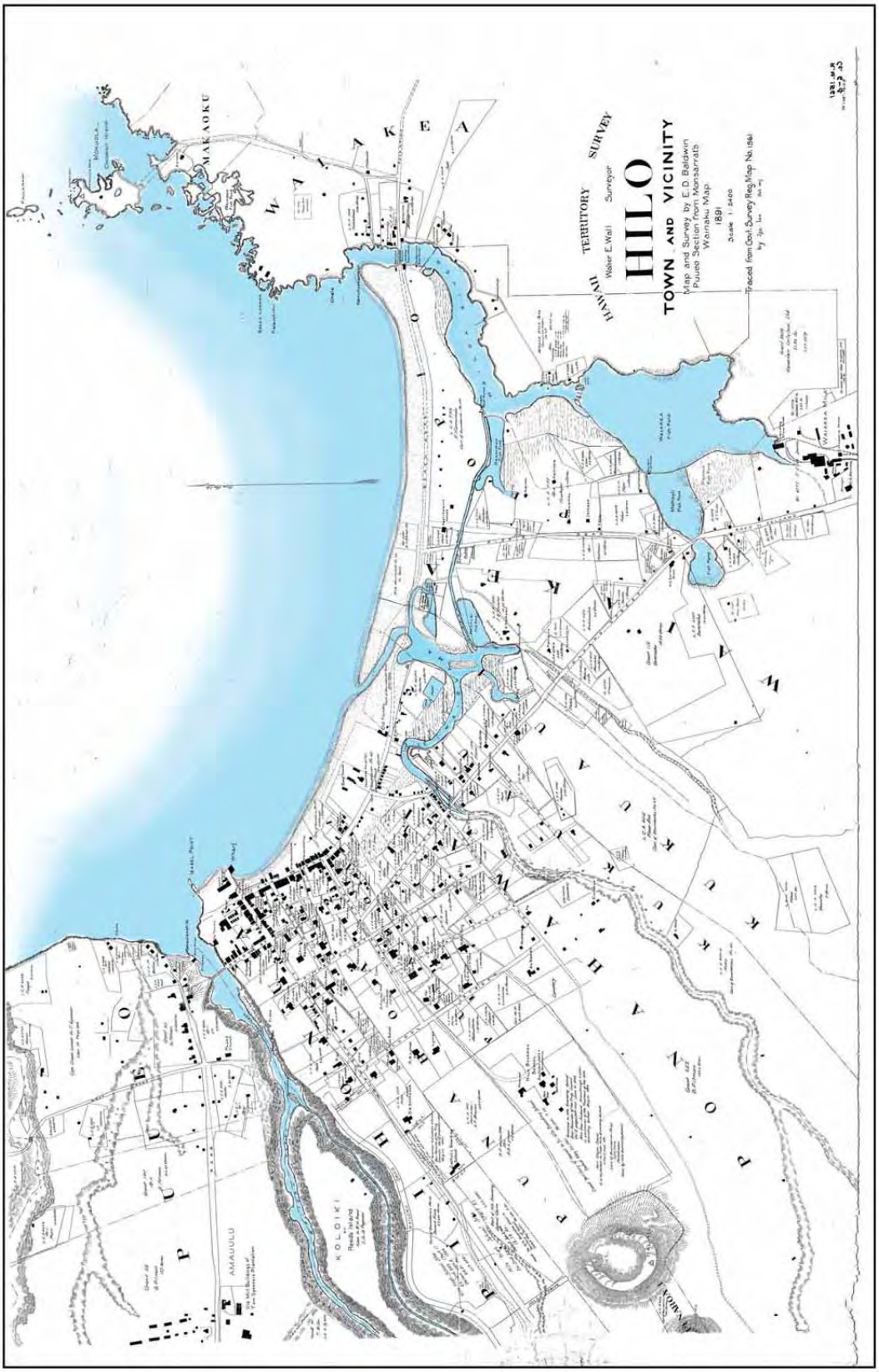

Figure 14. 1891 map of Hilo Town and vicinity (Government Survey register map 1561).

CONSULTATION

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the study area is vital. It is precisely to these individuals for whom meaning and value are ascribed to traditional resources and practices. Community members may also retain traditional knowledge and beliefs unavailable elsewhere in the historical or cultural record of a place.

Community Input

During the planning phases of the Hilo Bayfront Trails project, a substantial amount of community consultation was undertaken. A stakeholder advisory committee (Table 2) was established, which included numerous (49) individuals representing a wide range of community as well as agency interests. This stakeholder group met with project planners on eight separate occasions (Table 3) to help shape the project. In addition to the stakeholder committee meetings, during the planning phases of the project there were three community meetings (see Table 3) held at the Auntie Sally Kaleohano Lūʻau Hale. The meetings were well attended (89 at Public Meeting 1, 74 at Public Meeting 2, and 60 at Public Meeting 3), and the community members present seemed to portray a representative demographic cross-section (with respect to both age and ethnicity) of the adult Hilo population. Discussions at these public meetings included all aspects of the Hilo Bayfront Trails project, including discussions of cultural appropriateness. Robert B. Rechtman, Ph.D. was present at all of the public meetings, and the community members in attendance were engaged collectively, in small groups, and individually.

With respect to potential cultural impacts, the point was made at these meetings that care should be taken to not disturb any burial areas and that interpretive signage should be developed that is both historically accurate and culturally appropriate. Traditional Hawaiian land divisions along the trail should be identified and attention should be paid to insuring correct spellings using diacritical marks. Those community members in attendance at the public meetings were very supportive of the project as a whole and worked with the project planners to refine the trail alignment and the nature and extent of the trail amenities.

Table 2. Hilo Bayfront Trails stakeholder advisory committee.

Name	*Organization*	*Title*
Crystal Atkins	County of Hawaiʻi (COH), Dept. of Planning	Transportation Coordinator
Ian Birnie	Dept. of Transportation (DOT), Harbors Division	Hawaiʻi District Manager
Sandy Bonk	Hawaiʻi Island Bicycle System	Advocates Member
Leonard Bisel	Leonard Bisel Associates, LLC	Landscape Architect
William Brilhante	COH Corporation Counsel	Deputy Corporation Counsel
David Brown	American Youth Soccer Hilo Region 274	Organization Member
Tom Brown	Downtown Improvement Association (DIA) / County Mass Transit Agency	President / Mass Transit Administrator
Kaholo Daguman	Connections Public Charter School / DIA	Teacher / Member
David Deluz, Jr.	Hawaiʻi Island Chamber of Commerce	Past President
Laura Dierenfield	Hawaiʻi County Bicycle and Pedestrian Committee / Peoples Advocacy for Trails Hawaiʻi (PATH)	Chair / Member
Elizabeth Dykstra	COH Dept. of Research and Development	Grants Specialist
Patricia Engelhard	COH Dept. of Parks and Recreation	Director
Neil Erickson	VisionKeepers	Bicycle Advocate Member
Alex Frost	COH Dept. of Research and Development	Resource Center Coordinator
Susan Gagorik	COH Dept. of Planning	Long Range Planner
Donald Ikeda	COH Council District 2	County Councilor
Eric Kapono	Keaukaha Community Association	Member
John Kekua	Hawaiian Canoe Racing Association	President

continued on next page

Table 2 Continued.

Name	*Organization*	*Title*
Troy Kindred	COH Civil Defense	Administrator
James Komata	COH Dept. of Parks and Recreation Park	Planner
Peter Kubota	Hawaii Island Bicycle System Advocates	Member
Brad Kurokawa	COH Dept. of Planning	Deputy Director
James Leonard	Planning Consultant	Bicycle Advocate
Molly Lugo	COH Corporation Counsel Deputy	Corporation Counsel
Diane Ley	COH Dept. of Research and Development	Deputy Director
Wesley Matsunaga	State of Hawaiʻi, DLNR, Land Division	Land Agent
Glenn Mayeda	State of Hawaiʻi, DLNR, Small Boat Harbors	Hilo Agent for Wailoa Sampan Basin and Boat Harbor
Amy Miwa	COH Council District 2	Legislative Assistant
Pamela Mizuno	COH Dept. of Parks and Recreation	Deputy Director
Nancy Murphy	State of Hawaiʻi, DLNR, Small Boat Harbors	Hawaiʻi District Branch Manager
Paul Nash	VisionKeepers	Past Chair
Diane Noda	COH Corporation Counsel Deputy	Corporation Counsel
Shelly Pelfrey	UH-Hilo	Student
Sam Puluʻole	Hilo Downtown Improvement Association	Executive Director
Lukela Ruddle	Office of Hawaiian Affairs Hawaiʻi Island	Community Coordinator
Lawrence Scadden	Mayor's Committee on People with Disabilities	Vice Chair
Linda Schubert	Papahanaumokuakea Marine National Monument Discovery Center (NOAA)	Manager
Renee Schoen	COH Corporation Counsel	Deputy Corporation Counsel
Stephen Skipper	USDA-NRCS	Program Coordinator
Glenn Taguchi	State of Hawaiʻi, DLNR, State Parks	Parks District Superintendent
Roy Takemoto	COH Mayor's Office	Executive Assistant
Nimr Tamimi	Kanoelehua Industrial Area Association	Member
Stanley Tamura	State DOT, Highways Division	Manager
Jane Testa	COH Dept. of Research and Development	Director
Alan (Keone)Thompson	COH Dept. of Public Works	Civil Engineer
Ed Torrison	East Hawaiʻi Kiwanis Club	Past President
James Weller	State of Hawaiʻi, DLNR, DOCARE	Enforcement Officer
Harry Yada	COH Dept. of Finance	Property Manager

Note: Committee members served for various lengths of time; most members served for the duration of the master planning process.

Table 3. Hilo Bayfront Trails stakeholder and community meetings.

Date	*Venue*	*Type of Meeting*
August 31, 2006	Aupuni Center Conference Room	Stakeholder Committee Meeting 1
September 28, 2006	County Council Chambers	Stakeholder Committee Meeting 2
February 9, 2007	Mokupapapa Discovery Center	Stakeholder Committee Meeting 3
July 20, 2007	Aupuni Center Conference Room	Stakeholder Committee Meeting 4
October 9, 2007	Aunty Sally's Lūʻau Hale	Public Meeting 1
December 13, 2007	County Council Chambers	Stakeholder Committee Meeting 5
February 22, 2008	County Council Chambers	Stakeholder Committee Meeting 6
April 16, 2008	Aunty Sally's Lūʻau Hale	Public Meeting 2
June 20, 2008	County Council Chambers	Stakeholder Committee Meeting 7
December 10, 2008	Aunty Sally's Lūʻau Hale	Public Meeting 3
January 9, 2009	County Council Chambers	Stakeholder Committee Meeting 8

Focused Interviews

As part of the current assessment study interviews with four additional individuals with direct genealogical ties to the current study area were conducted. All of these individuals had ancestors that resided (and or had *kuleana* for lands) in and around the Wailoa/Waiolama area. One of these individuals is also the co-author of the current study.

Leslie Lang

Leslie Lang (the co-author of the current study) was interviewed on July 20, 2009 by Robert B. Rechtman, Ph.D. at the Rechtman Consulting, LLC office in Hilo. Leslie was born in 1962 in California and lived there until 1990 at which time she returned to her ancestral Hawaiʻi. While growing up, Leslie was very close with her paternal grandmother (Martha), who in turn was close with her maternal great grandfather, Leslie's great great great grandfather Nalimu. Leslie currently lives with her husband and daughter in Pepeʻekeo on her great grandmother's (Keahiloa) 50 acre homestead grant property; also the place where Nalimu spend the latter years of his life. Nalimu was born in 1835 in the Laupāhoehoe area and in 1840 moved with his family to Hilo (to the *ʻili kupono* of Piʻopiʻo) on the *kuleana* parcel LCAw. 5157 awarded to Kuahopu (most likely a relative of Nalimu's family). Nalimu's house is depicted on an 1891 map of Hilo (see Figure 14) in the vicinity of Hoakimau Fish Pond in the Wailoa River area. Nalimu attended Hilo Boarding School and became a missionary (adopting the name H. B. Nalimu) and traveled to Kiribati. In his latter years, during the early twentieth century, Nalimu lived with his granddaughter (Keahiloa) and great granddaughter (Martha) in Peʻepekeo. During this time and up until his death in 1934, Nalimu shared numerous *moʻolelo* with Theodore Kelsey, the written record of which has been preserved in Kelsey's notes curated at the Bernice Pauahi Bishop museum.

Leslie related family *moʻolelo* about the *piʻopiʻo* house and two *tsunami* events. The first pertained to a late nineteenth century *tsunami* that affected Hilo Bay. With full knowledge of the impending danger, Nalimu's mother, Kepalaoa, refused to retreat from the family home with the rest of her family members, choosing to stay in her rocking chair on the *lānai*. The ocean serge reached the house, but the water parted around it and when Kepalaoa's family returned she was safe still sitting in her rocking chair on the *lānai*.

The second event was related to the 1960 *tsunami* and the family graveyard in *piʻopiʻo*. During the cleanup effort that following this *tsunami*, the graveyard in the vicinity of the nineteenth century family house was destroyed by bulldozer activity. This hurt the family very much as the *iwi* were likely disturbed and headstones and funerary urns were never recovered.

When asked about the affects that the current proposed project might have on cultural resources, Leslie indicated that she felt the project area, including the area of her family's former residence and graveyard, have already been severely impacted and that pedestrian and bicycle traffic would not result in any additional impacts. She did feel that, as much as possible, the history of the area (both Precontact and Historic) should be presented in interpretive signage and that traditional place names should be perpetuated.

Manu Meyer

Manu Meyer was interviewed by Leslie Lang, M.A. on August 27, 2009 at the Hilo Boys and Girls Club garden, where she works with at-risk youth. Manu earned her doctorate degree from Harvard University researching Hawaiian epistemology, or indigenous philosophy of knowledge. Currently she is an Associate Professor of Education at University of Hawaiʻi at Hilo.

Manu moved to Hilo in 1985, when she was 25 years old. Though she was raised on Oʻahu, she has longtime family ties to Hilo. Her mother was Emma Aluli, whose mother was Emma Akana, born in Hilo of Leong Suk Kam (also known as "Akamu") who came to Hilo from China in the 1830s and became a sugar master. He married Alai-a-ʻI. Other well-known ancestors of Manu include Joseph Nawahī and Adam Baker. Born in 1854 in Puna, educated in Hilo (Hilo Boarding School) and Maui (Lahainaluna Seminary) and later residing in Hilo (Figure 15), Nawahī was a noted nineteenth-century lawyer and legislator, and along with "his wife Aima, started and edited the newspaper *Ke Aloha ʻĀina*, dedicated to the sovereignty of Hawaiʻi" (Lang 2007:103). Baker is credited as the owner/builder of Hilo's Palace Theater. In what Manu estimated to have been the 1700s, her ancestors were *kaukau aliʻi* (she defines this as an *aliʻi* class that acted as confidantes and advisers to the *aliʻi nui*) and *konohiki* of Waiōlama. More recently, her family lived at Kūkūau.

Figure 15. The Nawahī homes on Kapiʻolani Street around the turn of the century.

With respect to the proposed Hilo Bayfront Trails project, she said she would only have reservations if the development plans were to impact burials; but added that she doesn't know of or suspect any burials in the project area. Manu is very supportive of this project and enthusiastic about the idea of having walking and biking trails in Hilo, saying anything that gets people out of their cars and walking, where they can appreciate our rich history, rather than whizzing by this culturally complex and very significant area at 55 mph, is positive.

Manu talked about the cultural significance of Waiolama, and hoped that interpretive signage along pedestrian and biking trails will provide people with a good understanding of the area's history. Referencing the Hoʻolulu area, she discussed how it represents Hilo's historically competitive nature (also see the discussion of this area in Culture-Historical background section), which was in full force at the time of *makahiki*. She talked about the continued use of the Hoʻolulu area for swimming and baseball in particular, into modern times, and how during the twentieth century when different ethnic groups were settling in Hilo, these activities in this area acted as important social bonding agents. Manu expressed her interest in seeing the old place names used on the new trail system (she mentioned in passing that she is glad that the small island off Banyan Drive is again being called "Moku Ola") and historical markers that are culturally appropriate, perhaps with historic images next to modern images. Also important to her is the identification of waterways and features of the bay itself (such as the Kaipalaoa surf break), street names explained in terms of their history, and the story of why Hilo has the Kamehameha statue that was meant for Kauaʻi.

Luahiwa Lee Loy Namahoe

Luahiwa Lee Loy Namahoe was interviewed by Leslie Lang, M.A. at Kope Kope, a Hilo coffee house, on July 23, 2009. She grew up in Keaukaha and in Panaewa, where she currently lives, and graduated from Hilo High School in 1986. She is a Hawaiian language speaker who worked as Communications Coordinator for *ʻAha Pūnana Leo* for 15 years. In 2004, Luahiwa was selected as a Pacific Century Fellow; that program aims to 'develop leaders with a greater awareness and sensitivity to the people and institutions of Hawaiʻi.'

Her family has a long history in Hilo, where her great-great-grandmother, Mary Elizabeth Keakealani Sniffen, owned property at Waiōlama, although Luahiwa noted that on an 1891 Hilo map (see Figure 13), the property is listed under her great-great-grandmother's husband, G[eorge] Kaihenui's name. Luahiwa's paternal grandfather, Genesis Lee Loy, born in 1919, was raised on that property, roughly where the downtown Longs parking lot now stands. She described the family land as being approximately where Longs, Bank of Hawaii and the State Building currently stand; that family property was damaged by the 1946 tsunami. She does not herself know stories about the old family place.

Luahiwa supported the concept of walking and biking trails as described in the Hilo Bayfront Trails project, saying that the county should not "tempt the waters" by building anything more extensive there again. She had very specific ideas about the project, such as that pedestrian/bike paths should be wide, safe ones (like those at the University of California at Davis, she said) connecting to the Hilo High School area, where lots of kids travel on foot, as well as to the university. She would also like to see place name signs with the proper Hawaiian spellings and lots of water fountains.

As for the bay front itself, she hoped it would remain undeveloped parkland for families and tourists, with plenty of bathrooms, water fountains and pay phones for safety. With respect to landscaping along the trail, Luahiwa would encourage the planting of shade trees, and not coconut palms, which she noted need maintenance and can be dangerous. Also, she was concerned that shrubs could provide hiding places to predators. She wanted to see the paths lined with *noni*, banana trees, ti, and fruit trees that people can utilize, as well as a snack/smoothie kiosk in the Wailoa Center area.

When asked specifically about the effects that the current proposed project might have on cultural resources, Luahiwa indicated that she feels there is no longer anything of cultural significance in the study area that the water hasn't already taken away, and she didn't see any negative cultural impact. She did reemphasize that she hopes to see place name signs with the proper Hawaiian spelling.

Sean Kekamakūpaʻa Lee Loy Browne

Sean Kekamakūpaʻa Lee Loy Browne is a noted contemporary Hawaiian sculptor who frequently works in stone; a recent project was the sculpture he created for the front of the recently constructed Hilo Judiciary Building (Figure 16). He was born in Hawaiʻi in 1953 and attended the Kamehameha Schools. In 2001, he was named as one of Hawaiʻi's Living Treasures by the Honpa Hongwanji Mission. He teaches at the Art Department at Kapiʻolani Community College. His father was Genesis Lee Loy, who was born in the Waiolama area of Hilo in 1919. His family has a long history in that area (see information in the Luahiwa Namahoe interview).

Sean was interviewed by Leslie Lang, M.A. via telephone from his home on Oʻahu on August 21, 2009, and said that the new Hilo courthouse sits on that Waiolama land that had once belonged to his family. The family home, where his father Genesis Lee Loy and his father's siblings grew up, stood partly on the land where the downtown Longs now stands. He remembered visiting his paternal grandfather at that house after the 1960 *tsunami*. He was told by *kūpuna* that right across the street from the family home was a place where kids played called Kumu Springs. There was black sand there and a little cliff, with a small waterfall, they would jump off. Sean recalled that his wife's grandmother, Mary Kawena Pūkuʻi, remembered seeing a woman named Lee Loy chanting at that waterfall long ago.

With respect to the 1946 *tsunami*, Sean related a story of his *hānai* mom, Mieko Morimoto, who lived at Shinmachi near the present-day Wailoa Art Center. She was a senior at Hilo High School and was headed for school. She had an interview that day as she was applying to the University of Hawaiʻi at Mānoa, and her blouse had gotten dirty, so she turned around and instead of getting into a car with friends (who subsequently died in the *tsunami*) she returned home. When she reached home, her mother pushed her into the house. The first *tsunami* swell picked up the house and carried it down toward the ocean, dropping it on land. This happened three times, and it ended up 100 feet away from the original footing. They then made their way to the roof of the concrete, two-story bottling company building. There they fashioned makeshift ropes out of clothing and threw them into the water to try to help neighbors.

When asked about the Hilo Bayfront Trails project, he said that walking and biking paths make perfect sense for Hilo – they make the town more user-friendly and also encourage people to get more exercise. He noted that it is also a way to stem overdevelopment, and he supports this project because it will not rise above ground level. He said he thought it would be a nice addition to Hilo.

Figure 16. Browne's sculpture recently installed in front of the new Hilo Judiciary Building.

POTENTIAL CULTURAL IMPACTS

The Office of Environmental Quality Control (OEQC) guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are natural features of the landscape and historic sites, including traditional cultural properties. A working definition of traditional cultural property is:

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "Property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of "Property" wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often times cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Paʻakai O Kaʻāina* v Land Use Commission court case. The court decision established a three-part process relative to evaluating such potential impacts (*Ka Paʻakai* analysis): first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigation actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

There have been several prior studies in the coastal portions of the current study *ahupuaʻa*, eight of which (Kelly and Athens 1982; Pietrusewsky 1989; M. Rosendahl 1988; Smith and Tourtellotte 1988; Wolforth 2004, 2006a, 2006b, 2007) are of particular relevance to the current project. All of these studies were conducted for locations or at sites in an around the current project area. In the Kelly and Athens (1982:7) study it was concluded that although no sites were discovered there was the potential for the discovery of subsurface "historic or prehistoric Hawaiian agricultural remains" in the former Waiolama Marsh area. M. Rosendahl (1988) investigated two locations within the current Wailoa State Park area and found that there were no intact cultural resources. In the area near the mouth of the Wailoa Stream in the vicinity of the current Suisan Fish Market, human skeletal remains were discovered, excavated, and studied (Pietrusewsky 1989; Smith and Tourtellotte 1988). This discovery, while only that of a single set of remains, does indicate that the possibility exists for additional remains, especially in coastal areas of former dune deposits along the Hilo bay front. As Wolforth suggests, "sand dunes are a preferred burial location, and it should be expected that prehistoric burials once existed within some portion of the sandy shoreline of Hilo Bay" (2007:29). Wolforth conducted a series of archaeological and cultural studies for proposed parks within the greater Hilo Bay area: for Kūhiō-Kalanianaʻole Park (2004), for Reedʻs Bay Beach Park (2006a, 2006b), and for the Hilo Bayfront Beach Park (2007). As a result of his cultural impact assessment studies, Wolforth (2006b, 2007) concluded that the development of park and recreational facilities in the Hilo Bay area would not result in negative impacts to cultural resources or practices, but rather through careful planning could enhance the perpetuation of traditional cultural activities.

While it is clear from the background information and consultation presented in the current study that the entire area of the proposed Hilo Bayfront Trails project could be considered a historic/cultural landscape, it is also clear that this landscape has morphed through the years, and will no doubt continue to change along with the Hilo community. As such change is inevitable, it is important to retain past cultural and historical knowledge for the benefit of future generations. One element of the Hilo Bayfront Trails project that is specifically designed for this purpose is the interpretive and place name signage that is proposed to be established along the trailways. The information on the signs will highlight important cultural and historical places and events as well as identify the boundaries of the traditional Hawaiian land units through which the Hilo Bayfront Trails project extends

With respect to a *Ka Paʻakai* analysis, there were no specific resources or practices identified that would be impacted by the development and use of the trail network. In fact, many of individuals who were consulted believed that the development of the Hilo Bayfront Trails project would result in a positive community and cultural benefit. However, as was pointed out in the archaeological assessment study that was completed for the Hilo Bayfront Trails project (Rechtman 2009), the potential exists for as of yet undiscovered buried resources to be encountered during subsurface development activities. The archaeological assessment study (Rechtman 2009) contained a recommendation for archaeological monitoring of all potential ground-disturbing activities associated with currently undeveloped segments of the proposed trail alignment. That recommendation is supported here as a way to mitigate potential effects to any possible buried resources that might be unearthed, particularly in the vicinity of the Suisan Fish Market and within the Wailoa State Park, Waiolama Fields, and Hilo Bayfront Beach Park areas.

REFERENCES CITED

Bird, I.
1964 *Six Months in the Sandwich Islands*. Honolulu: University of Hawaii Press. Prepared for Friends of the Library. (1st edition: 1890)

Cordy, R.
2000 *Exalted Sits the Chief. The Ancient History of Hawai‘i Island*. Honolulu: Mutual Publishing.

Desha, S.
2000 *Kamehameha and His Warrior Kekūkaupi‘o*. Honolulu: Kamehameha Schools Press.

DMH, Inc.
1990 Hawaiian Fishpond Study Island of Hawai‘I, Maui, Lana‘i and Kaua‘i. Prepared for Hawaii CZM Program.

Ellis, W.
1963 *Journal of William Ellis*. Honolulu: Advertiser Publishing Co., Ltd.

Fornander, A.
1996 *Ancient History of the Hawaiian People*. Honolulu: Mutual Publishing.

Handy, E.S.C., E.G. Handy, and M. Pukui
1991 Native Planters in Old Hawaii: Their Life, Lore and Environment. *B.P. Bishop Museum Bulletin* 223. Honolulu: Department of Anthropology, Bishop Museum Press. (Revised Edition)

Hitchcock, D.
1897 *Forty Years' Reminiscence of Life in Hilo, Hawaii*. Published in the Hilo Hawaii Herald, May 27, 1897.

Hudson, A.
1932 Archaeology of East Hawaii. Report on file at the B. P. Bishop Museum.

I‘i, John Papa
1959 *Fragments of Hawaiian History*. Honolulu: Bishop Museum Press.

Ka‘aihue, M. (Editor)
1991 *Songs of Helen Desha Beamer*. Honolulu: Abigail K. Kawananakoa Foundation.

Kamakau, S.
1961 *Ruling Chiefs of Hawaii*. Honolulu: Kamehameha Schools Press.

1991 *Tales and Traditions of the People of Old, Nā Mo‘olelo a ka Po‘e Kahiko*. Honolulu: Bishop Museum Press.

1992 *Works of the People of Old: Nā Hana a ka Po‘e Kahiko*. Honolulu: Bishop Museum Press.

Kelly, M., and J. S. Athens
1982 Archaeological and Historical Studies for the Alenaio Stream Flood Damage Reduction Study, Hilo, Hawaii. Department of Anthropology, Bernice P. Bishop Museum. Prepared for U.S. Army Engineer Division, Pacific Ocean.

Kelly, M., B. Nakamura, and D. Barrère
1981 *Hilo Bay: A Chronology History*. Department of Anthropology, Bernice P. Bishop Museum. Prepared for U.S. Army Corps of Engineers, Honolulu District.

Lang, L.
2007 *Exploring Historic Hilo*. Honolulu: Watermark Press.

Lydgate, J.
1922 *Hilo Fifty Years Ago*. Thrum's Hawaiian Annual.

Lucas, P.
1995 *A Dictionary of Hawaiian Legal Land-Terms*. Native Hawaiian Legal Corporation.

Malo, D.
1951 Hawaiian Antiquities. *B.P. Bishop Museum Special Publication* 2. B.P. Bishop Museum Press, Honolulu. (2nd edition) (Translated by N. Emerson)

Maly, K. (translator)
1992-3 *Ka‘ao Ho‘oniua Pu‘uwai no Ka-miki* (The Heart Stirring Story of Ka-Miki). Published in Ka Hōku o Hawai‘i, January 8, 1914-December 6, 1917.

1996a Historical Documentary Research and Oral History Interviews: Waiākea Cane Lots (12, 13, 17, 18, 19, 10 &20-A), Land of Waiākea, District of South Hilo, Island of Hawai‘i. Kumu Pono Associates Report W01-0795 (III). Prepared for the Ho‘oikaika Club of the University of Hawai‘i, Hilo

1996b Appendix A In: Archaeological Assessment Study Hilo Judiciary Complex Project, Lands of Wainaku, Pōnohawai, Pi‘ihonua, and Waiākea, South Hilo District, Island of Hawai‘i (TMK: 2-6-15:1,2; 2-6-16:2; 2-4-49:18,19; 2-2-15:33; 2-4-1:12). Paul H. Rosendahl, Inc., Hilo. PHRI Report 1721-061496. Prepared for State of Hawai‘i, Honolulu.

McEldowney, H.
1979 Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo, Hawai‘i. Department of Anthropology, B.P. Bishop Museum, Honolulu. Prepared for U.S. Army Engineer Division, Pacific Ocean.

Moniz, J.
n.d. Historical and Archaeological Synthesis of Land Use and Settlement Patterns, Waiākea Ahupua‘a, Hilo, Hawaii. Manuscript on file at DLNR-SHPD Hilo Office (1994).

Pietrusewsky, M.
1989 Human remains Found at Wailoa Bridge Renovation Project, Waiakea, South Hilo. Department of Anthropology, UH-Manoa.

Pukui, M., Elbert, S., and Mookini, E.
1974 *Place Names of Hawai‘i*. Honolulu: University Press of Hawaii.

Rechtman, R.
2009 Archaeological Assessment Survey for the Hilo Bayfront Trails Project Area. Rechtman Consulting, LLC Report RC-0649. Prepared for Geometrician Associates, LLC, Hilo.

Rosendahl, M.
1988 Archaeological Reconnaissance Survey for Environmental Impact Statement, Hilo Judiciary Complex Sites. PHRI Report 356-040888. Prepared for Wilson Okamoto and Associates, Inc., Honolulu.

Smith, M., and P. Tourtellotte
1988 Wailoa Bridge Renovation Project, Site No. 50-10-11115 Burial Removal. DLNR-Historic Sites Section, Honolulu.

Stokes, J., and T. Dye
1991 *Heiau of the Island of Hawai‘i*. Bishop Museum Bulletin in Anthropology 2. Honolulu: Bishop Museum Press.

Thrum, T.
1907 Tales from the Temples. *Hawaiian Almanac and Annual for 1908*:48-78. Honolulu

1920 *Hawaiian Annual for 1921: The Reference Book of Information and Statistics Relating to the Territory of Hawaii*. Honolulu, Hawaii

Warshauer, K.

2003 Some Banyan Drive Signs Need Correction. *Hawaii Tribune-Herald*, April 27, 2003, Hilo.

2004 Famed Trees of Banyan Drive Still Mislabeled. *Hawaii Tribune-Herald*, April 11, 2004, Hilo.

Wolforth, T.

2004 Inventory Survey for the Proposed Kūhio-Kalaniana‘ole Park, Hilo: Investigations into the Kanakea Fishpond at Reed’s Bay TMK: 3-2-1-6:13 and 15. Scientific Consultant Services, Inc. Report B1. Prepared for The Rotary Club of East Hawai‘i.

2006a Inventory Survey for the Proposed Reed’s Bay Beach Park, Hilo. Scientific Consultant Services, Inc. Report. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

2006b Cultural Impact Assessment for the Proposed Reed’s Bay Beach Park, Hilo. Scientific Consultant Services, Inc. Report. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

2007 Cultural Impact Assessment for Hilo Bayfront Master Plan, North Hilo District, Island of Hawai‘i. Scientific Consultant Services, Inc. Report 771-1. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

APPENDIX A – Hilo BayFront Trails Project Tax Map Parcels and Rights-of-Way

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-3-004:001	State	Kaipalaoa Landing; vehicular roadway with metal gate for access to Wailuku River sewage pump site; USCG Lighthouse.	Trail markings on existing paving; gate renovation as necessary to allow pedestrian access when the metal gate is closed; interpretive signs # 22 and 23.
2-3-001:002	State	Moʻoheau Bus Terminal; one-way vehicular entry; pedestrian walkway from Kamehameha Ave. pedestrian crossing; Moʻoheau Bandstand; lawn area with large canopy trees; baseball field and small storage structure; chain link fence at edge of Bayfront Highway.	Shared use path; trail markings on existing pedestrian walkway; trailhead sign; interpretive signs # 18b, 19b; landscape enhancement along *mauka* side of existing fence.
2-2-005:002	State/County	Ball fields; two off-street parking lots, one with low retaining wall on two sides; coconut palm grove; chain link fence at edge of Bayfront Highway.	Shared use path; wheel stops in the *makai* stalls of parking lots; reconfiguration of easternmost parking lot and associated low retaining wall demolition to accommodate shared use path; relocation of approx. 7 coconut palms; landscape enhancement along *mauka* side of existing fenceline; interpretive sign #16b.
2-2-004:035	State	Lawn area with exceptional monkeypod tree.	Shared use path; landscape enhancement along *mauka* side of existing fence.
2-2-004:028	State	Lawn area with exceptional monkeypod trees.	Shared use path; interpretive sign # 15b.
2-2-006:026	State	Lawn area with coconut palms.	Shared use path.
2-2-006:001	County	Flood control area with berm; lawn area with grove of coconut palms along Ponahawai St.; open lawn area with a row of rainbow shower trees along Kamehameha Ave. and adjacent to Kumu St. parking and sidewalk.	Shared use path with ahupuaʻa plaque (18a); trailhead sign; parking lot (approx. 20 stalls); interpretive signage/monument 18a; rainbow shower tree relocation (8) between berm and Kamehameha Ave. sidewalk.
2-2-007:018	State	Fields for soccer (4 youth); Waiōlama Canal; shade structure; and announcement board.	Two-way bicycle route along parking lot drive.
2-2-004:002	County	Fields for soccer (3 older youth); rainbow shower trees along Kamehameha Ave.; chain link fence 40'-0" from *mauka* edge of existing sidewalk along Kamehameha Ave.	Shared use path along *makai* side of existing chain link fence paralleling Kamehameha Ave.; shared use path parallel to Pauahi Street; footing for shared use path bridge; trailhead sign and interpretive sign # 16a.
2-2-011:001	State	Fields for soccer (3 youth); Waiōlama Canal with adjacent shade trees; bridge; rest room and outdoor shower area; unpaved parking area bounded by wheel stops; shade trees and coconut palms near top of slope.	Shared use path; interpretive sign # 17; native tree grove on top of slope.

continued on next page

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-2-011:016	State	Lawn area with shade trees and palms; Waiōlama Canal.	Shared use path and bridge over Waiōlama Canal; interpretive sign # 15a.
2-2-006:027	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Ponahawai St./Kamehameha Ave. corner.
2-2-004:060	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
2-2-004:025	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
2-2-004:001	State	Vehicular entry via Pi‘opi‘o St. to recreation area; lawn areas with trees; Wailoa River State Recreation Area signage.	Shared use path.
2-2-003:003	State	Bishop St.; portion of Punahoa St. and Pi‘opi‘o St.; King Kamehameha statue and interpretive signage (2); Pacific Tsunami Museum Shinmachi interpretive signage (1); lawn area with canopy trees and coconut palms; fields for soccer.	Shared use path up to and over Pi‘opi‘o St. bridge; barrier on bridge to separate shared use path from vehicular lanes marked pedestrian crossings at Pi‘opi‘o St. and Bishop St.
2-2-012:001	State	Lawn area with canopy trees and coconut palms; Pi‘opi‘o St. bridge.	Shared use path after Pi‘opi‘o Street bridge crossing if not accommodated in 2-2-013:003.
2-2-013:003	State	Wailoa Center; War Memorial; Shinmachi Tsunami Memorial; vehicular roadways and parking; Hoakimau Pond; Wailoa River with single arched bridge; asphalt paths; lawn areas with canopy trees and coconut palms.	Shared use path.
2-2-031:001	State	Waiākea Fish Pond and some surrounding land; migratory bird resting area “fingers.”	Shared use path with marked pedestrian crossings at boat ramp, from Pi‘ilani St. proposed bike route; and across large pavilion service drive; trailhead sign; interpretive signs # 26, 27a, 27b, 28; potential adjustment to a portion of covered walkway at pavilion cluster to accommodate bicycles on shared use path; potential moving bridge over Wailoa River.
2-2-011:016	State	Lawn are with shade trees and palms; Waiōlama Canal.	Shared use path and bridge over Waiōlama Canal; interpretive sign # 15a.
2-2-002:001	State	Lawn area with trees and palms.	Shared use path; potential bridge footing; interpretive sign # 14.
2-2-014:002	State	Sloped and level lawn areas.	Shared use path; interpretive sign # 29.
2-2-029:008	State	Unimproved off-street parking; lawn area with canopy trees.	Shared use path; trailhead sign; interpretive sign # 30.

continued on next page

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-2-029:027	State	Mohoʻuli Pond and its edges, including "fast land."	Shared use path; potential bridge at the mouth of the pond.
2-2-029:001	State	Waiākea Stream from outlet of flood control channel; lawn area with trees and palms south of the stream and adjacent to Waiākea Pond; portion of Maile Street.	Shared use path; potential bridge; trailhead sign; parking lot (approx. 40 stalls); small quantity tree relocation.
2-2-053:019	Private parcel	Private roadway (Maile Street).	Shared use path.
2-2-053:020	Private parcel	Unused.	Shared use path.
2-2-003:023	State	Lawn area with trees and palms adjacent to Waiākea Pond.	Shared use path.
2-2-031:015	State	Vegetated area; storm drain easement at south end of parcel.	Shared use path (possibly a boardwalk with footings in water); possible storm drain extension.
2-2-033:001	County	Hoʻolulu Complex.	Interpretive sign # 31.
2-2-004:056	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod trees.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-003:046	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod tree.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-002:035	State	Portion of Hilo Bayfront Beach Park.	Trail markings on future shared use path and interpretive sign # 13 coordinated with Hilo Bayfront Beach Park improvement plans.
2-2-001:027	State	Portion of Hilo Bayfront Beach Park.	Trail markings on future shared use path and interpretive sign # 12 coordinated with Hilo Bayfront Beach Park improvement plans.
2-1-001:012	State	Golf course and driving range.	Shared used path; trailhead sign.
2-1-001:102	State	Berm at corner of Lihiwai Street and Kamehameha Avenue.	New shared use path with inside railing; trailhead sign.
2-1-003:001	County	Liliʻuokalani Gardens.	Trail markings on existing pedestrian walkways; one-way bicycle route; interpretive signs # 9, 10a, 10b, 11.
2-1-003:019	County	Moku Ola or Coconut Island, Por. Liliʻuokalani Gardens.	Trail markings on existing pedestrian walkways; interpretive signs # 7, 8 to be coordinated with interpretive signage by Pacific *Tsunami* Museum
2-1-005:001	State	Reed's Bay Beach Park.	Trail markings on future pedestrian walkway and interpretive sign # 5 to be coordinated with implementation of Reed's Bay Beach Park improvements.
2-1-006:010	County	Kanakea Pond (Ice Pond).	Cantilever pedestrian boardwalk and viewing deck.
2-1-009:007	State	Hilo Harbor.	Interim trail markings and marked pedestrian zone and crossing on existing paving from Pier 1 shed to main gate at Kūhiō Street. This may require adjusting the location of parking stalls and barriers along this route.

Rights-of-way within the project area: ownership and uses.

Rights-of-Way	*Ownership*	*Current Use*	*Trail Action*
Wailuku Drive: Kamehameha Ave./Kaʻiulani St.	County	One-way (Kamehameha Ave./Kinoʻole St.) and two-way (Kinoʻole St./Kaʻiulani St.) vehicular roadway; sidewalk on Downtown Hilo side; curb and gutter; parking; marked pedestrian crossings with ramps; riverside planting.	One-way and two-way bicycle routes; interim trail markings on existing pedestrian walkway; trail markings on future pedestrian walkway in Wailuku Riverwalk; interpretive signs # 24, 25 coordinated with Pacific Tsunami interpretive signage and implementation of Wailuku Riverwalk plans.
Kekaulike Street: Wailuku Dr./ Waiānuenue Ave.	County	One-way vehicular roadway; curb and gutter; sidewalks; marked pedestrian crossings.	Trail markings on existing pedestrian walkway.
Kaʻiulani Street: Wailuku Dr./ Waiānuenue Ave.	County	Two-way vehicular roadway.	Two-way bicycle routes.
Kapiʻolani Street: Waiānuenue Ave./Haili St.	County	Two-way vehicular roadway (except on certain days and times); sidewalks; curb and gutter; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Waiānuenue Avenue: Kamehameha Ave. /Haili St.	County	One-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Haili Street: Kapiʻolani St./ Kamehameha Ave.	County	Two-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Bayfront Highway Wailuku River Bridge/Pauahi St.	State/County	Two-way vehicular roadway; planted median (noncontiguous); paved shoulders; *mauka* side turf strip with chain link fence at property line; *makai* shoreline revetment wall (noncontiguous).	Two-way bicycle lanes; marked pedestrian crossing at Waiānuenue Ave.; sign for Hāmākua-bound users of proposed Bayfront Highway bike lane that there is no outlet until Waiānuenue Ave. proposed marked pedestrian crossing.
Bayfront Highway Pauahi St./Wailoa Bridge	County	Portion of Hilo Bayfront Beach Park used for parking and driving lanes and bicycle route.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
Kamehameha Avenue Waiānuenue Ave./ Kamehameha Ave.	County/State	Two-way vehicular roadway with painted median (noncontiguous); paved shoulders; parking; curb and gutter; sidewalks; marked pedestrian crossings; rainbow shower street trees.	Two-way bicycle lanes; trail markings on existing pedestrian walkways; interpretive signs # 19a, 20, 21 embedded in existing pedestrian walkway.

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Rights-of-way within the project area: ownership and uses.

Rights-of-Way	*Ownership*	*Current Use*	*Trail Action*
Kamehameha Avenue: Kamehameha Ave./Kalaniana‘ole St.	County/State	Two-way vehicular lanes; curb and gutter (noncontiguous); Wailoa Bridge with curb and gutter, pedestrian walkways with railings; *makai* asphalt pedestrian paving from Lihiwai St. to Banyan Dr.; paved shoulders.	Two-way bicycle lanes; bridge lane restriping, barrier installation; sidewalk renovations/expansion for shared use path over bridge.
Kumu Street: Kamehameha Ave./end	County	Two-way parking aisle; curb and gutter; parking; sidewalks.	Two-way bicycle route.
Kawelolani Street: Wailoa River State Recreation Area/Manono St.	County	Unimproved right-of-way with water easement.	Shared use path; trailhead sign.
Pi‘ilani Street: Kanoelehua Ave./Wailoa River State Recreation Area	County	Two-way vehicular roadway.	Two-way signed shared road; two-way bicycle routes.
Manono Street: Kamehameha Ave./Pi‘ilani St.	County	Two-way vehicular roadway; sidewalk on Ho‘olulu Complex side; street trees.	Two-way bicycle lanes; marked pedestrian crossings at Kawelolani St. ROW and at Pi‘ilani Street.
Lihiwai Street: Kamehameha Ave./Banyan Dr.	County	Two-way vehicular roadway; parking; curb and gutter; sidewalks; marked pedestrian crossings.	Two-way bicycle routes; trail markings on existing pedestrian walkway; trailhead signs (2).
Banyan Drive: Banyan Way/Lihiwai St.	County	Two-way vehicular roadway with planted median (noncontiguous); curb and gutter; parking; sidewalk on *makai* side; banyan trees.	Two-way bicycle routes; trail markings on existing pedestrian walkway; shared use path; trailhead signs (2).
Banyan Drive: Banyan Way/ Kamehameha Ave.	County/State	Two-way vehicular roadway with planted median; paved shoulder; curb and gutter.	Two-way bicycle routes.
Banyan Way: Banyan Dr./ Kalaniana‘ole St.	County	Two-way vehicular roadway; parking on *makai* side; *makai* asphalt curbs and asphalt pedestrian walkway with metal railing on retaining wall.	Two-way bicycle routes; trail markings on existing pedestrian walkway.
Kalaniana‘ole Street: Banyan Way/Kūhiō St.	County	Two-way vehicular roadway with shoulder for bike route; asphalt curb and pedestrian walkway (discontinuous); landscape strip; ROW fronting 21-7:9 improved with curb, gutter, sidewalk, landscape strip.	*Makai* side: curb, gutter, pedestrian walkway with trail markings; shoulder for bicycle route.
Kūhiō Street: Kalaniana‘ole St./ Hilo Harbor main gate	County	Two-way vehicular roadway with shoulders; curb, gutter, chain link fence with barbed wire, and pedestrian walkway on west side of ROW.	West side: trail markings on existing pedestrian walkway; landscape enhancements; interpretive sign # 1 interim location.

ENVIRONMENTAL ASSESSMENT

HILO BAYFRONT TRAILS

Hawai‘i County
Department of Research and Development

Appendix 4b
Archaeological Assessment

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RC-0649

Archaeological Assessment Survey for the Proposed Hilo Bayfront Trails Project

Pi‘ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea *ahupua‘a*
South Hilo District
Island of Hawai‘i

DRAFT VERSION

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November 2009

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ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0649

Archaeological Assessment Survey for the Proposed Hilo Bayfront Trails Project

Pi‘ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea *ahupua‘a*
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RECHTMAN CONSULTING

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INTRODUCTION

At the request of Ron Terry, Ph.D. of Geometrician Associates LLC, on behalf of the County of Hawai‘i, Rechtman Consulting, LLC has prepared this archaeological assessment for the Hilo Bayfront Trails project. This project was initiated with a grant from the Hawai‘i Tourism Authority through its Natural Resources Program, with matching resources provided by the County of Hawai‘i. In overview, the Hilo Bayfront Trails Project will incorporate a variety of multimodal (shared pedestrian and bicycle) paths, pedestrian walkways, dedicated bicycle paths, and dedicated bicycle lanes within existing vehicular roadways. The project area extends over two miles from the Wailuku River to the Kūhiō Street entrance of the Hilo Harbor (Figure 1). It lies in close proximity to Hilo Bay, spans five primary[1] *ahupua‘a* in the district of South Hilo, and directly involves forty separate Tax Map parcels and twenty roadway rights-of-way (Appendix 1). Most of this area is publicly owned open space under the jurisdiction of either the County of Hawai‘i Department of Parks and Recreation or the State of Hawai‘i Department of Land and Natural Resources State Parks Division (Figure 2).

This study was undertaken in accordance with Hawai‘i Administrative Rules 13§13–284, and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawai‘i Administrative Rules 13§13–276. According to 13§13-284-5 when no archaeological resources are discovered during an archaeological survey the production of an Archaeological Assessment report is appropriate. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department. The current study was prepared in support of an Environmental Assessment compliant with HRS Chapter 343.

Below is a description of the general project area and the proposed development activities. This is followed by a detailed background section providing a culture-historical setting and context, a presentation of previous archaeological work conducted in the vicinity of the current study area, and current survey expectations based on the information obtained from the previous work. Also presented are an explanation of the project’s methods, and the findings of the archaeological field survey. Lastly, recommendations are presented for future historic preservation work.

PROJECT AREA DESCRIPTION AND PROPOSED DEVELOPMENT ACTIVITIES

The Hilo Bayfront Trails Project includes a variety of multimodal paths, pedestrian sidewalks, dedicated bicycle lanes and shared roads for bicycles spanning the more than two mile distance between Hilo Harbor and the Wailuku River (Figure 3). The project also proposes loops for the areas of downtown, Waiolama playfields, and Wailoa State Park; and also a multimodal loop at the County’s Bayfront Beach Park (see Figure 3). Specifically, at its eastern end the project begins at the Kūhiō Street entrance to the Hilo Harbor, where cruise ship passengers currently disembark. From Kūhiō Street, the trail is a shared use path that travels westward along Kalaniana‘ole Street to Banyan Way and then to Banyan Drive. Along Banyan Drive to Manono Street (the Waiākea Peninsula) there is the existing walkway, with a scenic coastal 0.6-mile loop around Queen Lili‘uokalani Gardens and out to Moku Ola (Coconut Island). In this area the trail includes a proposed shared-use path on the interior of Banyan Drive and along Kamehameha Avenue *mauka* of the peninsula, making a complete 1.4 mile circle around the peninsula’s Naniloa Golf Course. Existing parks present in this segment include Reed’s Bay County Beach Park, Coconut Island County Park, Lili‘uokalani Gardens County Park, the County recreational area known informally as “Isles”, and a small County recreation area called Happiness Gardens.

[1] Two (Kūkūau and Punahoa) of the five primary *ahupua‘a* are further divided into two parts, making seven *ahupua‘a*.

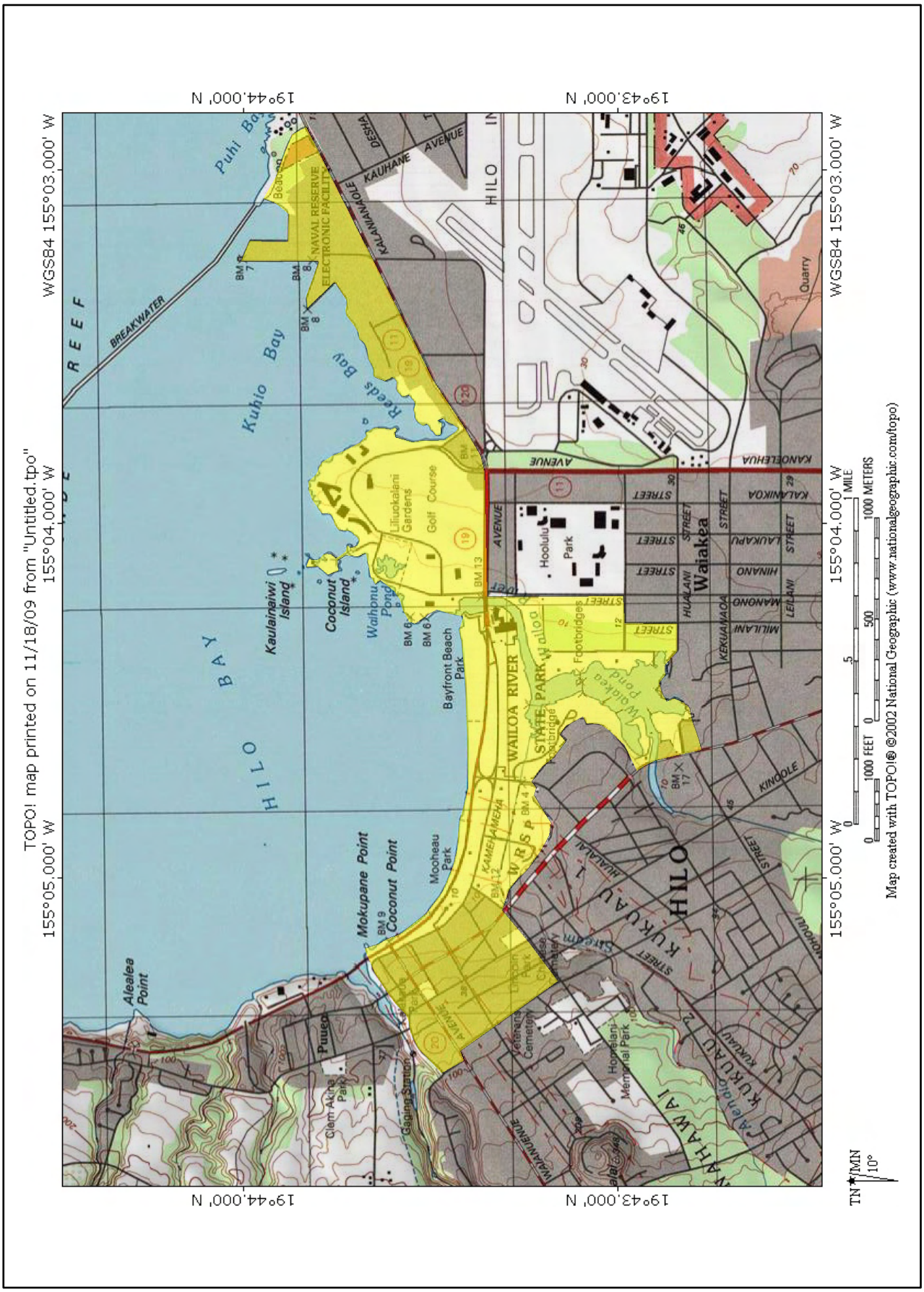

Figure 1. General location of the Hilo Bayfront Trails project (shaded yellow).

Figure 2. General project area showing land ownership.

Figure 3. Hilo Bayfront Trails master plan.

From the western intersection of Banyan Drive and Kamehameha Avenue, the project features a shared-use path extending west and *makai* of Kamehameha Avenue before looping toward the shore and the Hilo Bayfront Beach Park and the existing canoe *halau*. This segment includes Hilo Bayfront Beach Park. This multi-use path continues in a westerly direction, moving *mauka* of the Bayfront Highway at the Pauahi Street intersection and continues to the vicinity of the Hilo Farmers Market on Mamo Street in downtown Hilo. County recreational areas here include various multi-use playing fields between Kamehameha Avenue and Bayfront Highway and Mooheau Park.

The project includes a variety of additional loops of multi-use pathway extending *mauka* to be accessed from existing sidewalks along Pauahi Street. One would circle Waiākea Pond in Wailoa State Park and a portion of the Wailoa River, making use of three existing bridges and one more to be constructed, with side routes to Manono Street to the east and Kilauea Avenue to the southwest. Most of the route in the Wailoa State Park loop would occur on existing trails, streets, or across park lawns. Some areas would require substantial removal of vegetation, and one area would require acquisition of either property or easements. As currently planned, the trail would make a straight line between the pavilions at Wailoa State Park and Manono Street along Kawelolani Street, a "paper road" that is County property. Another roughly one-mile loop would circle a portion of the playfields *mauka* of the Waiōlama Canal on the west side of Pauahi Street, with a side route along the *mauka* side of Kamehameha Avenue and along Ponahawai Street to Kīlauea Avenue. In downtown Hilo, the project includes use of existing sidewalks that would be marked to clearly guide trail users from the bay front area up Haili Street and Waiānuenue Avenue.

In a year-long collaborative process with key stakeholders as well as with the community at large, the following underlying mission for the Hilo Bayfront Trails Project was established: To increase non-vehicular access in and around the Hilo bay front area for both residents and visitors alike, enhancing the area's natural beauty and highlighting the area's cultural significance, while at the same time ensuring environmental protection for the fragile coastline and connecting waterways. Most of the trail alignments and proposed amenities are located close to the bay front and occur predominantly on public County and State road rights-of-way and other County and State lands. A few trail segments will require land purchases or easements across private lands (see Figure 2).

Trail alignments will provide the physical means for walking, running, biking or skating from one location to another within the project area. Trail amenities are located near the trail alignments to provide basic resources, trail information, and educational information about the natural and cultural resources of the project area. Some trail elements will be new to the project area; other trail elements already exist in the project area and will be incorporated into the Hilo Bayfront Trails project. The trail interfaces with infrastructure being developed in separate ongoing County Department of Parks and Recreation projects, including the Wailuku Riverwalk, the Hilo Bayfront Beach Park, the Reed's Bay Beach Park (which includes the Kūhiō-Kalaniana‘ole Park), and Kaipalaoa Landing (see Figure 3).

The Hilo Bayfront Trails project accommodates pedestrians, bicycles, and other non-motorized vehicles over a variety of trail alignments. These alignments are called "trails" to emphasize their recreational purpose and role in providing access to and enhancing views of the natural and cultural resources of the project area. All of the alignments will be paved; and links between types of alignments have been carefully considered to maximize connectivity of the entire network, adopting existing infrastructure wherever possible. In addition to new or newly marked paths, the project involves establishing new parking areas and landscape areas, and the placement of up to thirty interpretive signs identifying locations of interest (Table 1). Also, *ahupua‘a* and certain *‘ili* boundaries will also be marked along the course of the trail system, informing trail users which land division they are entering and which they are leaving in an effort to enrich the connection of past and present. Interpretive signage near these boundaries will describe the significance of the land divisions.

Table 1. Proposed interpretive locations within the Hilo Bayfront Trails project area.

Location No.	*Theme(s)/Subjects for Interpretation*
1	Harbor: Hilo's early trade and commerce. Development of harbor facilities. Sugar trade.
2*	Abandoned Railroad Right-of-Way: 1878 act signed by King Kalākaua promoted the construction of railroads. Railroad important for carrying passengers as well as goods, most importantly sugarcane. *Tsunami* of April 1, 1946, shut down the railroad in Hilo.
3*	Fishponds: Ancient uses and historic uses.
4	Kanakea/Ice Pond: Traditional and modern uses.
5	Banyan Drive: Trees planted starting in 1933 honoring important visitors and others.
6	Makaokū: Traditional name for the area. Once the location of a significant and unique *heiau*. Discussion of heiau and associated ritual.
7	Mokuola (general): Puʻuhonua, healing waters.
8	Mokuola (specific): *Kaulaʻināiwi*, *Puaʻakāheka*.
9	Mauna Kea/Hilo Town: Clear day sign to see the entire landscape from coastal zone to mountain peak (from the realm [*wao*] of man to the realm of the gods).
10a-b	Queen Liliʻuokalani Gardens: Traditionally, Waihonu Pond. History of modern gardens.
11	Breakwater: Designed to calm the waters of the harbor, not as a protective measure against *tsunami*. Constructed between 1908 and 1929.
12	Hilo Iron Works Building: Hilo Iron Works in business from 1865 and ends 1983. Building is a C. W. Dickey design.
13	Hilo Bay: Traditionally called *Hilo one*. Hilo, the first moon phase, is mirrored in the shape of the bay, which housed Kamehameha's canoe fleets and remains the location of a recreational canoe fleet.
14	ʻIli Piʻopiʻo: Hilo residence of Kamehameha. Later Japanese community of Shinmachi, which was devastated by the April 1, 1946, tsunami. Never rebuilt and now used for sports fields.
15a-b	Waiākea/Kūkūau 1: Ahupuaʻa boundary.
16a-b	Kūkūau 1/Kūkūau 2: Ahupuaʻa boundary.
17	Agricultural (*kipi*) Area: River diversion into channel and unique form of agriculture.
18a-b	Kūkūau 2/Ponahawai: Ahupuaʻa boundary.
19	Ponahawai/Punahoa 1-2: Ahupuaʻa boundary. Waiolama, former marsh.
20	Punahoa 1-2/Piʻihonua: Ahupuaʻa boundary.
21	Hilo Landing/Pier: Built and rebuilt between 1863 and 1890 at the foot of Waiānuenue Avenue.
22	Kaipalaoa Heiau: Located in this general vicinity. Tied to ʻUmi and Kamehameha I and Liholiho. Destroyed in Kuakini's (1820s) time.
23	Piʻihonua/Wailuku River: Ahupuaʻa boundary. Wailuku means "waters of destruction." Accurate physical description and distinction. Home to Hina.
24	Maui's Canoe: Maui/Moʻo Kuna story.
25	Wailoa River/Small Boat Harbor: Former estuary area of the Waiākea Stream. Currently the Wailoa Sampan Basin and Small Boat Harbor.
26a-b	Chiefly Hawaiian Fishponds: Waiākea-Mohouli-Waiāhole-Kalepolepo. Collectively these ponds were stocked with the favorite fishes of the ruling chief and were considered to be significant places reserved for royal use.
27	Waiākea Mill: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use.
28	Waiākea Mill/Mohouli Pond: Mill established in 1879. History of operation and use of pond. Brief sugar history. Modern pond use. Wall dividing traditional pond boundaries.
29	Kalepolepo: *ʻIli* boundary with Piʻopiʻo. Location of a former fishpond. Legendary competition grounds for Hilo chiefs. Ka-Miki story.
30	Hoʻolulu Complex: History of recreational facilities in this location, starting with the opening of Hoʻolulu Park in 1900 and including the Merrie Monarch Festival venue: the Edith Kanakaʻole Multi-Purpose Stadium.

*These locations were under consideration during the planning process but the trail as currently conceived no longer passes by these sites.

CULTURE-HISTORICAL CONTEXT

Traditionally, greater Hilo was divided into three areas with place names that have their origins in legendary times: *Hilo-Hanakāhi* ("Hilo of the Chief Hanakāhi," which included Waiākea-Panaʻewa) to the south; *Hilo-one* ("The sandy shoreline zone of Hilo Bay"); and *Hilo-pali-kū* ("Hilo of the upright cliffs," which extended from the Hāmākua side of the Wailuku River north to Kaʻula Gulch). The Hilo Bayfront Trails project encompasses several *ahupuaʻa* (native land divisions) that lie within all three of these areas. To the west, the project area includes the *ahupuaʻa* of Piʻihonua (bordered by the Wailuku River); it includes the adjacent *ahupuaʻa* of Punahoa, and then continues through Pōnāhawai, Kūkūau, and Waiākea along with the *ʻili kupono* of Piʻopiʻo.

The names of the legendary rulers of the area are identified with the place names for several land units (both the *ahupuaʻa* and their component *ʻili*) that make up Hilo. Many of these names survive today, but only as localities or street names; their cultural and contextual meanings are rarely if ever conveyed. These include, but are not limited to, Waiākea, Panaʻewa, Piʻihonua, Haili, Kalepolepo, Kāwili, ʻOhele, ʻŪpēloa, Kaūmana, and Hilo-Hanakāhi.

Legendary sources indicate that Hilo was, among other things, renown for its rain and fertility, and that its inhabitants were expert in *hula*, fighting, and other traditional competitions including running, fishing, debating, and solving riddles. Walking the ancient trails of legendary times, travelers often encountered obstacles they had to overcome through both ingenuity and competition.

One such legendary tale, *Kaʻao Hoʻoniua Puʻuwai no Ka-Miki* (Heart Stirring Story of Ka-Miki), was published in a series of articles between 1914 and 1917 in Hilo's Hawaiian language newspaper *Ka Hōkū o Hawaiʻi*. The Hawaiian text of these newspaper articles was translated by Kepā Maly (1992-93); and one passage of this story about two supernatural brothers, Ka-Miki (the adept one) and Maka-ʻiole (Rat eyes) who circumnavigated Hawaiʻi Island on foot along the *ala loa* and *ala hele* (trails and paths) in the 1300s, relates the competitive nature of the Hilo chiefs as well as associates legendary characters with specific places. The names of many of these characters are preserved today in the many place names of Hilo.

> . . . Ka-Miki, Maka-ʻiole and their companion Keahialaka departed from the compound of Kapuʻeuhi (in ʻŌlaʻa) and descended the *ala loa* towards Hilo to continue their journey. The travelers arrived at a large compound and community, where they saw a man coming towards them with a club. This man was Kūkulu-a-hāne-pū (Kūkulu). Kūkulu was a guardian of the chiefess and lands called Panaʻewa-nui-moku-lehua (Great Panaʻewa of the *lehua* forest). Panaʻewa was a sacred chiefess of Hilo, the sister of the chiefs Waiākea and Piʻihonua.
>
> The chiefess' compound and surrounding community were forbidden to strangers, and Kūkulu regularly killed unaware travelers (thus the name "Unjust" place). Kūkulu challenged Ka-Miki *mā* but he was quickly defeated, and Ka-Miki left him there as an example to other *ʻōlohe* and to receive his due justice. Ka-iki *mā* then continued their journey into Hilo, seeking out ʻŪpēloa, uʻu-aho-hilo-loa, and Haili-kula-manu.
>
> The lands of Waiākea were named for the high chief Waiākea-nui-kumuhonua, the brother of Piʻihonua-a-ka-lani (k) and Panaʻewa-nui-moku-lehua (w). After departing from Panaʻewa, Ka-Miki *mā* met Haili-kula-manu, who was a guardian of Waiākea. Haili led Ka-Miki and his companions to his chief's compound at Kalepolepo. Arrangements were made for Ka-Miki to compete with the *ʻōlohe* – experts of Waiākea, with the event to be held at the *kahua* (contest site) at Kalepolepo. ʻŪpēloa the champion – land administrator and war councilor of Waiākea, and an expert fighter with *ʻOkaʻa a lāʻau* (war clubs) was called to Kalepolepo.
>
> The *kūkini* Kuʻu-aho-hilo-loa went throughout the region announcing that contests would be held at Kalepolepo, and in a short time the entire area was filled with people, all wondering who would attempt competing against ʻŪpēloa. Ka-Miki *mā* were then called to the arena, thus Ka-Miki—who is the image of the war club of Ka-uluhe-nui-hihi-kolo-i-uka—entered the *kahua* and the contest rules were set. It was agreed that the method of

competition would be *‘ōka‘a lā‘au* [war club fighting], and that the loser would be killed and baked in an *imu*.

‘Ūpēloa exited the *hālau mokomoko* (contestants’ long house) with great agility and speed, and the crowd cried out with excitement at his ability. ‘Ūpēloa also held his finely worked club which was called *‘Ohi-ka-lau-o-ke-pāhili*, the club was also called *Ka-piko-o- Wākea*. ‘Ūpeloa was so strong, that no competitors had ever stood up to him. As ‘Ūpēloa and Ka-Miki stood on the *kahua*, readying to fight—Pi‘ikea, the spear fighting expert of the chief Nā-mau‘u-a-Pā‘ao asked, “O youth where is your club that you may stand against the spear fighting warrior of the chief Waiākea-nui-kumuhonua?”

Ka-Miki answered, “I have no club, my only weapon is my hands, but I have learned to use the war club from my club fighting teacher, I have used green *hau* spears, stripped like the *maile* (*Alyxia olivaeformis*), I have used clubs made of the *uhiuhi* (*Mezoneuron kauaiensis*) and the *koai‘e* (*Acacia koaia*), the resonant clubs made of the resilient kauila (Alphitonia ponderosa) trees which grow at Pu‘ukapele (Kaua‘i); my expertise covers all manner of war club fighting . . . and protecting myself from the top of my head to the bottoms of my feet.”

‘Ūpēloa then told Ka-Miki, “If you could truly escape from my club, your knowledge would be great, beyond compare. But coming here with this boasting, you are full of deceit and impertinence like no other, and you will not be spared from my club.”

Pi‘ikea then went to the edge of the *kahua*, and asked ‘Ūpēloa to wait a short time before fighting so that he go get his club for Ka-Miki to use. ‘Ōpēloa responded, “No! You are not his teacher, you are not the alternate for this errant youth, that you should give him your club. He says that his hands and fingers are adequate. Unless you wish to be his *moepu‘u* (death companion) you will stop this waste of time. Pi‘ikea if you are stubborn about it you and this youth shall both be the pigs which quench the fires of the *imu* today.” Ka-Miki called to Pi‘ikea, “I greatly appreciate your consideration, but it has been taken as a waste of time. With that, ‘Ūpēloa leapt to attack Ka-Miki in the manner of *Ka-piko-o-Wākea*, thinking that he would strike Ka-Miki with the blow. Ka-Miki leapt over ‘Ūpēloa and struck his hand. Because of the force of this blow, ‘Ūpēloa lost his club and it flew to Maka-‘iole who caught the club and held it.

‘Ūpēloa moved to attack Maka-‘iole, but Ka-Miki leapt in front of ‘Ūpēloa and commanded him to back off and maintain the requirements of the contest. ‘Ūpēloa did not heed the command because he was so outraged, and he reached to grab Ka-Miki, thinking to break him into little pieces. Ka-Miki then stepped behind ‘Ūpēloa and grabbed him by the thighs. He then picked ‘Ūpēloa up and threw him from the arena before Maka-‘iole and Keahialaka. Keahialaka then grabbed ‘Ūpēloa and bound him. Ka-Miki then called out to ‘Ūpēloa with a place name saying that commemorates his name to this day:

> *Ka manu o Kaupe ‘a ke ‘ope ‘ope ala i ka u/u hala o ‘Ūpēloa e* - The bird of Kaupe‘a (‘Ūpeloa himself) is all bundled up like the pandanus which grows at grows at ‘Ūpēloa.

Waiākea heard that ‘Ūpēloa had been defeated and was greatly surprised that his war counselor and war club fighting expert had fallen. Waiākea then called to his messenger Kapunakō to go get Kaūmana the foremost teacher of *lua, ha ‘iha‘i, kākā la‘au* (bone breaking fighting, and spear fighting), and all manner of fighting and bring him to the *kahua*. Upon arriving before his chief, Kaūmana asked Waiākea to send his messenger Kapunakō, to bring Kalanakāma‘a, Kaūmana's foremost student to join him at the *kahua* of Kalepolepo.

(The land of) Kalanakāma‘a was named for Kalana-kāma‘a-o-uli, the foremost *‘olohe* student of Kaūmana, and champion of Waiākea. Kalanakāma‘a was the ward of Kīpuka‘āhina (k), Hale-aloha (w) and Hale-loulou (k)], who dwelt above Hilo at Kipuka‘āhina.

When Kapunakō arrived before Kīpukaʻāhina, he spoke about the great rains and rivers of Hilo; a poetic reference to the many skilled which Hilo was famed. It was in this way that Kapunakō described the overwhelming skills of Ka-Miki and his victory over ʻŪpēloa. Kīpukaʻāhina then asked—*ʻōlelo noʻeau:*

Māmā Hilo i ka wai? - Is Hilo (without) lightened of its water?

Kapunakō responded—*ʻAe māmā Hilo i ka waiʻole, ua-kau i ka lani lea holo (wa 'a) ua o Hilo, na ka Mālualua e kiʻi ala; pulu ka liko o ka lehua a me ka māmane*!—Indeed one can move swiftly through *Hilo,* for the streams are without water, the water trough (i.e., the clouds) of Hilo are set in the heavens, it is the *Mālualua* which fetches moisture for the budding *lehua* and *māmane.*

Kīpukaʻāhina then asked in amazement—*Nawai e nele o Hilo i ka wai? He lau ka puʻu, mano ka ihona, he kini nā kahawai o Hllo, e ʻau i ka wai o Hilo a pau ke aho*! - Who could possibly make Hilo destitute of water? There are 400 hills, 4,000 places to descend, and 40,000 streams to cross, indeed one is worn out swimming through the waters of Hilo!

It was in this way that Kīpukaʻāhina learned that a master *ʻolohe* had come to Hilo challenging it's many *ʻolohe.* Using his *ipu hōkiokio* (gourd nose flute), Kīpukaʻāhina awakened Kalanakāmaʻa, for this was the only way in which Kalanakāmaʻa could be safely awakened, or he would kill who ever awakened him.

Kalanakāmaʻa joined his teacher Kaūmana, and met with the assembly at Kalepolepo. Carrying his club *Pūpū-kani-oe-i-ka-ua-o-Hilo* (Land snail singing in the rain of Hilo), Kalanakāmaʻa entered the *kahua* with Kaūmana and a great cry arose praising the abilities of these Hilo champions. Ka-Miki and Kalanakāmaʻa exchanged taunts, Ka-Miki stated that Kalanakāmaʻa would become the *kāmaʻa lau-ʻi i hili kaunaka ʻia* (twined ti leaf sandals) which Ka-Miki wears upon his feet. Outraged, Kalanakāmaʻa leapt to attack Ka-Miki with his club *Pūpū-kani-oe-i-ka-ua-o-Hilo,* Ka-Miki leapt out of the way, and took ʻŌpēloa's club from Maka-ʻiole. Seeing his student miss, Kaūmana called out to Kalanakāmaʻa telling him how to strike Ka-Miki – *ʻolelo noʻeau:*

> *Kau i ka lani ka holoua o Hilo, hilo ʻia i ke aho a ka ua he ʻIo ka hauna lāʻau e kiʻi ai, aʻohe wahi pāʻole, pā ma ke poʻo a hōʻea i nā wāwae, pā no pau ka ʻoni, ʻoni no he aīwaiwa ia, he hialōloa no ka naele, alaila hoʻi hou ka hauna laʻau a ke koa kua makani.*—Placed in the heavens is the water trough of Hilo, entwined in the cordage of the rains, *ʻIo* (Hawk) is the war club strike to use, for there is no place that can't be hit. Strike at the head and reach to the feet, for once struck, there will be no movement. If there is any movement, he is indeed a skilled expert of the depths (deepest knowledge), then return and strike again in the manner of the wind swept koa tree.

Ka-Miki then attacked Kalanakāmaʻa and quickly over came him, Kaūmana then leapt to the *kahua* and was beaten as well. After Ka-Miki defeated Kaūmana, word spread throughout the region, and Piʻihonua, Waiākea's brother called his council together wondering how they might help regain the honor of Hilo from this stranger.

Hanakāhi told Piʻihonua that it would be best not to fight, Piʻihonua then said that perhaps it had been a mistake to honor Hanakāhi with his title as champion, and marriage to ʻOhele. Hanakāhi told Piʻihonua all of the things that *Nā-Mauʻu-a-Pāʻao* had told Piʻikea about Ka-Miki, and said it would be unwise to compete, and thus leave all of the champions of Hilo in disgrace.

Hanakāhi himself was a master *ʻōlohe* trained by Maulua of Hilo-Palikū, he was skilled in *kākālāʻau* (spear fencing), *pololū* (long spear fighting), *ihe laumeki* (barbed spear fighting), and all manner of knowledge. Hanakāhi told his chief, "It is my desire to go before them (Ka-Miki *mā),* not in the manner of a competitor, but in the spirit of

> friendship, and to learn from them the things which they have been taught by their teachers. If I succeed, I will be the foremost *‘ōlohe* of all Hilo, and I will serve as their guide as they journey from one border of Hilo to the next border of Hilo.” Hanakāhi then asked his chief, “Do you agree?” Pi‘ihonua told Hanakāhi to go and compete first, then if he was securely bound to surrender and ask for friendship.
>
> Hanakāhi approached Kalepolepo, and the contest between Ka-Miki and himself was announced. *‘Ōka‘a .lā‘au* (club-spear fighting) was selected as the method of fighting, and when Hanakāhi asked Ka-Miki, “How shall the victory be determined?” Ka-Miki said, “By the breaking of one’s spear.”
>
> Ka-Miki greatly admired the nature of Hilo-Hanakāhi, and as they competed, Ka-Miki dodged each of the thrusts. To those gathered at the *kahua*, it was as if Ka-Miki was the teacher and Hilo-Hanakāhi was the student. Hilo-Hanakāhi tried each technique he had learned from his teacher, but was unable to score against Ka-Miki. Worn out, Hilo-Hanakāhi collapsed and was taken off of the *kahua*, borne in a net. Hilo-Hanakāhi acknowledged the nature and skills of Ka-Miki and surrendered to him, thus *ke ‘ahi kananā* (the fierce tuna fish) of Hilo befriended Ka-Miki *mā* upon the *kahua*.
>
> Hilo-Hanakahi returned to the chief Pi‘ihonua and they spoke of the events which had taken place at Kalepolepo. Pi‘ihonua then sent his messenger to invite Ka-Miki *mā* to his compound in the manner of *aikāne* (companions). Ka-Miki *mā* were well hosted by Pi‘ihonua, and Ka-Miki asked Hilo-Hanakāhi to accompany them to the border of Hilo and Hāmākua at Ka‘ula. Thus Hilo-Hanakāhi traveled with Ka-Miki *mā* through out the rest of Hilo. (Maly 1996a:11-14)

The earliest historical knowledge of Hilo comes from the writings of Kamakau (1961) of a 16th century chief ‘Umi-a-Liloa (son of Liloa) who at that time ruled the entire island of Hawai‘i. Descendants of ‘Umi and his sister-wife were referred to as “Kona” chiefs, controlling Ka‘ū, Kona, and Kohala, while descendants of ‘Umi and his Maui wife were “Hilo” chiefs, controlling Hāmākua, Hilo, and Puna (Kelly et al. 1981). According to Kamakau (1961) both sides fought over control of the island, desiring access to resources such as feathers, *māmaki* tapa, and canoes on the Hilo side; and *wauke* tapa, and warm lands and waters on the Kona side (c.f. Kelly et al. 1981).

Sometime near the end of the 16th century or early in the 17th century, the lands of Hilo were divided into *ahupua‘a* that today retain their original names (Kelly et al. 1981). These include the *ahupua‘a* of Pu‘u‘eo, Pi‘ihonua, Punahoa, Pōnohawai, Kūkūau and Waiākea (Figure 4). The design of these land divisions was that residents could have access to all that they needed to live, with ocean resources at the coast, and agricultural and forest resources in the interior. However, only Pi‘ihonua and Waiākea provided access to the full range of resources stretching from the sea up to 6,000 feet along the slopes of Mauna Kea (Kelly et al. 1981).

Historical accounts (McEldowney 1979) indicate that much of Hilo area was in a zone of agricultural productivity. As Isabella Bird recorded upon arriving in Hilo in 1873:

> Above Hilo, broad lands sweeping up cloudwards, with their sugar cane, *kalo*, melons, pine-apples, and banana groves suggest the boundless liberality of Nature. (Bird 1964:38)

Handy et al. (1991) also describe the region as an agricultural area:

> On the lava strewn plain of Waiakea and on the slopes between Waiakea and Wailuku River, dry taro was formerly planted wherever there was enough soil. There were forest plantations in Panaewa and in all the lower fern-forest zone above Hilo town along the course of the Wailuku River. (Handy et al. 1991:539)

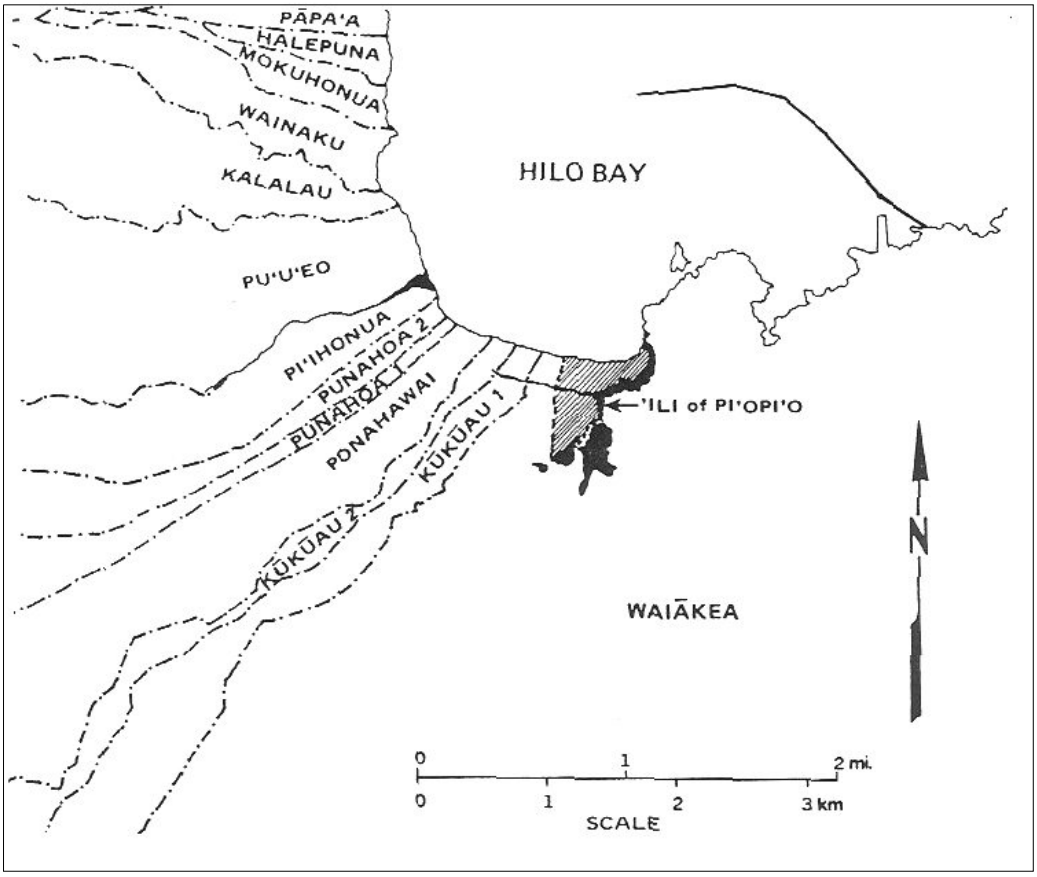

Figure 4. Hilo Bay showing *ahupua‘a* (from Kelly et al. 1981).

Maly (1996b) refers to a 1922 article from the Hawaiian Language newspaper, *Ka Nupepa Kū‘oku‘a*, where planting on *pāhoehoe* lava flats is described:

> There are *pahoehoe* lava beds walled in by the ancestors in which sweet potatoes and sugar cane were planted and they are still growing today. Not only one or two but several times forty (*mau ka‘au*) of them. The house sites are still there, not one or two but several times four hundred in the woods of the Panaewa. Our indigenous bananas are growing wild, these were planted by the hands of our ancestors. (Maly 1996b:A-2)

Hilo was one of the larger population centers on the Island of Hawai‘i, and also an area frequented by the *ali‘i* (Moniz n.d.). Captain George Vancouver, an early European explorer who met with Kamehameha I at Hilo Bay in 1794, recorded that Kamehameha was there preparing for his invasion of the neighbor islands, and that Hilo was an important center because his canoes were being built there (Moniz n.d.:7). Desha wrote that “It is thought that there were as many as seven *mano* [twenty eight thousand] people who gathered at the shore at Kaipalaoa when the *ali‘i* landed in their regal garments.” (2000:369). The people of Hilo had long prepared for Kamehameha’s arrival and collected a large number of hogs and a variety of plant foods, to feed the ruler and his retinue. Kelly et al. (1981) surmise that the people of Hilo had actually prepared for a year prior to Kamehameha’s visit and expanded their fields into the open lands behind Hilo to accommodate the increased number of people that would be present. Kelly et al. (1981) also speculate that many of the fishponds in Waiākea were created to feed Kamehameha, his chiefs, and craftsmen. The area at Hilo Bay that housed Kamehameha’s canoe fleets continues to be the site of canoeing, both recreational and competitive.

From at least Kamehameha I's time (late 1700s-early 1800s) a trail ran from above the cliffs of Hāmākua to, and along the shore of Hilo Bay. It was the main road of the time, the *ala loa* that linked communities. Early written accounts (see McEldowney 1979) describe an unwooded "plain" above Hilo extending to about 1,500 feet, or the forest line. Such accounts describe an open parkland with occasional, widely spaces homes, neat gardens and small clusters of trees. The same plantings as at the coast continued upland, with the addition of greater amounts of dryland *kalo* and bananas. Kipikipi (irrigated *kalo* fields) and fishponds sat along the Waiolama and Wailoa streams near coastal homes, and between Waiākea Pond and the Panaewa forest stood stands of *kukui*, *hala* and mountain apple (Cordy 2000).

In the 1800s, there were numerous and rapid changes in the Hilo Bay area. In its first two decades, sandalwood was being cut and then shipped from Hilo Bay. In the 1820s-30s and beyond, missionaries arrived and settled. By at least 1824, whaling ships were arriving at Hilo Bay. Whaling captains stopped at Hilo for supplies and at times even left their wives in Hilo until they returned. The missionary William Ellis estimated that in 1823 about 2000 people lived in 400 houses or huts along the coastline at Hilo Bay. He described settings of native houses and garden plots interspersed with shady groves of trees – mostly *ulu* and coconut. Gardens were primarily planted with dryland *kalo*, as well as sweet potato and minor vegetable crops, and were bordered by windbreaks or small plantations of banana, sugarcane and *wauke*. Other traditionally cultivated crops noted as growing near the coastline include wetland *kalo*, *kukui*, *hala* and *ki* (Ellis 1963:229). Missionary presence in Hilo increased, and in 1836, David and Sarah Lyman established the Missionary Hilo Boarding School on Haili Street in Punahoa Ahupuaʻa.

In 1848, a measles epidemic began in Hilo and spread throughout Hawaiʻi Island. This was followed by a smallpox epidemic in 1853. These led to a significant demise in the native population and the consolidation of the dispersed settlements along Hilo Bay into a village area of predominantly wooden structures along the northern half of the bay. The main pier near the mouth of the Wailuku River (at the bottom of Waiānuenue Ave) was built in about 1863 and became a focal point for this community's trade and commerce. During this time Hilo Bay was ranked as the third most frequented port for whaling vessels in need of repair and re-provisioning.

By 1870, three *heiau* in Hilo – Kaipalaoa, Kanowa/Kanoa, and Honokawailani – were described as already being "ruins" (Kamakau 1992:145). Lydgate describes the Hilo bay front area as it looked in 1873:

> The sea at that time came right up to the bank edge of Front street, so that in heavy weather the spray blew more or less up into the street. Along Front street tall coconut trees of great age towered up over the street. From the foot of Church street extending along the beach it was open country, with the exception of one Hawaiian home, one canoe-builder's workshop – or halau, as it is called by the Hawaiians – and a tumbled down little blacksmith shop some distance farther on. (Lydgate 1922:102)

By 1874, Hilo ranked as the second largest population center in the islands, and within a few years shortly thereafter Hilo with its fertile uplands, plentiful water supply, and good port became a major center for sugarcane production and export. With its foundations in the Missionary Hilo Boarding School, commercial sugarcane cultivation and sugar production became the central economic focus for the Hilo area lasting until the 1970s. The Waiākea Mill Company, in operation between 1879 and 1948, with thousands of acres of cultivated fields, established its mill operation at Wailoa Pond in Waiākea Ahupuaʻa. The importation of contract labor from China in 1852, from Portugal in 1878, and from Japan in 1885 led to the formation of Hilo's multi-ethnic character.

With the introduction of electricity in 1895, the annexation of Hawaiʻi to the United States in 1898, and the granting of territory status in 1900, Hilo was designated the center of county government in 1905 and continued to be the second most populated city in the newly formed Territory of Hawaiʻi. Sugar continued to be the island's big industry and Hilo was an important shipping hub. Improvements to Hilo Bay as a protected anchorage and Harbor began in 1908 with the construction of the Hilo breakwater (Figure 5), which was completed in 1929. Railroad lines (first built in 1899) carried the sugar to the harbor, where the first Kūhiō Wharf pier was built between 1912 and 1916. A second was built in 1923 **(**Lang 2007:17). Sugar cultivation brought dramatic changes to the Hilo area. Some of its large fishponds (Hanalei, Kalepolepo, Mohouli, Waiāhole, and Hoakumau) were filled and thus destroyed. Many old residences, burial sites, trails, *heiau*, and more were destroyed by the development of sugar plantation fields.

Figure 5. Hilo breakwater shortly after it was completed in 1929 (from Lang 2007:98).

An April 1, 1946 *tsunami*, caused by a major earthquake off the Aleutian Islands, hit Hilo Bay and had a devastating impact on lives, residences and business along the coastline. It demolished much of the railroad tracks (which had been destroyed by *tsunami* before, in 1923, and rebuilt), as well as the railroad station. This time however, the railway was not rebuilt. As a result, Hawaii Consolidated Railway went out of business and a new motor vehicle transportation route was built on top of some of the existing rail bed extending to the Hāmākua Coast (Lang 2007:23).

Hilo sampans provided public transportation in Hilo. They were colorful, open-sided jitneys that were usually family-owned, and operated as inexpensive transport for more than 50 years. The last went out of service in the mid-1970s (Lang 2002:2).

What follows below is a discussion of the specific historical and cultural characteristics of each of the project area's *ahupua‘a* from west to east.

Pi‘ihonua

At the western end of the study area, Pi‘ihonua is bordered to the west by the sometimes-raging Wailuku River, which translates to "Water of Destruction" and which, before the time of modern bridges, presented a rather formidable barrier between the people of the Hilo Bay area and their neighbors to the north.

In 1823, when the Missionary William Ellis circumnavigated the island, he described the markets that had until recently been held along the Wailuku River, which were traded at by people from as far away as Puna and Ka‘u. Ellis noted that the markets ended when Liholiho came to rule in 1819.

> Makoa and the natives pointed out a square rock in the middle of the stream, on which, during the reign of Tamehameha, and former kings, a toll used to be paid by every traveller who passed over the river.
>
> Whenever any one approached the stream, he stood on the brink, and called to the collector of the toll, who resided on the opposite side. He came down with a broad piece of board, which he placed on the rock above mentioned. Those who wished to cross met him there, and deposited on the board whatever articles had been brought; and if satisfactory, the person was allowed to pass the river. It did not appear that any uniform toll was required; the amount, or value, being generally left to the collector.

> The natives said it was principally regulated by the rank of number of those who passed over.
>
> In order the better to accommodate passengers, all kinds of permanently valuable articles were received. Some paid in native tapa and mats, or baskets, others paid a hog, a dog, some fowls, a roll of tobacco, or a quantity of dried salt fish. (Ellis 1963:229)

D.H. Hitchcock described the dangers of crossing the Wailuku River when traveling north from Hilo along the "Laupahoehoe Trail," which followed the line of Jail Street [today Kinoʻole Street] and led down into the riverbed.

> Here the stream rushes, when in ordinary water, through two narrow channels and then leaps over a fall of ten to fifteen feet. Across these were laid foot wide planks on which pedestrians could cross on foot. Horses had to swim across some distance above and their trappings were carried across the planks, or as was sometimes the case, taken down to near the mouth of the river and there swum across to the Puueo shore. The crossing on foot wide planks, with the rushing waters beneath tearing through these narrow channels, was very precarious, and especially so when the planks were muddy and slippery. Some lives had been lost by the slipping of travelers from the planks. Once in the stream, which ran with the velocity of a millrace, life was gone. (Hitchcock 1897, cited in Lang 2007:85)

The river's first suspension bridge was built in 1866 and collapsed less than two months later. A number of people on horseback, including *Two Years Under the Mast* author Richard Dana, were crossing at the time and were "fished out" by Hawaiians (Lang 2007:20).

Pinao Heiau stood at the west corner of Ululani Street and Waiānuenue Avenue in Piʻihonua, though no trace of it remains (Stokes and Dye 1991). Kaipalaoa Heiau, another *heiau* no longer in existence, is thought to have stood just west of Isabelle Point (the old name for that point was Kaipalaoa) (ibid).

The historically and culturally significant Pinao and Naha stones, now stand in front of the Hilo Library on Waiānuenue Avenue. The Pinao stone is said to be from the former Pinao Heiau, and the Naha stone is, according to tradition, the one Kamehameha lifted after it was prophesied that the chief who lifted that enormous stone would rule all the islands (Lang 2007:110).

While Kamehameha I was fighting at Nuʻuanu, the *kapu* chief Namakeha (a chief from Maui) made trouble at Hilo, and so in 1796, Kamehameha made war on Namakeha and his followers there. Namakeha was defeated and hid, but when found in January of 1797 he was reportedly sacrificed at Kaipalaoa Heiau (Kamakau 1961).

Piʻihonua was also the site of a story Kamakau tells of Kawau, a "hunchback" and lesser chief of olden times, who returned from fishing one day and saw the surf called Huia off Piʻihonua and Punahoa. According to Kamakau, Kawau chanted about the great waves from Kahiki and other far-off lands: "*Kū mai, kū mai, kū mai*" – "Arise, arise, arise." The chant then speaks of the Polynesian islands from where the waves come, and concludes, "*Hoehoe Pae; pae au la*." "I will paddle until I reach shore; I have landed" (Kamakau 1991:116-117).

Both whalers and missionaries, who overlapped in time, influenced the early culture of the Hilo area. Between 1863 and 1890, landing wharves were built at the foot of what is now Waiānuenue Avenue (in Piʻihonua Ahupuaʻa) to aid in the ocean transport of goods and passengers. D.H. Hitchcock built the first one with Sheriff Coney. Later, Hitchcock wrote that their "little wharf was a vast improvement on the old style of running the boats up onto the sand beach and transferring passengers and goods from them to dry land on the backs of the stalwart boat boys, stripped to their *malo*'" (Lang 2007:86).

Nineteenth-century Waiānuenue (in the latter part of the century, a dirt, horse-and-buggy road so named because it led to the "Wai Ānuenue" [Rainbow Falls]) had wide drainage ditches in front of its

homes, which, as today, were on both sides of the street. The ditches drained water to the ocean. (Lang 2007:26, 115). At its base, as today, Waiānuenue Avenue was a commercial area of shops including the Hilo Drug Company, which opened in 1896 at the corner of Kamehameha and Waiānuenue Avenue. In 1890, most of the homes above Pitman Street (now Kinoʻole St.) were still grass *hale* (Lang 2007:26, 31).

The railroad depot (also site of the town's first post office) stood near the *makai* end of Waiānuenue Avenue, across from the present Koehnen Building, between Waiānuenue Avenue and Shipman Street. The railroad transported both sugar and passengers from Hāmākua and Puna mills to Hilo harbor until it was destroyed by the 1946 tsunami. (Lang 2007:6). Before the 1946 tsunami, businesses lined both sides of Kamehameha Avenue. The *makai* row of buildings was not rebuilt (Lang 2007:44).

Punahoa

Punahoa literally translates as "companion spring" (Pukui et al. 1974:194), a moniker which no doubt relates to the many fresh water sources in the Hilo area. At the time of the *Māhele* of 1848 Punahoa was divided into 2 parts, Punahoa 1 and Punahoa 2. An archaeology study conducted by the Bishop Museum in the late 1970s (Sinoto 1978) identified old *ʻauwai*, terraces, rock mounds and modified stream beds within the inland portions of Punahoa 1. Maly (1996a:39) also suggests that "a small *heiau hoʻoūlu ʻai* (a temple at which ceremonies were offered to ensure successful harvests)," named Kiniakua and referenced by both Thrum (1907) and Hudson (1932) to have been situated near the spring of Waikapu, was perhaps located in Punahoa.

Kamakau (1961:130) writes of the 1773 Hilo chief Keawe-hano, whose houses were "situated on the beach at Punahoa, close to Piʻihonua and facing the waves of Huia and Kihanui." Kamakau recounts that when a lesser chief named Ka-pohu went to Keawe-hano's house, he stood outside the fence and saw Keawe-hano and Ka-ʻakakai sitting "at the threshold of the house, both wearing feather capes on their shoulders, feather necklaces about their necks, and helmets on their heads" (ibid).

In the 1832, the Lyman missionary family settled in Punahoa in a wooden frame house, which still stands on what is now Haili Street as part of the Lyman Memorial Museum. Then in 1836, the missionary David Lyman and his wife Sarah opened the Hilo Boarding School, formerly located near the present day Hilo Boys and Girls Club on Haili Street. Their "goal was to educate Hawaiian boys in the ways of industry and morality, and to be a preparatory school for Lahainaluna High School on Maui (Lang 2007:57). As part of the curriculum, students cultivated various food crops and sugarcane, and ran a tailor shop, dairy, and blacksmith (ibid.). Perhaps one of the first vocational training schools in the United States territory, it operated until 1925.

As its name indicates, water was always a significant aspect of Punahoa, and the first ditch excavated in Hilo to carry fresh water from *mauka* to *makai*, is identified as having been ordered by a Hilo chief named ʻI, at a time well before that of Kamehameha I. This ditch ran "close to Puuhonu [one of the Hilo Hills], on the Pueo [Hamakua] side, and …went right straight down to the foot of Waianuenue Street" (Kelly 1982:10). Prior to this, residents generally got their water from the Wailuku River.

After Kamehameha I united the islands, he ordered a channel dug from the ʻI ditch, which started some distance above the old Hilo Hotel towards Waiānuenue Avenue and, along with the ʻI ditch, supplied water to the government buildings located between what is now Keawe and Kinoʻole Streets (Kelly 1982:10).

Another significant waterway was the ditch dug by the Hilo Boarding School to bring water from the Wailuku River to power an electric generator, which provided electricity for about a dozen lights in the study hall and in the principal's cottage. A little later, the school used that electricity to start an ice plant. In 1895, the Boarding School Ditch was generating commercial electricity to Hilo via the specially formed Hilo Light Co., Ltd., which began in 1895 (Kelly 1982:9).

Ponahawai

The name Ponahawai literally translates as "water circle" (Puku'i et al. 1974:189). A prominent landform within Ponahawai are the Hāla'i Hills (cinder cones formed during an older than 10,000 year Mauna Loa volcanic event). The three Hāla'i hills are called Hāla'i, 'Ōpe'ape'a and Pu'uhonu. In various traditional accounts, the Hāla'i Hills are associated with the demigod Maui and his goddess mother Hina; it is said that Hina, lived in a cave in the nearby Wailuku River beneath Rainbow Falls. Hina gave the Hāla'i Hills to her daughter Hina Ke Ahi (or Hina-i-ke-ahi). Hina is said to have saved her people during a drought by ordering them to dig an *imu* (earth oven), and then getting into the *imu* and lighting the fire:

> She then sank into the underworld and became a gushing stream. On the second day she emerged as a pool near the sea, and on the third day a spring burst forth. She washed herself and returned to the oven, ordering her people to open it. They found abundant food (Kelly 1982:8).

Another significant landscape feature of Ponahawai was the Waiolama marsh area just inland from the Hilo shoreline. This marsh area was also developed into a fishpond and was used for a unique type of Hawaiian cultivation (*kipi*), a practice whereby *kalo* was grown in mounded organic rafts that were floating in the marsh. The only other places in the Hawaiian Islands where this type of *kalo* cultivation was known to be practiced was at Hā'ena, Mana, and Wai'eli on Kaua'i (Handy et al. 1991:419). The *ali'i* Ruth Ke'elikolani had a house near the bay at Waiolama, and spent time there during her well-known 1880-81 visit to Pele, at which it was said she successfully stopped an advancing lava flow when it was less than 2 kilometers from Hilo Bay (Kelly et al. 1981).

In 1889, a small canal was dredged to divert some of the water from the Waiolama Marsh into the Wailoa River. The drainage canal was enlarged and paved between 1915 and 1917, and beach sand was pumped into the low-lying lands of the Waiolama, filling in the remains of the "taro beds" at Ponahawai (Kelly 1982).

Commercial sugarcane cultivation had begun in Ponahawai by at least 1839, under the direction of Governor Kuakini. In 1840-41, the mill produced about 30 tons of sugar. Near the lower end of the Alenaio Stream was the Hawaii Mill, built in the 1880s (Kelly et al. 1981).

Kūkūau

According to Pukui et al. (1974:121) Kūkūau is named for a type of shore crab. At the time of the *Māhele* of 1848, Kūkūkau was divided into Kūkūau 1 and Kūkūau 2, although the total size of the *ahupua'a* is small, similar to Ponohawai. One legendary account perhaps metaphorically describes the similarity between Ponahawai and Kūkūau:

> Kukuau and Ponahawai . . . were two girls who came rambling along till they reached Kalalau (the careless idler), the proper name of which is Pukihae (inspiration hill). Searching around they looked down into the stream and saw two girls bathing, and, remarking upon their comeliness, desired to descend and make friends with them. So they started down, but strange to say, on reaching the stream the bathing girls had disappeared. Diligent was the search, but to no purpose; they were not found. Therefore the place was called Kalalau and Wainaku (searched water), on account of the leading astray of Kukuau and Ponahawai in their fruitless search for the nymphs. Ala-pahee was the name of the pond in which the bathing girls were seen. (Thrum 1920:98)

Waiākea

Pukui et al. literally translate Waiākea as "broad waters" (1974:220). Maly (1996a:11) provides the following translation of a traditional account of the *ahupua'a* name:

> The lands of Waiākea were named for the high chief Waiākea-nui-kumuhonua, the brother of Pi'ihonua-a-ka-lani [k] and Pana'ewa-nui-moku-lehua [w]. (Maly 1996a:11)

Ethnographic notes taken by Theodore Kelsey during an interview with Mrs. Kamakakuikalani in 1921 record that "Waiākea was so named 'because you could dig any where and find water'" (Maly 1996a:6). Waiākea is a large *ahupuaʻa* that in former times was referred to as a "food container" due to its rich, extensive system of fishponds, good ocean fishing, and extensive dryland agricultural resources (Iʻi 1959:14). This large land area was divided into several smaller land units, or *ʻili*. The *ʻili* of Waiākea are Panaʻewa, Keaukaha, Pūʻāinakō, Kāwili, Kaleplepo, Piʻiopiʻi, Mohouli, and Kalanakāmaʻa.

In addition to Waiākea being a residential location for Hilo's *makaʻāinana*, the area has long been recognized as a place of chiefly residence. As early as the 16th century, the Hilo chief Kukukuluʻa lived at Waiākea (Kelly et al. 1981). And later, during the reign of Alapai, Iʻi recounts:

> Alapai, ruler of Hawaii [from c. 1730-1754] and great uncle of Kamehameha, and his wife Keaka took charge of him [Kamehameha]. Some years later, Alapai and his chiefs went to Waiolama in Hilo, where Keoua Kupuapaikalani, the father of Kamehameha, was taken sick and died. Before Keoua died he sent for Kalaniopuu, his older half brother and the chief of Kau, to come and see him. Keoua told Kalaniopuu that he would prosper through Kamehameha's great strength and asked him to take care of the youth, who would have no father to care for him. Keoua warned Kalaniopuu, saying, "Take heed, for Alapai has no regard for you or me, whom he has reared." After this conversation, Keoua allowed his brother to go, and Kalaniopuu left that night for Puaaloa [situated in the Panaʻewa portion of Waiākea].
>
> As Kalaniopuu neared Kalanakamaa [in Waiakea], he heard the death wails for Keoua and hastened on toward Kalepolepo [between Mohouli and Kawili] where he had left his warriors, There they were attacked by Alapai's men, who had followed Kalaniopuu from Hilo. First the warriors from the lowland gained, then those from the upland . . . Kalaniopuu continued his journey and at midnight reached Puaaloa, where he arranged for the coming battle. The next day all went as he had planned, his forward armies led the enemy into the forest of Paieie, where there was only a narrow trail, branchy on either side and full of undergrowth. There his men in ambush arose up against the enemy warriors, and his rear armies closed in behind them . . . When news reached Alapai that his warriors had been destroyed, he sent another company of warriors to meet Kalaniopuu at Mokaulele on the outer road, which was an ancient road, known from the time of remote antiquity. (Iʻi 1959:3-4)

Kamakau adds:

> . . . Keoua, called Ka-lani-kupu-a-pa-i-ka-lani-nui, fell ill of a lingering sickness at Piʻopiʻo adjoining Wailoa in Waiakea and died there in 1752 . . . His older brother Ka-lani-opuu was with his *kahu* Puna above Kalepolepo at the time. (Kamakau 1961:75)

Maly provides further confirmation of the relationship between Waiākea Ahupuaʻa and Hawaiʻi's *aliʻi nui*:

> In c. 1790, a dispute arose between Keawemauhili and his nephew Keōua, and Keōua attacked and killed Keawemauhili. Kamakau reports that Keōua divided the lands of Hilo District between his chiefs and warriors, and "the fat Mullet of Waiakea and Piʻopiʻo became theirs: (Kamakau 1969:152). In 1791, Keōua was killed and Kamehameha I retained Piʻihonua, Punahoa, and Waiākea as his personal land holdings in Hilo. Liholiho, or Kamehameha II was born in Hilo in 1797 (Kamakau 1961:260), and because of the value of Waiākea with its agricultural and fishpond resources, Liholiho retained Waiākea until his death in 1824. For a time, a granddaughter of Keawemauhili's, Kaunuohua, held waiākea, but in the Māhele, or Land Division of 1848, Kauikeaouli (Kamehameha III), assumed the rights to Waiākea (Indices of Awards 1929:26). Kauikeaouli retained Waiākea until his death in 1854, the *ahupuaʻa* was among the

> "Crown Lands" which under the monarchy, came to be held in perpetuity by the rulers of Hawai‘i. (Maly 1996a:10)

In 1823, the missionary William Ellis described Waiākea as:

> …the most beautiful we have yet seen….The whole is covered with luxuriant vegetation, and the greater part of it formed into plantations, where plantains, bananas, sugar-cane, taro, potatoes, and melons, grow to the greatest perfection.
>
> Groves of cocoa-nut and breadfruit trees are seen in every direction loaded with fruit, or clothed with umbrageous foliage. The houses are mostly larger and better built than those of many districts through which we had passed. We thought the people generally industrious; for in several of the less fertile parts of the district we saw small pieces of lava thrown up in heaps, and potato vines growing very well in the midst of them, though we could scarcely perceive a particle of soil.
>
> There are plenty of ducks in the ponds and streams, at a short distance from the sea, and several large ponds or lakes literally swarm with fish, principally of the mullet kind. The fish in these ponds belong to the king and chiefs, and are tabued from the common people.
>
> Along the stone walls which partly encircle these ponds, we saw a number of small huts, where the persons reside who have the care of the fish, and are obliged frequently to feed them with a small kind of mussel, which they procure in the sands round the bay.
>
> …There are 400 houses in the bay, and probably not less than 2000 inhabitants…. (Ellis 1963:337-338)

‘Ohele Heiau, a *heiau luakini* (Malo 1951) measuring 60 feet square, stood near the Puna-side shoreline where the Wailoa River enters the ocean, approximately where Suisan Fish Market now stands. This was just above the site of the former Pitman store, and during Pitman's time in Hilo (early- to mid-1800s) ‘Ohele Heiau was already in ruins (Stokes and Dye 1991).

The Kāwili area of Waiākea, bordering the University of Hawai‘i at Hilo, was previously native forest where birds were *kāwili* (ensnared). They were collected both as a food source and also for their feathers, which were used to make ornaments for royalty. An ethnographic text recorded by Kelsey in the early 1920s describes the traditional snaring and trapping of birds. The following was dictated by H. B. Nalimu (the great great great grandfather of Leslie Lang, coauthor of the current study) and transcribed by Kelsey, and more recently translated by Kepā Maly:

> **Snaring and Trapping Birds**
>
> Bird catchers (*kia manu*) of ‘Ōla‘a were people who snared (*‘ahele*) birds. Some with branches and others with *lehua* blossoms. The individual who snared birds among the *lehua* made a snare (lasso) close to the *lehua* flower, the snare was secured there. One end of the line was securely fastened on the branch of the *‘ōhi‘a*. The cord of perhaps five or six fathoms long, extended from the lasso (on the branch) to the man's hand where the end of the line was held tightly. The snare was placed close to a *lehua* blossom, where the bird would step *(kīko‘o)* to the *lehua.* At that time, the man would then pull the end of the cordage and secure the feet of the bird. The man then climbed the tree, took the bird, and he would make the snare there again. The *‘akakane* (*‘apapane*)*;* the *‘i‘iwi*, and the *‘ō‘ō* were caught up in the *lehua*, snared with fine *olonā* cordage. The *‘ō‘ū* bird was snared while it was on the ripe banana fruit.

Preparing Bird Lime to *Kiiwili,* or Ensnare Birds. The bird lime *(kēpau)* is made from the sap of the breadfruit. Cut the breadfruit bark and the white sap flows, and when the sap is dry, say in the evening, the sap is hardened. You go and gather the sap. When enough has been gathered, the sap can be made into bird lime. Then you go and gather some raw *kukui,* removing the shell, you keep its meat. You then go and get the "clover" for making bird lime (*ʻihi-ku-kepau,* the *Nasturtium sarmentosum*), it is a black *pāʻihi,* and you mix it with the raw *kukui.* Then you chew it, and the *kukui* and *pāʻihi* become slimy. This is put into a *wauke* bark cloth (it is a tough piece); then the juice of the *kukui* and *pāʻihi* are squeezed into the *ʻopihi* (shell), it is the "pot" for cooking the broth over the fire. When it starts to boil, the *('ulu)* gum is cut into small pieces and put in the juice of the *kukui* and *pāʻihi* so it can boil. Then get two coconut mid-ribs or perhaps little sticks to stir this boiling juice. This is how it is done until the juice is cooked and becomes the birdlime. It is then place into the empty *ʻopihi* or a ti leaf, wrapped up in ti leaves. Kāwili is in the uplands adjoining Mokaulele. Then go to where there is low branching *ʻōhiʻa (pulu ʻōhiʻa),* where the *pāhoehoe* is below.

You are below on the *pāhoehoe,* and you apply the birdlime around the *lehua* flowers. Now you *kāwili* (twist, i.e. apply) this bird lime in among three or four *lehua* flowers, then when a bird is stuck by one of the *lehua* that blossoms, you free it and it is caught. You then hide again among the low *ʻōhiʻa* branches (a place where the *ʻōhiʻa* tops droop down, that is the *pulu ʻōhiʻa),* and catch another bird. You squeeze the birds head and it is killed. It is placed into a bag. Returning (home) perhaps around three ʻo clock, there are many birds, perhaps forty, twenty, or thirty. Those small birds; when fat----the meat is tasty and sweet. That's how one prepares *kāwili kēpau,* or bird lime to ensnare birds.

SNARING BIRDS ON BRANCHES. The (decoy) branch is perhaps three or four fathoms long. *Lehua* blossoms are placed on this branch, from one side of the branch up to the tip of the branch. Two men do this job, one at one (end of the) branch and one at the other. Bird lime is placed on top of the branch along with many *lehua* blossoms in between this bird lime----this is a bird catchers (*kia manu*) branch _____ [as drawn in manuscript]. ʻŌlaʻa and Piʻihonua are lands of bird catchers. There are many *ʻōʻō* birds at Puʻu ʻŌʻō. It is there that the bird catchers go to get the feathers for adornments (*lei*) of the chiefs. Panaʻewa is also a place of the bird catchers.

The bird catchers (decoy) branch is pulled in between the *ʻōhiʻa lehua* trees. One (person) uses the net. The net is pulled up, one branch is above, one branch is below. It is an open (wide) meshed *olonā* net *(ʻupena olonā maka hakahaka),* and *olonā* cordage at the tip. It is a soft (pliable) net perhaps five, four, or three fathoms long. As the birds fly their feet are caught, or their wings caught. Now if there are one or two birds, they are left, these are the birds that call out to the other birds. When there are many birds the net is let down (the birds taken), then the net is pulled up again. *ʻŌhiʻa* growth is all around. So this is the work of the "bird-fishers," or *lawaiʻa manu.* They return to the house and then remove the feathers of the *manu ʻōʻō.* When the container is filled with feathers, a *lei* is made. Below the wing-pit is where the male *ʻōʻō* bird feathers are, and above on the back by the tail, are the pale yellow feathers. (Maly 1996a:7-8)

Moku Ola (also known as "Coconut Island") means "Island of Health" and is said to have been named for an underwater rock believed to possess healing powers. Along with an area along the adjacent shoreline, Moku Ola was part of a large *heiau* complex that also included a *heiau luakini* and *puʻuhonua* (Lang 2007: 96). In the twentieth century, the Keliʻipio family acted as caretakers of the island. Before the much more recent concrete bridge was erected, they took people to the island by canoe for 5 cents. Some people, to avoid having to pay again, would swim back (Martha Lang 1995, personal communication).

Long ago a system of large, walled-off and spring-fed fishponds was built along the Wailoa River. Some of the fishponds were restricted for *aliʻi* use only, and others were for *makaʻāinana*. The delicious fish of the Waiākea fishpond are referred to in various early accounts, such as a story about when Kamehameha announced his intent to make war on Keawemauhili, who wanted to avoid war and sent Kamehameha the "sweet tasting ʻanae of Waiākea and the fat awa" in the center of the fishpond (Desha

2000:161). Caretakers had small huts alongside the fishponds, from where they guarded the fish from theft or being killed by pigs and dogs (Kamakau 1976:48). Waiākea's fishponds, said to be favorites of Hiʻiaka and Pele, also figured in a story about why the goddess Hiʻiakaikapoliopele caused the deadly ash fall that killed Keōua's army when they passed near the volcano. According to a seer at the time, "the goddess was angry at Keōua for not offering her some of the "fat mullet of Waiākea" (Desha 2000:279).

Between 1824 and 1848 Hilo became a significant center for foreign activities, primarily as a result of the establishment of religious mission stations by American missionaries. The first mission station was established at Waiākea within Piʻopiʻo along the outflow of the Wailoa River. In 1825 Queen Kaʻahumanu gave Punahoa 2 Ahupuaʻa to missionaries and the mission station was relocated. In 1836 and two New England style houses were constructed in the area; however, Native Hawaiian land use practices continued to dominate the Hilo Bay (Figures 6 and 7) area and the Piʻopiʻo portion of Waiākea remained a residential area for Hawaiian royalty.

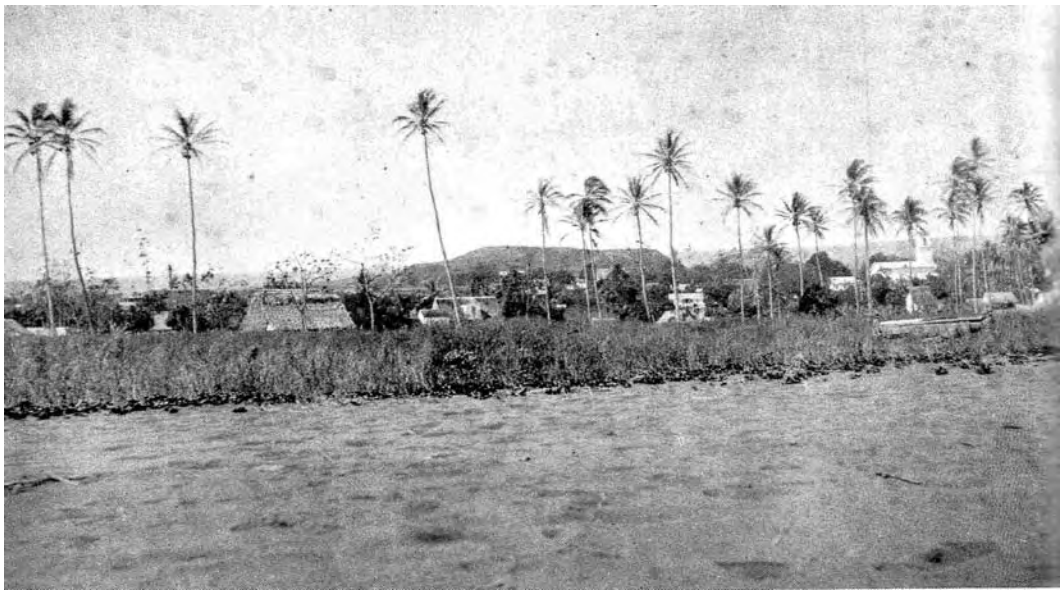

Figure 6. A view of the Hilo bay front during the middle nineteenth century (from Lang 2007:24).

Figure 7. A traditional house of the middle nineteenth century (from Lang 2007:100).

In 1879, the Waiākea Mill Company brought intense sugar cultivation to Waiākea. Its first sugar was planted in 1870 in Waiākea Uka and extended 1,100 feet up Mauna Loa. The Waiākea Mill Company started with about 350 acres of cultivated lands they had acquired from Lyman. In 1888 the company acquired a 30-year lease that increased their land holdings in Waiākea Ahupua‘a. When the lease ran out in 1918 the acreage under cultivation had increased to nearly 7,000; but without a lease the *ahupua‘a* fell under the homesteading laws, which required the government to lease the land to individual growers. Waiākea Mill Company was expected to grind the crop for the independent growers under a contract that gave the company 40% of the proceeds from the sale of the refined sugar. Contractual and legal problems combined with a declining sugar market and the devastating *tsunami* of 1946 led the Waiākea Mill Company to cease operation in 1947. During the 68 years of its operation, the Waiākea Mill Company was a major force in shaping the economic and social growth of Hilo, and certainly left its mark on both the cultural and physical landscapes of the area.

As depicted on a 1918 map (Figure 8), the company lands were divided into house lots, cane lots, and fields. The productive areas were interconnected with a plantation railroad system. The narrow gauge railway was laid out in a dendritic pattern with all lines ultimately feeding into a main line that terminated at the mill site and barge berth at the inland end of the Waiākea Fishpond (Figure 9). Refined sugar was placed on barges that carried the product via the Wailoa Stream to Hilo Bay, where it was loaded onto cargo vessels bound for the U.S. mainland. The Waiākea Sugar Plantation was unique in this fashion as it was one of only two plantations that used barges to haul sugar. A by-product of sugarcane production is bagasse, which the mills used as fuel for their boilers. As commercial fuel oils became increasingly available in the late 1920s, the use of bagasse as a fuel declined. This byproduct of production was then creatively used to manufacture a wallboard product for construction. In 1929, Hawaiian Cellulose Ltd, a subsidiary of the Waiākea Mill Company applied for a patent for this construction product, called canec. By 1932 Hawaiian Cellulose Ltd became known as Hawaiian Cane Products and opened a canec plant close to the site of the Waiākea Mill. Following a series of difficulties, not the least of which was the durability of the product, in 1948 Hawaiian Cane Products was bought out by the Flintkote Company of New York. With the application of stabilizing (toxic) chemicals, canec production flourished until 1960 when a factory fire devastated the operation.

Pineapple was another relatively short-lived commercial venture within Waiākea with plants cultivated in upland Waiākea and a pineapple cannery located where the Hilo Iron Works building now stands. The pineapple growers no doubt took advantage of the sugar plantation roadway and railway systems to get their produce to the cannery.

When Hawaii Consolidated Railway was in operation, its 3-stall wooden “roundhouse,” or locomotive garage, stood in Waiākea on Kalanikoa Street, next to what is now the County swimming pool. In 1920, the original structure was rebuilt as an eight-stall, reinforced concrete, quarter-circle “roundhouse,” though it retained the original turntable that reversed engines into their stalls (Figure 10). This roundhouse still exist, and *makai* of nearby Kuawa Street, the base of the flagpole that stood in front of the Hawaii Consolidated Railway office can still be seen (Lang 2007:12). During the sugar years, railroad tracks ran right into a shed for offloading freight at Kūhiō Wharf, on Pier 1 at Hilo Bay, and where were stored thousands of tons of sugar at a time (Figure 11; Lang 2007:17).

Figure 8. Waiākea Mill Company's 1918 map depicting company land divisions.

Figure 9. Waiākea Mill circa 1940 (from Lang 2007:19).

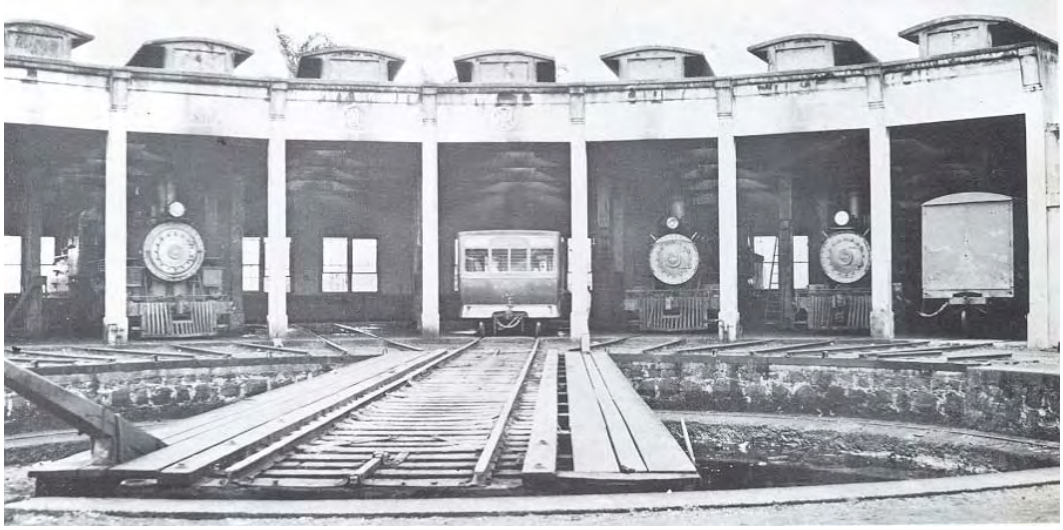

Figure 10. Waiākea turntable and round house in 1946 (from Best 1978:145).

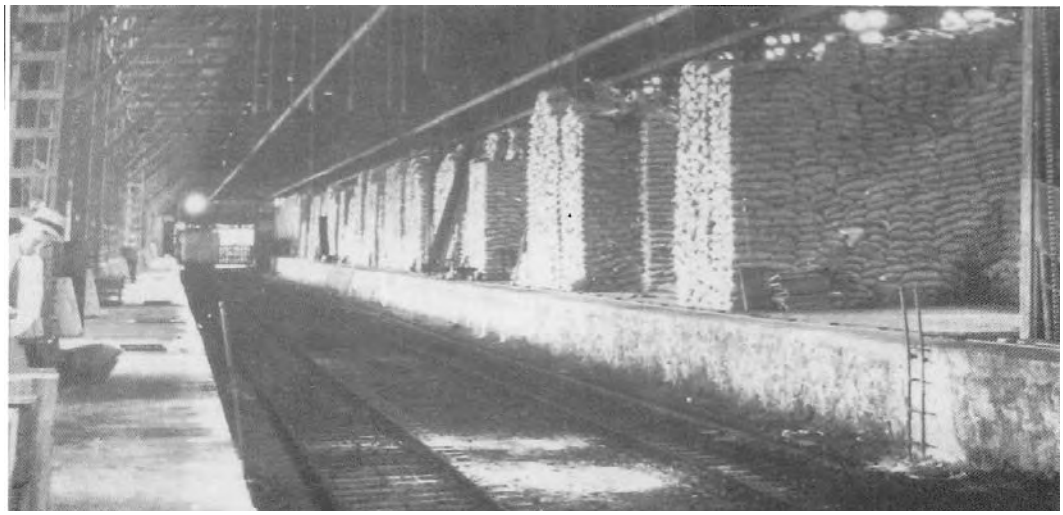

Figure 11. Kūhiō Wharf rail line and warehouse with stacked sacks of refined sugar (from Lang 2007:17).

In 1907, the Suisan Fish Market was built at its present Waiākea location. The company began by hauling fish into Hilo by horse-drawn buggy and selling it from open baskets. Over the years, it opened a *shoyu* and *miso* brewery and a jam/jelly plant, expanded into frozen foods, and began processing guava and other fruit purees. It was known for its long-lived fish auction, though it no longer operates (Lang 2007:32).

Banyan Drive on the Waiākea Peninsula was built in the early 1930s, and soon thereafter banyan trees were planted on both sides of the drive. According to Warshauer (2003, 2004), the first banyan tree was planted in 1933 and the last in 1972 by Mrs. Richard Nixon to replace one that was planted previously and later destroyed in 1952. It is along Banyan Drive that many of the larger hotels in Hilo were constructed.

Accomplished musician, singer and composer Helen Desha Beamer, who raised her family in Hilo, composed the song "Naniloa" for the grand opening of the original Naniloa Hotel built on Hilo Bay in Waiākea in 1940. She noted it was inspired by a dream:

> Naniloa, how majestic you are, Midst nature's green verdure, Bordered by the warm blue sea, Your stately rare *loulu*, Extend to all a welcome, To enjoy the sunshine, The Foundation of Life, *E ō, Naniloa* – Naniloa by the sea, *E ō, Naniloa* – Naniloa by the sea (Ka‘aihue 1991: 38).

Reed's Bay, in the Waiākea area called Keaukaha ("passing current"), was previously known as Kanakea ("wide stream"). A freshwater subterranean spring rises from a large sinkhole and feeds cold water into the bay at a former fishpond now known as the Ice Pond. Railway tracks crossed that pond from about 1916 until 1946, when they were destroyed by a *tsunami* (Figure 12); remnants of the railroad trestle are still visible within and above the surface of the pond (Figure 13).

A legend of Reed's Bay refers to a hole called Kaluakoko beneath the water. A man and a woman lived nearby, and later a second woman came to live with them. The new wife became jealous of the first, and convinced her to go net fishing one day when the husband was fishing, though the husband had forbidden it because it would affect his fishing. As she caught shrimp at the edge of a large hole, the second wife pushed her into the hole and covered the entrance with a rock, killing her. Blood spread through the sea foam and the fisherman, followed its trail in his canoe, moved the stone, and saw what had happened. He confronted the second wife, who lied, and then beat her to death. According to the story, the hole has been referred to as Kaluakoko (the Hole of Blood) (Wolforth 2004).

Pi‘opi‘o

Within Waiākea Ahupua‘a there is a small land division, or *‘ili*, called Pi‘opi‘o that is designated as an *‘ili kūpono*. An *‘ili kūpono* is described as being "a nearly independent *‘ili* division within an *ahupua‘a*, paying tribute to the ruling chief and not to the chief of the *ahupua‘a*" (Lucas 1995:41). Pi‘opi‘o has a long history of being a royal residence. Desha refers to Pi‘opi‘o as "a place of residence of chiefs from ancient times, and mentioned that Keawemauhili's wife Ululani lived there (Desha 2000:76). During Alapa‘inui's reign, Keōua (Kamehameha I's father) died at Pi‘opio, and later Keōua's brother, Kālanaiopu‘u also lived and died at Pi‘opi‘o (Fornander 1996:142, 201). Kamehameha I lived at Pi‘opi‘o after 1791, after which time the *‘ili kūpono* appears to have been given to Ka‘ahumanu. A residence for the Chiefess Ke‘elikolani is shown at Pi‘opi‘o on an 1891 map (Figure 14). Kamakau (1992:15) provides many references to *ali‘i* activities (e.g., *hula*, games of hiding stones (*papuhene)*, and tossing a half-coconut at a mark (*kilu*)) taking place at Pi‘opi‘o.

In about 1900, Shinmachi, which means "New Town" in Japanese, was established along the *mauka* side of Kamehameha Avenue, from Pi‘opi‘o Street to where the Hilo Iron Works building now stands. What had been low-lying swampland was filled with sand from Hilo Bay, and became a close-knit, primarily Japanese community until 1946, when many of its buildings were destroyed by a *tsunami* and more than 100 people died. It was not rebuilt and the area has today become grassy parkland (Lang 2007:36).

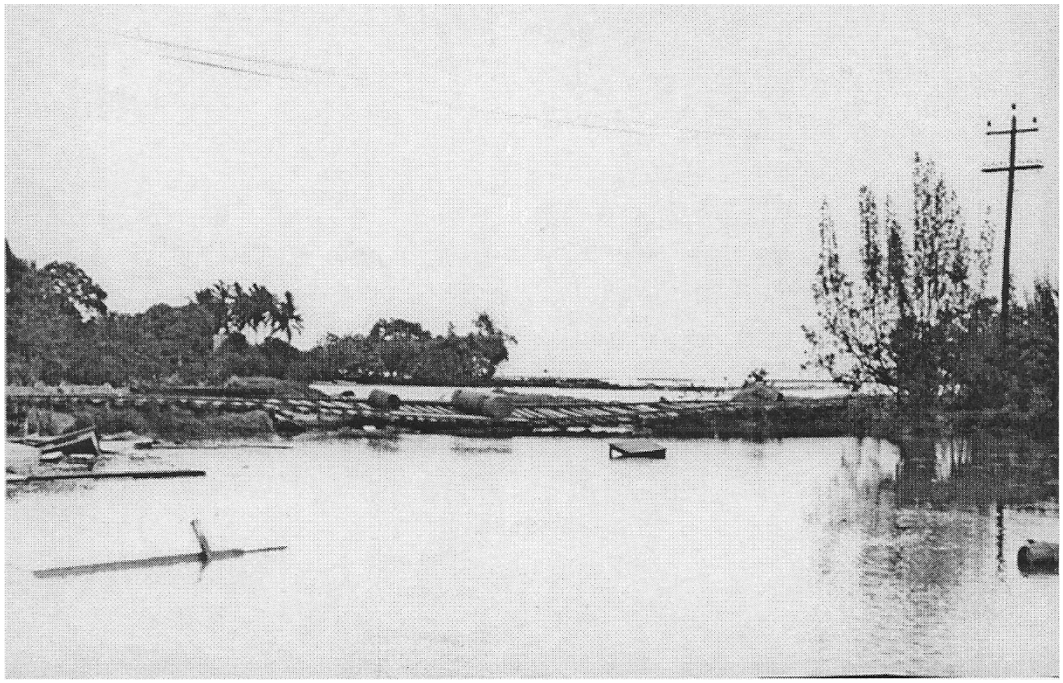

Figure 12. Railway tracks across Kanakea Pond following their destruction by the 1946 *tsunami* (From Wolforth 2004:24).

Figure 13. Modern day remnants of the railroad trestle within the “Ice Pond.”

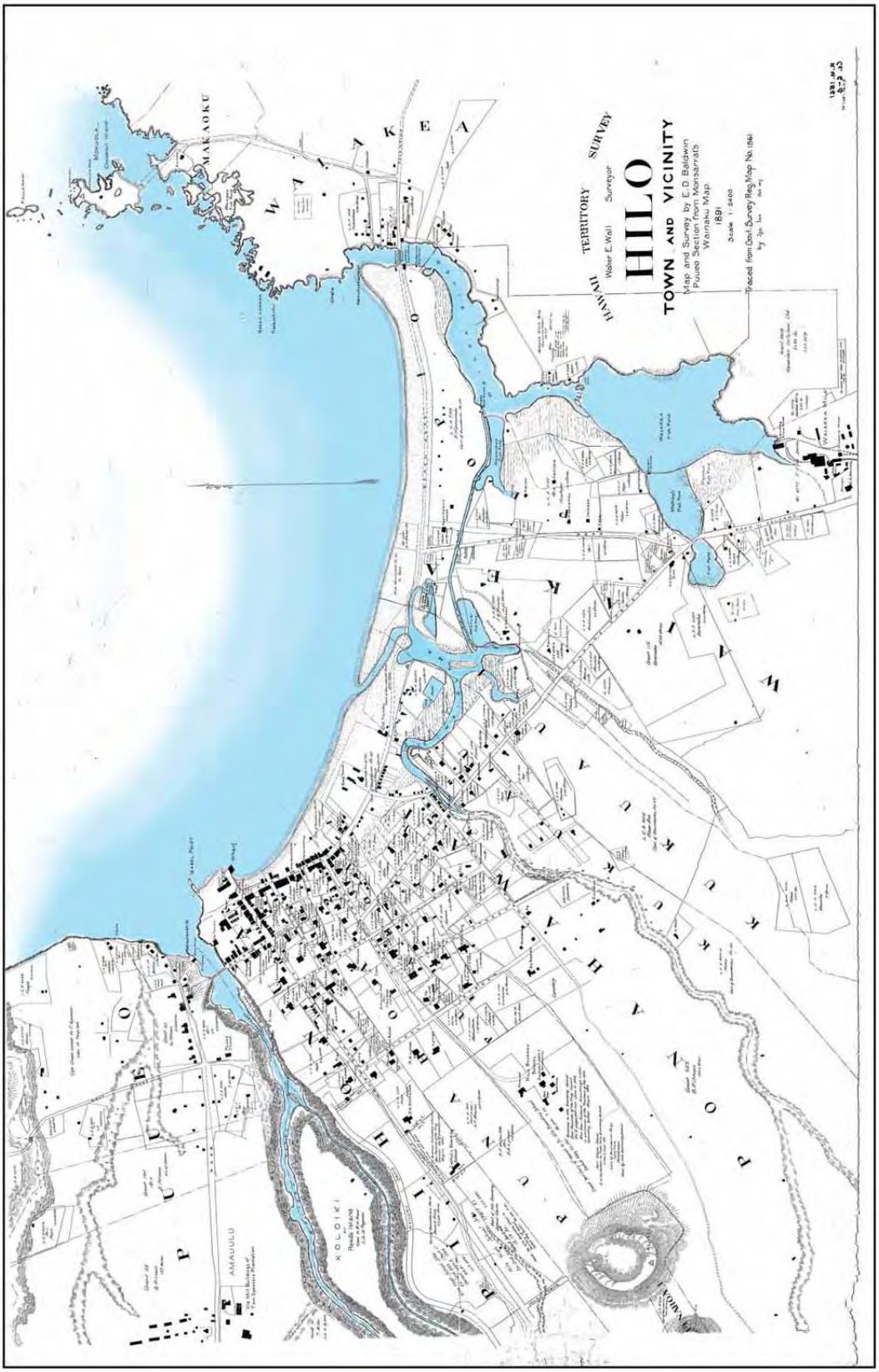

Figure 14. 1891 map of Hilo Town and vicinity (Government Survey register map 1561).

PRIOR ARCHAEOLOGICAL STUDIES

There have been several prior studies in the coastal portions of the current study *ahupuaʻa*, seven of which (DMH, Inc. 1990; Kelly and Athens 1982; Pietrusewsky 1989; M. Rosendahl 1988; Smith and Tourtellotte 1988; Wolforth 2004, 2006) are of particular relevance to the current project. All of these studies were conducted for locations or at sites in an around the current project area (Figure 15).

In 1990, a comprehensive statewide study of Hawaiian fishponds was conducted that identified ten fishponds or former fishponds in the current project vicinity (DMH, Inc 1990). Nine of these ponds were assigned reference numbers corresponding to their mapped locations (Figure 16). Ponds 75, 76, and 77 are known from historical records to have existed in the Waiōlama area of Kūkūau Ahupuaʻa. Five ponds were identified at the Wailoa River area of Waiākea: Hoakimau (78), Mohoʻuli (79), Waiākea (80), Waihole (81), and Kalepolepo (not numbered). Waiohinu Pond (82) was identified at the Liliʻuokalani Gardens area of the Waiākea Peninsula, and Kanakea Pond (83) (also locally known as "ice pond" and assigned SIHP site 18896) was identified at Reed's Bay.

In 1982 the Bishop Museum conducted a study (Kelly and Athens 1982) of the then proposed improvements to the Alenaio Stream channel. The *makai* portion of their study area included the Waiōlama portion of the current study area. Kelly and Athens (1982:7) concluded that although no sites were discovered there was the potential for the discovery of subsurface "historic or prehistoric Hawaiian agricultural remains" in the former Waiōlama Marsh area.

As part of a larger study to identify suitable locations for the construction of the Hilo Judiciary Complex, M. Rosendahl (1988) investigated two locations within the current Wailoa State Park area and concluded that there were no intact cultural resources within her study areas.

In the area near the mouth of the Wailoa Stream in the vicinity of the current Suisan Fish Market, human skeletal remains were discovered, excavated, and studied (Pietrusewsky 1989; Smith and Tourtellotte 1988). This discovery, while only that of a single set of remains, does indicate that the possibility exists for additional remains, especially in coastal areas of former dune deposits along the Hilo bay front. As Wolforth suggests, "sand dunes are a preferred burial location, and it should be expected that prehistoric burials once existed within some portion of the sandy shoreline of Hilo Bay" (2007:29).

Wolforth conducted two archaeological studies for proposed parks within the greater Hilo Bay area: for Kūhiō-Kalanianaʻole Park (2004), and for Reedʻs Bay Beach Park (2006). As a result of his 2004 study, Wolforth identified three sites, Kanakea Pond (SIHP Site 18896), another small-unnamed pond (SIHP Site 24230), and a remnant feature (SIHP Site 7413) of the former railroad. Preservation was recommended for the two pond sites and no further work for the railroad trestle support. Wolforth's (2006) Reed's Bay archaeological study identified five sites, two of which were recorded in his earlier study (Wolforth 1004). In addition to Sites 7413 and 18896, Site 24917 (Reed's Bay Beach), Site 24918 (location of Scott-Legionnaire Hotel), and Site 24919 (Pecked Basins) were identified. No further work was recommended for three of the sites, and preservation was recommended for Sites 7413 and 18896.

Records on file at the State Historic Preservation Division reveal that five sites, all dating from the Historic Period, have been previously recorded in the vicinity of the Hilo Bayfront Trail project area. All were recorded by John Wright as part of the Statewide Inventory conducted in 1974. SIHP Site 7452 is the "*Tsunami* Clock" located on Kamehameha Ave; Site 7461 is a warehouse and landing at the back of Waiākea Pond, which are remnant structure from the Waiākea Mill; Site 7484 is the bridge constructed over Wailoa River on top of which Kamehameha Avenue was built; Site 7485 is the designation for the Suisan Fish Market; and Site 7486 is Liliʻuokalani Gardens located on the Waiākea Peninsula. Proposed trail alignments pass by all of these locations, which provide good opportunities for the presentation of interpretive information.

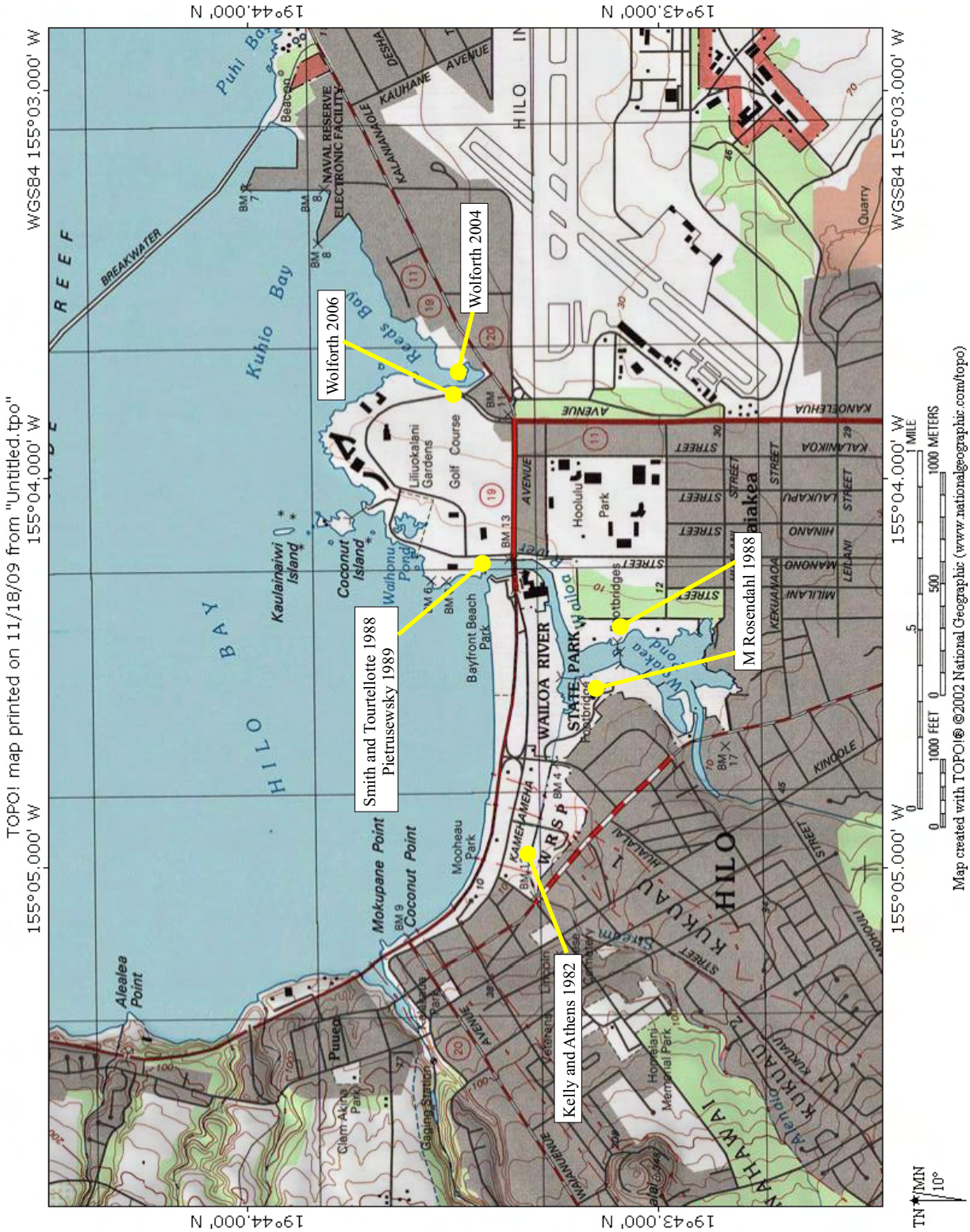

Figure 15. Previous archaeological studies in the Hilo bay front area.

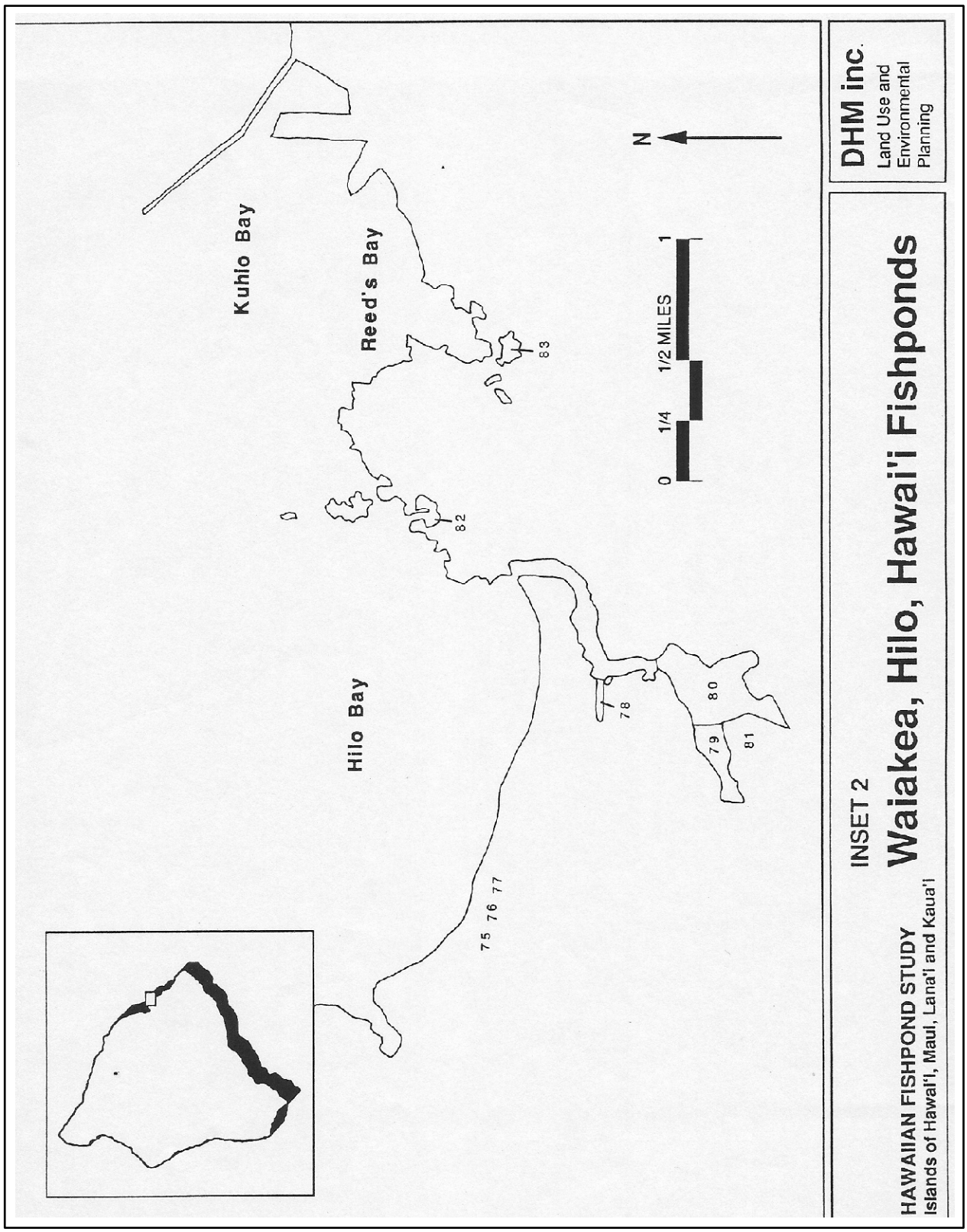

Figure 16. Locations of former and current fishponds in the project area vicinity (from DMH, Inc. 1990).

PROJECT AREA EXPECTATIONS

Expectations for the identification of Precontact archaeological resources within the current project area are limited given the amount of development that has already occurred. Nonetheless the study area lies within what McEldowney (1979) has termed the Coastal Settlement Zone. This area extends from the shore to about ½ mile inland, and was a center of Hawaiian habitation with "a nearly continuous complex of native huts and garden plots interspersed with shady groves of trees" (McEldowney 1979:16). Burial and ceremonial sites are also known to have once existed in close proximity the shore. As Hilo Town remained a focus of habitation through the Historic Period into modern times, much if not all of the earlier evidence of habitation was impacted. *Tsunami* also had devastating effects on not only the people but the landscape, scouring much of Hilo's low lying coastal area. However, many Historic Period resources have survived and are visible across the general project area. Most of the current study area traverses existing roadways and sidewalks and expectation for identifying archaeological resources in these areas are very low. The central portion of the current project area includes open parklands and a couple of currently undeveloped parcels. However, expectations for these areas are also low as while they are currently undeveloped they were formerly either residential, commercial, or industrial locations that following the 1946 and 1960 *tsunami* were not redeveloped.

FIELDWORK METHODS AND FINDINGS

Between August and October 2009, Robert B. Rechtman, Ph.D., Matthew R. Clark, B.A., and/or Johnny R. Dudoit, B.A. walked all of the proposed alignments for the Hilo Bayfront Trails project. The area from the Harbor entrance along Kalaniana‘ole Street to Banyan Drive and around the Waiākea Peninsula to the Wailoa River already has roadways and sidewalks that will be modified or improved to support their use as part of the proposed trail system. From the Wailoa Bridge around the Waiākea Fishpond complex (including Hoakimau, Moho‘uli, Waiākea, Waihole, Kalepolepo, and Waiohinu ponds) and along the Hilo bay front through the Waiōlama area to Kaipalaoa Point, the proposed trail alignments extend across formerly developed areas that are now either parkland or in two locations to the east and south of Waiākea Pond, heavily vegetated vacant land. The downtown Hilo portions of the proposed trail incorporate existing roadways and sidewalks that will be only surface modified to identify the trail alignment.

As was discussed earlier in this study, the proposed trail alignments passes by or through many historic places and sites (e.g., Kanakea Fishpond, Banyan Drive, Lili‘uokalani Gardens, Moku Ola, Suisan Fish Market, Wailoa Bridge, Waiākea Fishpond Complex, Waiākea Mill Site, Waiōlama Marsh area, Kaipalaoa Point, and downtown Hilo). However, there were no specific archaeological features observed within any of the proposed alignments. This area has been subject to repeated development and environment devastation over the course of its history, and while subsurface archaeological deposits may be present in some locations they are likely to be highly disturbed. As Wolforth articulated:

> The problem is that the subsurface archaeological remains are not likely to be intact. In other words, they are not likely to exist as layer upon layer of distinct 'horizons' of occupation and use. Rather, the continuous developments in this location over the years have taken place on the same ground surface. The royal families lived and played on the same surface that the Shinmachi residents and businesses built on, and the railroad built on, and the 1946 tsunami scoured clean, and the industry and warehouse built on, and the 1960 tsunami scoured clean, and the current roads were built on. (Wolforth 2007:30)

While no specific archaeological features were identified that would be impacted by the project, the potential; however remote, does exists for as of yet undiscovered buried features (in either a disturbed or pristine context) to be encountered during subsurface development activities.

RECOMMEDATIONS

It is the recommendation of this study that an archaeological monitor be present during all of the potential ground-disturbing activities associated with currently undeveloped segments of the proposed trail alignment, particularly in the vicinity of the Suisan Fish Market and within the Wailoa State Park, Waiolama Fields, and Hilo Bayfront Beach Park areas. An archaeological monitoring plan should be submitted to and approved by DLNR-SHPD prior to the commencement of any such activities.

REFERENCES CITED

Bird, I.
1964 *Six Months in the Sandwich Islands*. Honolulu: University of Hawaii Press. Prepared for Friends of the Library. (1st edition: 1890)

Cordy, R.
2000 *Exalted Sits the Chief. The Ancient History of Hawai‘i Island*. Honolulu: Mutual Publishing.

Desha, S.
2000 *Kamehameha and His Warrior Kekūkaupi‘o*. Honolulu: Kamehameha Schools Press.

DMH, Inc.
1990 Hawaiian Fishpond Study Island of Hawai‘I, Maui, Lana‘i and Kaua‘i. Prepared for Hawaii CZM Program.

Ellis, W.
1963 *Journal of William Ellis*. Honolulu: Advertiser Publishing Co., Ltd.

Fornander, A.
1996 *Ancient History of the Hawaiian People*. Honolulu: Mutual Publishing.

Hitchcock, D.
1897 *Forty Years' Reminiscence of Life in Hilo, Hawaii*. Published in the Hilo Hawaii Herald, May 27, 1897.

Hudson, A.
1932 Archaeology of East Hawaii. Report on file at the B. P. Bishop Museum.

I‘i, John Papa
1959 *Fragments of Hawaiian History*. Honolulu: Bishop Museum Press.

Ka‘aihue, M. (Editor)
1991 *Songs of Helen Desha Beamer*. Honolulu: Abigail K. Kawananakoa Foundation.

Kamakau, S.
1961 *Ruling Chiefs of Hawaii*. Honolulu: Kamehameha Schools Press.

1991 *Tales and Traditions of the People of Old, Nā Mo‘olelo a ka Po‘e Kahiko*. Honolulu: Bishop Museum Press.

1992 *Works of the People of Old: Nā Hana a ka Po‘e Kahiko*. Honolulu: Bishop Museum Press.

Kelly, M., and J. S. Athens
1982 Archaeological and Historical Studies for the Alenaio Stream Flood Damage Reduction Study, Hilo, Hawaii. Department of Anthropology, Bernice P. Bishop Museum. Prepared for U.S. Army Engineer Division, Pacific Ocean.

Kelly, M., B. Nakamura, and D. Barrère
1981 *Hilo Bay: A Chronology History*. Department of Anthropology, Bernice P. Bishop Museum. Prepared for U.S. Army Corps of Engineers, Honolulu District.

Lang, L.
2007 *Exploring Historic Hilo*. Honolulu: Watermark Press.

Lucas, P.
1995 *A Dictionary of Hawaiian Legal Land-Terms*. Native Hawaiian Legal Corporation.

Lydgate, J.
1922 *Hilo Fifty Years Ago*. Thrum's Hawaiian Annual.

Malo, D.
1951 Hawaiian Antiquities. *B.P. Bishop Museum Special Publication* 2. B.P. Bishop Museum Press, Honolulu. (2nd edition) (Translated by N. Emerson)

Maly, K. (translator)
1992-3 *Ka‘ao Ho‘oniua Pu‘uwai no Ka-miki* (The Heart Stirring Story of Ka-Miki). Published in Ka Hōku o Hawai‘i, January 8, 1914-December 6, 1917.

1996a Historical Documentary Research and Oral History Interviews: Waiākea Cane Lots (12, 13, 17, 18, 19, 10 &20-A), Land of Waiākea, District of South Hilo, Island of Hawai‘i. Kumu Pono Associates Report W01-0795 (III). Prepared for the Ho‘oikaika Club of the University of Hawaii, Hilo

1996b Appendix A In: Archaeological Assessment Study Hilo Judiciary Complex Project, Lands of Wainaku, Pōnohawai, Pi‘ihonua, and Waiākea, South Hilo District, Island of Hawai‘i (TMK: 2-6-15:1,2; 2-6-16:2; 2-4-49:18,19; 2-2-15:33; 2-4-1:12). Paul H. Rosendahl, Inc., Hilo. PHRI Report 1721-061496. Prepared for State of Hawai‘i, Honolulu.

McEldowney, H.
1979 Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo Hawai‘i. Manuscript on file, Department of Land and Natural Resources-State Historic Preservation Division.

Moniz, J.
n.d. Historical and Archaeological Synthesis of Land Use and Settlement Patterns, Waiākea Ahupua‘a, Hilo, Hawaii. Manuscript on file at DLNR-SHPD Hilo Office (1994).

Pietrusewsky, M.
1989 Human remains Found at Wailoa Bridge Renovation Project, Waiakea, South Hilo. Department of Anthropology, UH-Manoa.

Pukui, M., Elbert, S., and Mookini, E.
1974 *Place Names of Hawai‘i*. Honolulu: University Press of Hawaii.

Rosendahl, M.
1988 Archaeological Reconnaissance Survey for Environmental Impact Statement, Hilo Judiciary Complex Sites. PHRI Report 356-040888. Prepared for Wilson Okamoto and Associates, Inc., Honolulu.

Smith, M., and P. Tourtellotte
1988 Wailoa Bridge Renovation Project, Site No. 50-10-11115 Burial Removal. DLNR-Historic Sites Section, Honolulu.

Stokes, J., and T. Dye
1991 *Heiau of the Island of Hawai‘i*. Bishop Museum Bulletin in Anthropology 2. Honolulu: Bishop Museum Press.

Thrum, T.
1907 Tales from the Temples. *Hawaiian Almanac and Annual for 1908*:48-78. Honolulu

1920 *Hawaiian Annual for 1921: The Reference Book of Information and Statistics Relating to the Territory of Hawaii*. Honolulu, Hawaii

Warshauer, K.
2003 Some Banyan Drive Signs Need Correction. *Hawaii Tribune-Herald*, April 27, 2003, Hilo.

2004 Famed Trees of Banyan Drive Still Mislabeled. *Hawaii Tribune-Herald*, April 11, 2004, Hilo.

Wolforth, T.

2004 Inventory Survey for the Proposed Kūhio-Kalaniana‘ole Park, Hilo: Investigations into the Kanakea Fishpond at Reed’s Bay TMK: 3-2-1-6:13 and 15. Scientific Consultant Services, Inc. Report B1. Prepared for The Rotary Club of East Hawai‘i.

2006 Inventory Survey for the Proposed Reed’s Bay Beach Park, Hilo. Scientific Consultant Services, Inc. Report. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

2007 Cultural Impact Assessment for Hilo Bayfront Master Plan, North Hilo District, Island of Hawai‘i. Scientific Consultant Services, Inc. Report 771-1. Prepared for the County of Hawai‘i Department of Parks and Recreation, Hilo.

APPENDIX A – Hilo BayFront Trails Project Tax Map Parcels and Rights-of-Way

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-3-004:001	State	Kaipalaoa Landing; vehicular roadway with metal gate for access to Wailuku River sewage pump site; USCG Lighthouse.	Trail markings on existing paving; gate renovation as necessary to allow pedestrian access when the metal gate is closed; interpretive signs # 22 and 23.
2-3-001:002	State	Mo‘oheau Bus Terminal; one-way vehicular entry; pedestrian walkway from Kamehameha Ave. pedestrian crossing; Mo‘oheau Bandstand; lawn area with large canopy trees; baseball field and small storage structure; chain link fence at edge of Bayfront Highway.	Shared use path; trail markings on existing pedestrian walkway; trailhead sign; interpretive signs # 18b, 19b; landscape enhancement along *mauka* side of existing fence.
2-2-005:002	State/County	Ball fields; two off-street parking lots, one with low retaining wall on two sides; coconut palm grove; chain link fence at edge of Bayfront Highway.	Shared use path; wheel stops in the *makai* stalls of parking lots; reconfiguration of easternmost parking lot and associated low retaining wall demolition to accommodate shared use path; relocation of approx. 7 coconut palms; landscape enhancement along *mauka* side of existing fenceline; interpretive sign #16b.
2-2-004:035	State	Lawn area with exceptional monkeypod tree.	Shared use path; landscape enhancement along *mauka* side of existing fence.
2-2-004:028	State	Lawn area with exceptional monkeypod trees.	Shared use path; interpretive sign # 15b.
2-2-006:026	State	Lawn area with coconut palms.	Shared use path.
2-2-006:001	County	Flood control area with berm; lawn area with grove of coconut palms along Ponahawai St.; open lawn area with a row of rainbow shower trees along Kamehameha Ave. and adjacent to Kumu St. parking and sidewalk.	Shared use path with *ahupua‘a* plaque (18a); trailhead sign; parking lot (approx. 20 stalls); interpretive signage/monument 18a; rainbow shower tree relocation (8) between berm and Kamehameha Ave. sidewalk.
2-2-007:018	State	Fields for soccer (4 youth); Waiolama Canal; shade structure; and announcement board.	Two-way bicycle route along parking lot drive.
2-2-004:002	County	Fields for soccer (3 older youth); rainbow shower trees along Kamehameha Ave.; chain link fence 40'-0" from *mauka* edge of existing sidewalk along Kamehameha Ave.	Shared use path along *makai* side of existing chain link fence paralleling Kamehameha Ave.; shared use path parallel to Pauahi Street; footing for shared use path bridge; trailhead sign and interpretive sign # 16a.
2-2-011:001	State	Fields for soccer (3 youth); Waiolama Canal with adjacent shade trees; bridge; rest room and outdoor shower area; unpaved parking area bounded by wheel stops; shade trees and coconut palms near top of slope.	Shared use path; interpretive sign # 17; native tree grove on top of slope.

continued on next page

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-2-011:016	State	Lawn area with shade trees and palms; Waiolama Canal.	Shared use path and bridge over Waiolama Canal; interpretive sign # 15a.
2-2-006:027	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Ponahawai St./Kamehameha Ave. corner.
2-2-004:060	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
2-2-004:025	Private Parcel	Gas station.	Potential future purchase to connect shared use path to Pauahi St./Kamehameha Ave. corner.
2-2-004:001	State	Vehicular entry via Pi‘opi‘o St. to recreation area; lawn areas with trees; Wailoa River State Recreation Area signage.	Shared use path.
2-2-003:003	State	Bishop St.; portion of Punahoa St. and Pi‘opi‘o St.; King Kamehameha statue and interpretive signage (2); Pacific Tsunami Museum Shinmachi interpretive signage (1); lawn area with canopy trees and coconut palms; fields for soccer.	Shared use path up to and over Pi‘opi‘o St. bridge; barrier on bridge to separate shared use path from vehicular lanes marked pedestrian crossings at Pi‘opi‘o St. and Bishop St.
2-2-012:001	State	Lawn area with canopy trees and coconut palms; Pi‘opi‘o St. bridge.	Shared use path after Pi‘opi‘o Street bridge crossing if not accommodated in 2-2-013:003.
2-2-013:003	State	Wailoa Center; War Memorial; Shinmachi Tsunami Memorial; vehicular roadways and parking; Hoakimau Pond; Wailoa River with single arched bridge; asphalt paths; lawn areas with canopy trees and coconut palms.	Shared use path.
2-2-031:001	State	Waiākea Fish Pond and some surrounding land; migratory bird resting area “fingers.”	Shared use path with marked pedestrian crossings at boat ramp, from Pi‘ilani St. proposed bike route; and across large pavilion service drive; trailhead sign; interpretive signs # 26, 27a, 27b, 28; potential adjustment to a portion of covered walkway at pavilion cluster to accommodate bicycles on shared use path; potential moving bridge over Wailoa River.
2-2-011:016	State	Lawn are with shade trees and palms; Waiolama Canal.	Shared use path and bridge over Waiolama Canal; interpretive sign # 15a.
2-2-002:001	State	Lawn area with trees and palms.	Shared use path; potential bridge footing; interpretive sign # 14.
2-2-014:002	State	Sloped and level lawn areas.	Shared use path; interpretive sign # 29.
2-2-029:008	State	Unimproved off-street parking; lawn area with canopy trees.	Shared use path; trailhead sign; interpretive sign # 30.

continued on next page

Tax map parcels within the project area: ownership and uses.

TMK #	*Ownership*	*Current Use*	*Trail Action*
2-2-029:027	State	Mohouli Pond and its edges, including "fast land."	Shared use path; potential bridge at the mouth of the pond.
2-2-029:001	State	Waiākea Stream from outlet of flood control channel; lawn area with trees and palms south of the stream and adjacent to Waiākea Pond; portion of Maile Street.	Shared use path; potential bridge; trailhead sign; parking lot (approx. 40 stalls); small quantity tree relocation.
2-2-053:019	Private parcel	Private roadway (Maile Street).	Shared use path.
2-2-053:020	Private parcel	Unused.	Shared use path.
2-2-003:023	State	Lawn area with trees and palms adjacent to Waiākea Pond.	Shared use path.
2-2-031:015	State	Vegetated area; storm drain easement at south end of parcel.	Shared use path (possibly a boardwalk with footings in water); possible storm drain extension.
2-2-033:001	County	Hoʻolulu Complex.	Interpretive sign # 31.
2-2-004:056	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod trees.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-003:046	State	Portion of Hilo Bayfront Beach Park with exceptional monkeypod tree.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
2-2-002:035	State	Portion of Hilo Bayfront Beach Park.	Trail markings on future shared use path and interpretive sign # 13 coordinated with Hilo Bayfront Beach Park improvement plans.
2-2-001:027	State	Portion of Hilo Bayfront Beach Park.	Trail markings on future shared use path and interpretive sign # 12 coordinated with Hilo Bayfront Beach Park improvement plans.
2-1-001:012	State	Golf course and driving range.	Shared used path; trailhead sign.
2-1-001:102	State	Berm at corner of Lihiwai Street and Kamehameha Avenue.	New shared use path with inside railing; trailhead sign.
2-1-003:001	County	Liliʻuokalani Gardens.	Trail markings on existing pedestrian walkways; one-way bicycle route; interpretive signs # 9, 10a, 10b, 11.
2-1-003:019	County	Moku Ola or Coconut Island, Por. Liliʻuokalani Gardens.	Trail markings on existing pedestrian walkways; interpretive signs # 7, 8 to be coordinated with interpretive signage by Pacific *Tsunami* Museum
2-1-005:001	State	Reed's Bay Beach Park.	Trail markings on future pedestrian walkway and interpretive sign # 5 to be coordinated with implementation of Reed's Bay Beach Park improvements.
2-1-006:010	County	Kanakea Pond (Ice Pond).	Cantilever pedestrian boardwalk and viewing deck.
2-1-009:007	State	Hilo Harbor.	Interim trail markings and marked pedestrian zone and crossing on existing paving from Pier 1 shed to main gate at Kūhiō Street. This may require adjusting the location of parking stalls and barriers along this route.

Rights-of-way within the project area: ownership and uses.

Rights-of-Way	*Ownership*	*Current Use*	*Trail Action*
Wailuku Drive: Kamehameha Ave./Kaʻiulani St.	County	One-way (Kamehameha Ave./Kinoʻole St.) and two-way (Kinoʻole St./Kaʻiulani St.) vehicular roadway; sidewalk on Downtown Hilo side; curb and gutter; parking; marked pedestrian crossings with ramps; riverside planting.	One-way and two-way bicycle routes; interim trail markings on existing pedestrian walkway; trail markings on future pedestrian walkway in Wailuku Riverwalk; interpretive signs # 24, 25 coordinated with Pacific Tsunami interpretive signage and implementation of Wailuku Riverwalk plans.
Kekaulike Street: Wailuku Dr./ Waiānuenue Ave.	County	One-way vehicular roadway; curb and gutter; sidewalks; marked pedestrian crossings.	Trail markings on existing pedestrian walkway.
Kaʻiulani Street: Wailuku Dr./ Waiānuenue Ave.	County	Two-way vehicular roadway.	Two-way bicycle routes.
Kapiʻolani Street: Waiānuenue Ave./Haili St.	County	Two-way vehicular roadway (except on certain days and times); sidewalks; curb and gutter; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Waiānuenue Avenue: Kamehameha Ave. /Haili St.	County	One-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Haili Street: Kapiʻolani St./ Kamehameha Ave.	County	Two-way vehicular roadway; sidewalks; curb and gutter; parking; marked pedestrian crossings with ramps.	Trail markings on existing pedestrian walkway.
Bayfront Highway Wailuku River Bridge/Pauahi St.	State/County	Two-way vehicular roadway; planted median (noncontiguous); paved shoulders; *mauka* side turf strip with chain link fence at property line; *makai* shoreline revetment wall (noncontiguous).	Two-way bicycle lanes; marked pedestrian crossing at Waiānuenue Ave.; sign for Hāmākua-bound users of proposed Bayfront Highway bike lane that there is no outlet until Waiānuenue Ave. proposed marked pedestrian crossing.
Bayfront Highway Pauahi St./Wailoa Bridge	County	Portion of Hilo Bayfront Beach Park used for parking and driving lanes and bicycle route.	Trail markings on future shared use path coordinated with implementation of Hilo Bayfront Beach Park improvement plans.
Kamehameha Avenue Waiānuenue Ave./ Kamehameha Ave.	County/State	Two-way vehicular roadway with painted median (noncontiguous); paved shoulders; parking; curb and gutter; sidewalks; marked pedestrian crossings; rainbow shower street trees.	Two-way bicycle lanes; trail markings on existing pedestrian walkways; interpretive signs # 19a, 20, 21 embedded in existing pedestrian walkway.

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Rights-of-way within the project area: ownership and uses.

Rights-of-Way	*Ownership*	*Current Use*	*Trail Action*
Kamehameha Avenue: Kamehameha Ave./Kalaniana‘ole St.	County/State	Two-way vehicular lanes; curb and gutter (noncontiguous); Wailoa Bridge with curb and gutter, pedestrian walkways with railings; *makai* asphalt pedestrian paving from Lihiwai St. to Banyan Dr.; paved shoulders.	Two-way bicycle lanes; bridge lane restriping, barrier installation; sidewalk renovations/expansion for shared use path over bridge.
Kumu Street: Kamehameha Ave./end	County	Two-way parking aisle; curb and gutter; parking; sidewalks.	Two-way bicycle route.
Kawelolani Street: Wailoa River State Recreation Area/Manono St.	County	Unimproved right-of-way with water easement.	Shared use path; trailhead sign.
Pi‘ilani Street: Kanoelehua Ave./Wailoa River State Recreation Area	County	Two-way vehicular roadway.	Two-way signed shared road; two-way bicycle routes.
Manono Street: Kamehameha Ave./Pi‘ilani St.	County	Two-way vehicular roadway; sidewalk on Ho‘olulu Complex side; street trees.	Two-way bicycle lanes; marked pedestrian crossings at Kawelolani St. ROW and at Pi‘ilani Street.
Lihiwai Street: Kamehameha Ave./Banyan Dr.	County	Two-way vehicular roadway; parking; curb and gutter; sidewalks; marked pedestrian crossings.	Two-way bicycle routes; trail markings on existing pedestrian walkway; trailhead signs (2).
Banyan Drive: Banyan Way/Lihiwai St.	County	Two-way vehicular roadway with planted median (noncontiguous); curb and gutter; parking; sidewalk on *makai* side; banyan trees.	Two-way bicycle routes; trail markings on existing pedestrian walkway; shared use path; trailhead signs (2).
Banyan Drive: Banyan Way/ Kamehameha Ave.	County/State	Two-way vehicular roadway with planted median; paved shoulder; curb and gutter.	Two-way bicycle routes.
Banyan Way: Banyan Dr./ Kalaniana‘ole St.	County	Two-way vehicular roadway; parking on *makai* side; *makai* asphalt curbs and asphalt pedestrian walkway with metal railing on retaining wall.	Two-way bicycle routes; trail markings on existing pedestrian walkway.
Kalaniana‘ole Street: Banyan Way/Kūhiō St.	County	Two-way vehicular roadway with shoulder for bike route; asphalt curb and pedestrian walkway (discontinuous); landscape strip; ROW fronting 21-7:9 improved with curb, gutter, sidewalk, landscape strip.	*Makai* side: curb, gutter, pedestrian walkway with trail markings; shoulder for bicycle route.
Kūhiō Street: Kalaniana‘ole St./ Hilo Harbor main gate	County	Two-way vehicular roadway with shoulders; curb, gutter, chain link fence with barbed wire, and pedestrian walkway on west side of ROW.	West side: trail markings on existing pedestrian walkway; landscape enhancements; interpretive sign # 1 interim location.