RECEIVED
2002 AUG 29 P 2:

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

August 27, 2002

LD-NAV
L-1358 (1)

C&CoHDTSTRANSITWAIANAE.CHT
Suspense Date: 9/11/02

MEMORANDUM:

TO:
XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
Land Division Branches:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: City and County of Honolulu Department of Transportation Services Draft Environmental Assessment (DEA) Covering the WAIANAE COAST COMMUNITY TRANSIT CENTER (AUGUST 2002)
Consultant: AM Partners, Inc. - Project No. A0096.20

Please review the DEA covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date.

NOTE: One (1) Copy of the subject DEA is available for your review in the Land Division Office, room 220.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(X) We have no comments.

( ) Comments attached

Signed:
DOFAW Administrator

Date: 8/28/02

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4525 • FAX: (808) 523-4730 • INTERNET: www.honolulu.gov

June 24, 2003

Ms. Dierdre S. Mamiya
Administrator
Land Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Mamiya:

Subject: Waianae Coast Community Transit Center
Draft Environmental Assessment (DEA) Tax Map Key: 8-6-1:29

Thank you for distributing copies of the Draft Environmental Assessment (DEA). I understand that in addition to the Land Division, the following units of your department were given the opportunity to review and comment on the subject project.

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Division of State Parks
- Division of Boating and Ocean Recreation
- Commission on Water Resource Management
- Land Division Planning and Technical Services
- Land Division Engineering Branch
- Oahu District Land Office

Based on the responses we received, the Department of Land and Natural Resources has no comment to offer at this time. Should you have any questions or comments, please don't hesitate to contact James Burke of my staff at 523-4445.

Sincerely,

CHERYL D. SOON
Director

200 feet distant from the site. The Traffic Management Plan will also include provisions that will allow uninterrupted use of existing cross walks.

Safety: The project's Specifications will describe the areas that can be used for staging. The prevention of theft and vandalism to the construction property, and the protection of the general public from construction activities are responsibilities of the General Contractor. The General Contractor will be directed to comply with all applicable rules that protect the health and safety of the general public.

Runoff: Very little construction runoff is anticipated. The site is relatively flat and the only earth-moving activities expected are primarily minor excavation for the footings of the proposed structures and to accommodate installation of underground utilities.

Pile driving: It is not likely that pile drivers will be used. Available soil data on the site indicates that deep structural foundations such as piles will not be required.

Consultations: The FEA will include the list of agencies, organizations and individuals who received a copy of the draft EA or who were referred to the web-site that hosted a copy of the DEA. We are aware of the requirement to consult with the local planning agency. The City and County of Honolulu, Department of Planning and Permitting has been given ample time to review the DEA and submit comments.

Funding: State funds will not be directly expended on this project. Federal funds may be used, but a final determination is not available at this time.

Parking: Approximately 100 parking stalls will be provided in the park-and-ride lot adjoining the transit center.

Ridership and Routes: It is estimated that the Waianae transit center will have a daily ridership of approximately 1,200. This estimate is based on current and planned services. A map of the bus routes that will converge at the center will be provided in the FEA.

Determination: Thank you for noting that for a draft EA, the proper determination is *anticipated FONSI* (Finding of No Significant Impact).

The Final Environmental Assessment (FEA) will be amended to address the concerns and comments discussed in your letter. Should you have any additional questions or comments, please don't hesitate to contact James Burke of my staff at 523-4445.

Sincerely,

CHERYL D. SOON
Director

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813

GENEVIEVE SALMONSON
DIRECTOR

September 20, 2002

Ms. Cheryl Soon
Mr. James Burke
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Mr. Gordon Wood, A.I.A.
AM Partners, Inc.
1164 Bishop Street, Suite 1000
Honolulu, Hawai'i 96813

Dear Ms. Soon and Messrs. Burke and Wood:

Having reviewed the draft environmental assessment for the Wai'anae Coast Community Transit Centre, Tax Map Key 8-6-1, parcel 29, in the judicial district of Wai'anae, we offer the following comments for your consideration and response:

1. *VISUAL IMPACT ASSESSMENT*: Figures 1.2, 1.3, 1.4, and 1.5 provide photographs of current site conditions. Please also provide a rendering of what the completed project will look like as viewed from the ground on Leihoku Street.
2. *USED ACETYLENE CYLINDERS*: Page 19 notes that "[a]dditional [acetylene] cylinders may be encountered during development of the property, however these containers are not considered to be a significant hazard." While acetylene is not explosive at ordinary atmospheric pressure, as a compressed gas (2 atmospheres or more) exposed to spark or decomposition, it can be explosive (Merck Index, 9th Edition, p. 11). In your exercise of due diligence, please discuss what mitigative measures will be taken during site construction, and what professional made this determination that these containers constitute no significant hazard and the reasons for this opinion.
3. *LANDSCAPING WITH NATIVE PLANTS*: Section 103D-407, Hawai'i Revised Statutes requires the use of native Hawaiian plants. Please consider the use of native xerophagic flora in landscaping. Our website at http://www.state.hi.us/health/oeqc/index.html contains an online book entitled "How to Plant a Native Hawaiian Garden" by Kenneth Nagata.
4. *USE OF GLASSPHALT*: Section 103D-408, Hawai'i Revised Statutes requires the use of recyled glass in paving materials. Please consider using glass-asphalt aggregate for paving purposes.

If there are any questions, please call Leslie Segundo, Environmental Health Specialist, at (808) 586-4185. Thank you for the opportunity to comment.

Sincerely,

for GENEVIEVE SALMONSON
Director

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

CHERYL D. SOON
DIRECTOR

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

June 24, 2003

Ms. Genevieve Salmonson
Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Waianae Coast Community Transit Center
<u>Draft Environmental Assessment (DEA) Tax Map Key: 8-6-1:29</u>

Thank you for your comments dated September 20, 2002, regarding the Draft Environmental Assessment (DEA) of the Waianae Coast Community Transit Center. All comments timely received will be included in the Final Environmental Assessment to be submitted to your office.

In response to your concerns and comments to the Draft Environmental Assessment we offer the following statements:

<u>Visual Impacts</u>: Drawings of the site, the proposed buildings and any proposed landscaping that show the final appearance of the project in greater detail, and a detailed site plan will be incorporated in the Final Environmental Assessment (FEA).

<u>Paving and Landscaping</u>: We are familiar with the requirements of Hawaii Revised Statutes (HRS) 103D-407, which requires the use of recycled glass in paving materials whenever possible, and of HRS 103D-408, which requires the use of native Hawaiian flora whenever and wherever possible. We are aware of these requirements and are grateful for the reminder.

<u>Construction Impacts</u>: The FEA will provide a discussion of construction impacts and planned mitigation measures, particularly in the following areas:

Traffic: A Traffic Management Plan will be provided in the final design documents for each aspect of the construction that will determine required street closures, if any, and the mitigation measures to reduce the impacts of those closures.

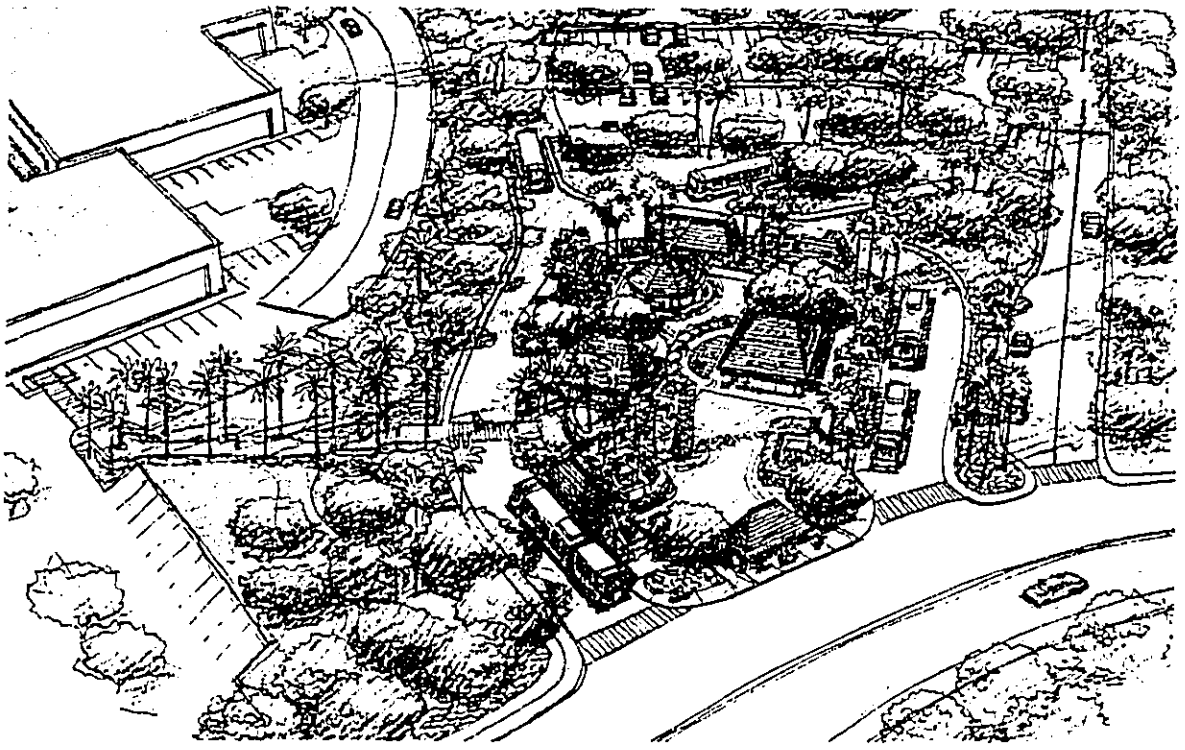
The Traffic Management Plan will also provide mitigation measures to minimize impacts on pedestrian traffic. The bus stop closest to the project site is on Leihoku Street, approximately

2003-11-08-OA-FEA

WAI`ANAE COAST COMMUNITY TRANSIT CENTER

Final Environmental Assessment

Wai`anae, Hawai`i



Prepared for:

The Department of Transportation Services
City and County of Honolulu

Prepared by:

AM Partners, Inc.

October 2003

TABLE OF CONTENTS

PROJECT SUMMARY

Project Name	Wai`anae Coast Community Transit Center
Proposing Agency and Accepting Authority	Department of Transportation Services City and County of Honolulu 650 South King Street 3rd Floor Honolulu, Hawaii 96813
Agent	AM Partners, Inc. 1164 Bishop Street, Suite 1000 Honolulu, Hawaii 96813 Contact: Gordon S. Wood Phone: (808) 526-2828 Fax: (808) 538-0027
Property Owner	Lenakona Development, Ltd. Property to be acquired by the City and County of Honolulu
Tax Map Key	8 – 6 – 1:29
Project Location	86 – 052 Leihoku Street Wai`anae, O`ahu, Hawai`i
Parcel Total	7.6910 acres Land size 331,143 square feet
Existing Use	The site consists of mostly unimproved vacant land. There exists two structures; both are mini-warehouses, 4,800 square feet and 630 square feet.
State Land Use Designation	Urban
City and County Zoning	I-2 (Intensive Industrial)
Special Management Area	Not in the SMA
Flood Zone Designation	D (Areas of undetermined flood hazard)

SUMMARY OF IMPACTS

Short-Term Impacts

Short-term impacts resulting from construction related activities would occur only during the construction period. Standard construction mitigation measures will be taken to alleviate construction related impacts. The extent of construction impacts should not be adverse.

Long-Term Impacts

Long-term impacts affecting the environment are not expected to vary much from the existing conditions. Vehicular traffic, noise and air quality are not expected to create any significant impact over the existing conditions. The project should have positive impacts on the economy and the community, however the heightened use of the site and the improvements may attract possible unwelcome activity and may require slight modifications and/or additions to current security measures. However, to help minimize the need for additional security, defensible design concepts will be utilized and incorporated into the project.

CONFORMANCE WITH EXISTING PUBLIC PLANS, POLICIES AND CONTROLS

The project conforms to the objectives of the Hawai'i State Plan and Functional Plans, and the City and County of Honolulu General Plan objectives and policies. The subject site is within the Wai'anae Sustainable Communities Plan area, and the project supports its policies, guidelines, vision and goals.

ALTERNATIVES CONSIDERED

Three alternatives to the project were considered: no action, delaying the project, and alternate sites along the Wai'anae coast. In summary, the alternatives analysis indicated that none of the above alternatives compared as favorably as the proposed action.

1.1 PURPOSE AND OBJECTIVES

The applicant, the Department of Transportation Services of the City and County of Honolulu, proposes to develop a community transit center to accommodate express, trunk, and circulator bus services. This Environmental Assessment (EA) is prepared pursuant to and in accordance with the requirements of Chapter 343 Hawaii Revised Statutes, and Chapter 200 of Title 11, Department of Health Administrative Rules. The action that triggers this assessment is the use of City & County funds in the planning, design and construction of the community transit center. Federal funds may be used to implement this project; therefore, this EA is intended to satisfy relevant provisions of the National Environmental Policy Act.

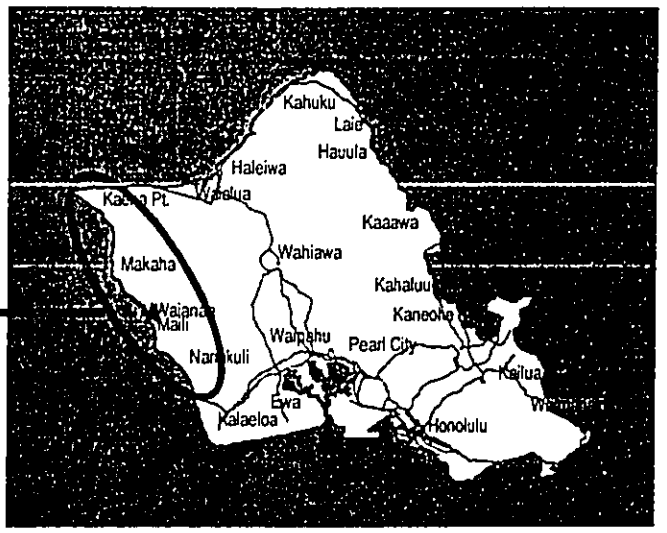
The proposed Wai`anae Community Transit Center will feature aesthetically designed elements and amenities: a comfort station, clock tower, community gathering space, well-lit sheltered waiting areas, bicycle racks, trees, trellises and other landscape elements.

It will provide accommodation for seven City buses (2 articulated, 5 standard) around a center island, as well as for three school buses. There will also be a parking lot to accommodate approximately 90 – 100 private vehicles and a passenger drop-off/pick-up area, which may be constructed as a later phase.

1.2 PROJECT LOCATION

The project site (TMK: 8-6-1:29) is just mauka of Farrington Highway on Leihoku Street in Wai`anae. It is located on the north side of Leihoku Street and is adjacent to and between the Wai`anae Mall, which is on the makai side of the project site, and vacant, industrial zoned land on the mauka side of the project site. The rear of the site abuts residential properties. The Wai`anae Wastewater Treatment Plant (WWTP) and the future site for a YMCA on the south side of Leihoku Street. (See Figure 1, Location and Vicinity Maps; Figure 2, Project Site Map; Figure 3, Tax Map; and Figure 4, Aerial Map.)

Figure 1: Location & Vicinity Maps



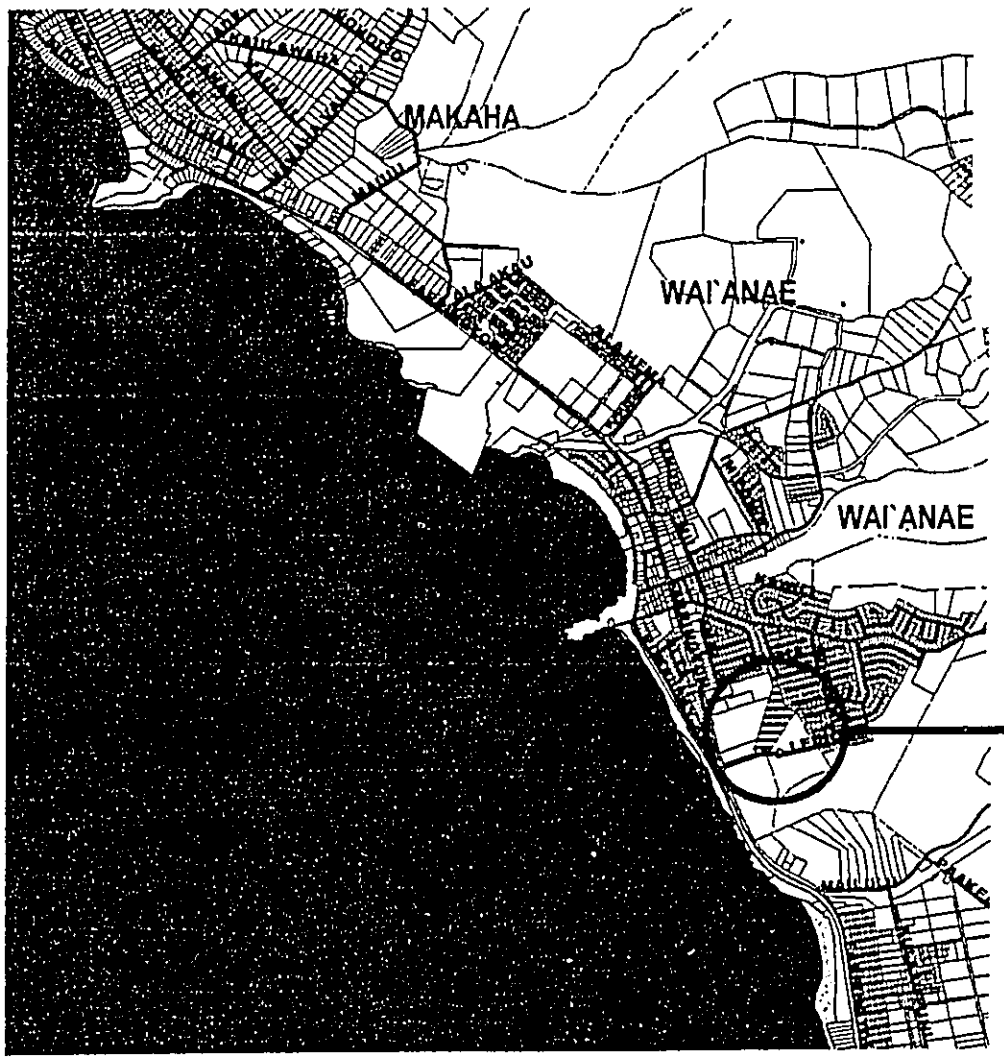


Figure 2: Project Site Map

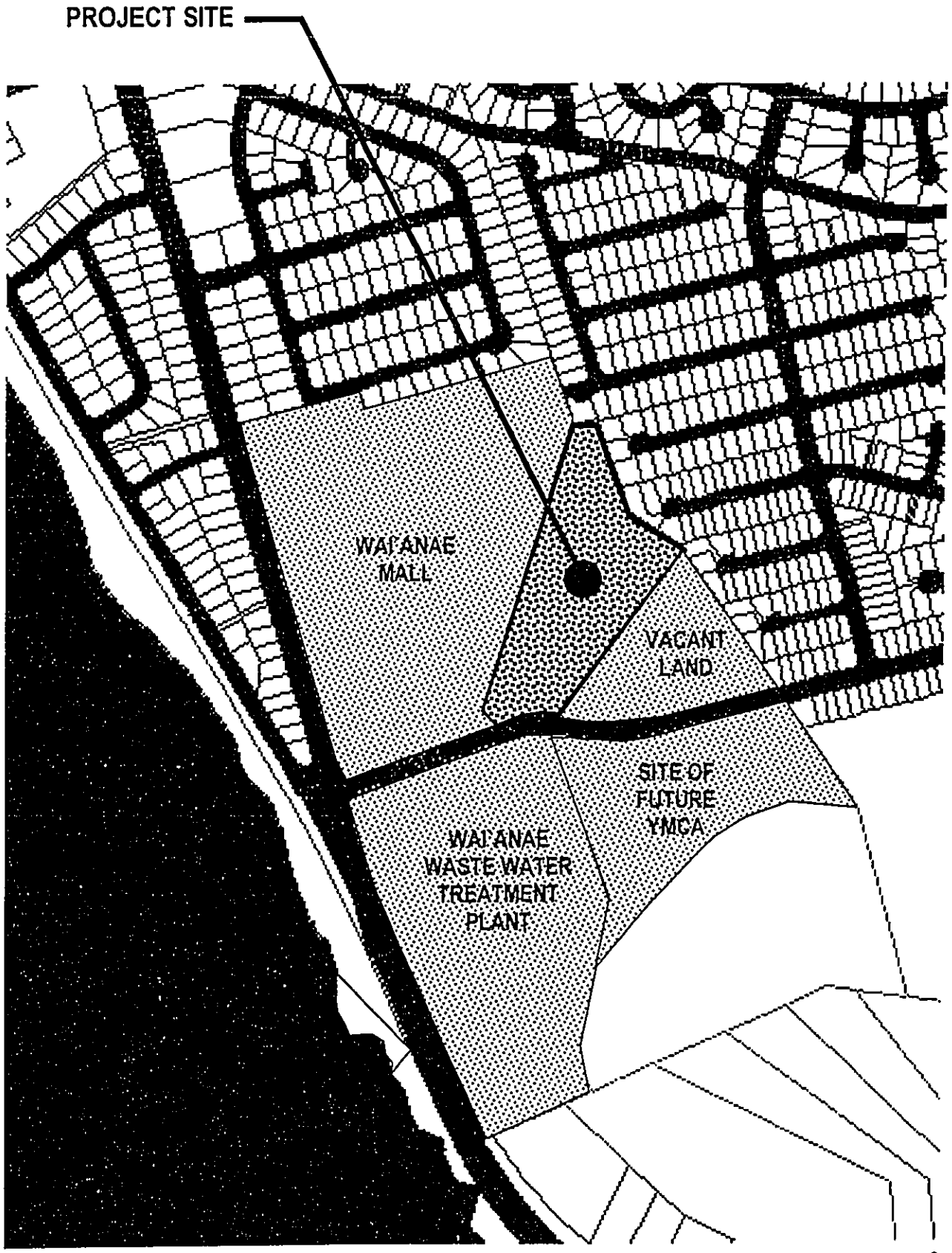


Figure 3: Tax Map

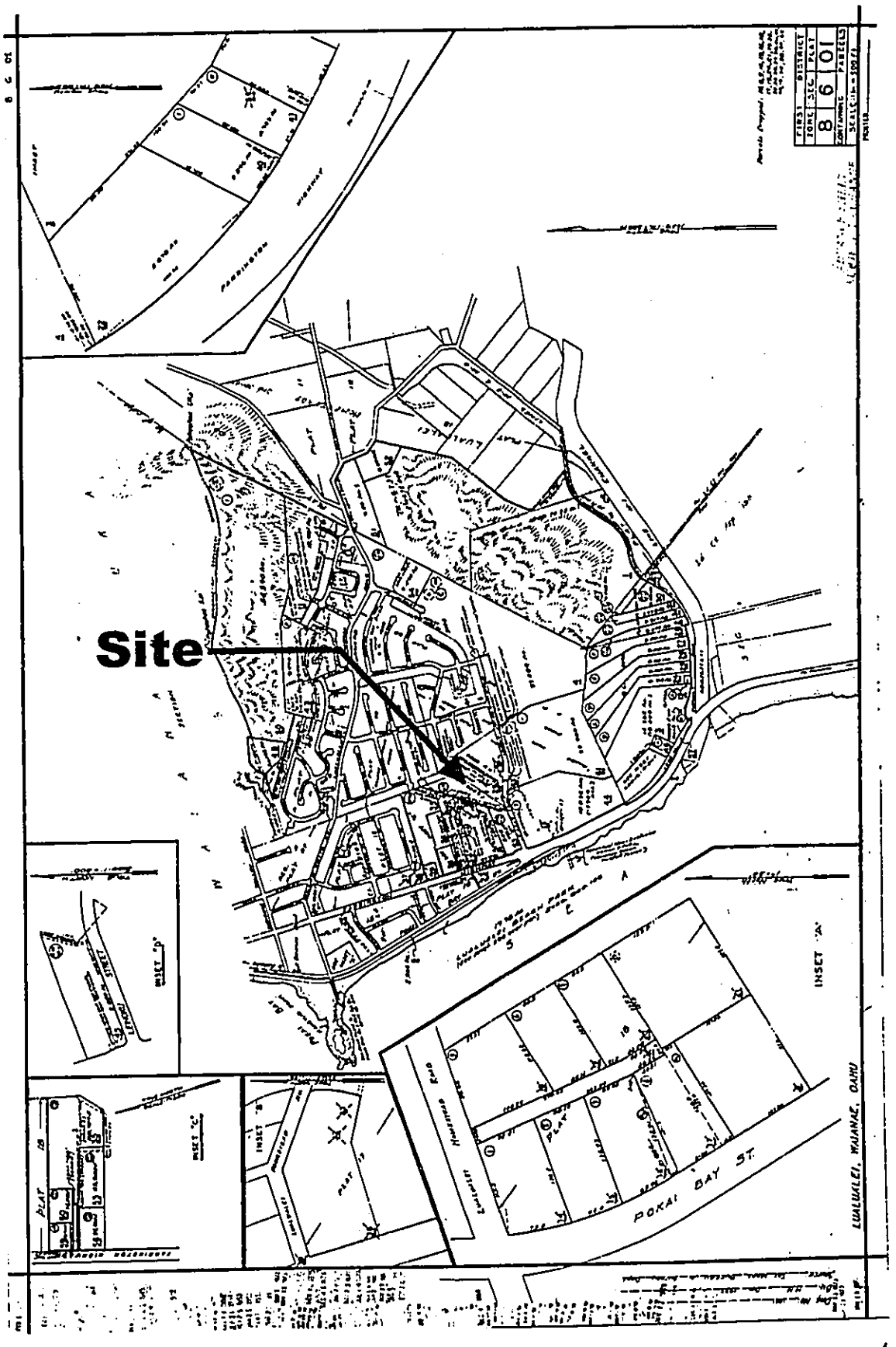
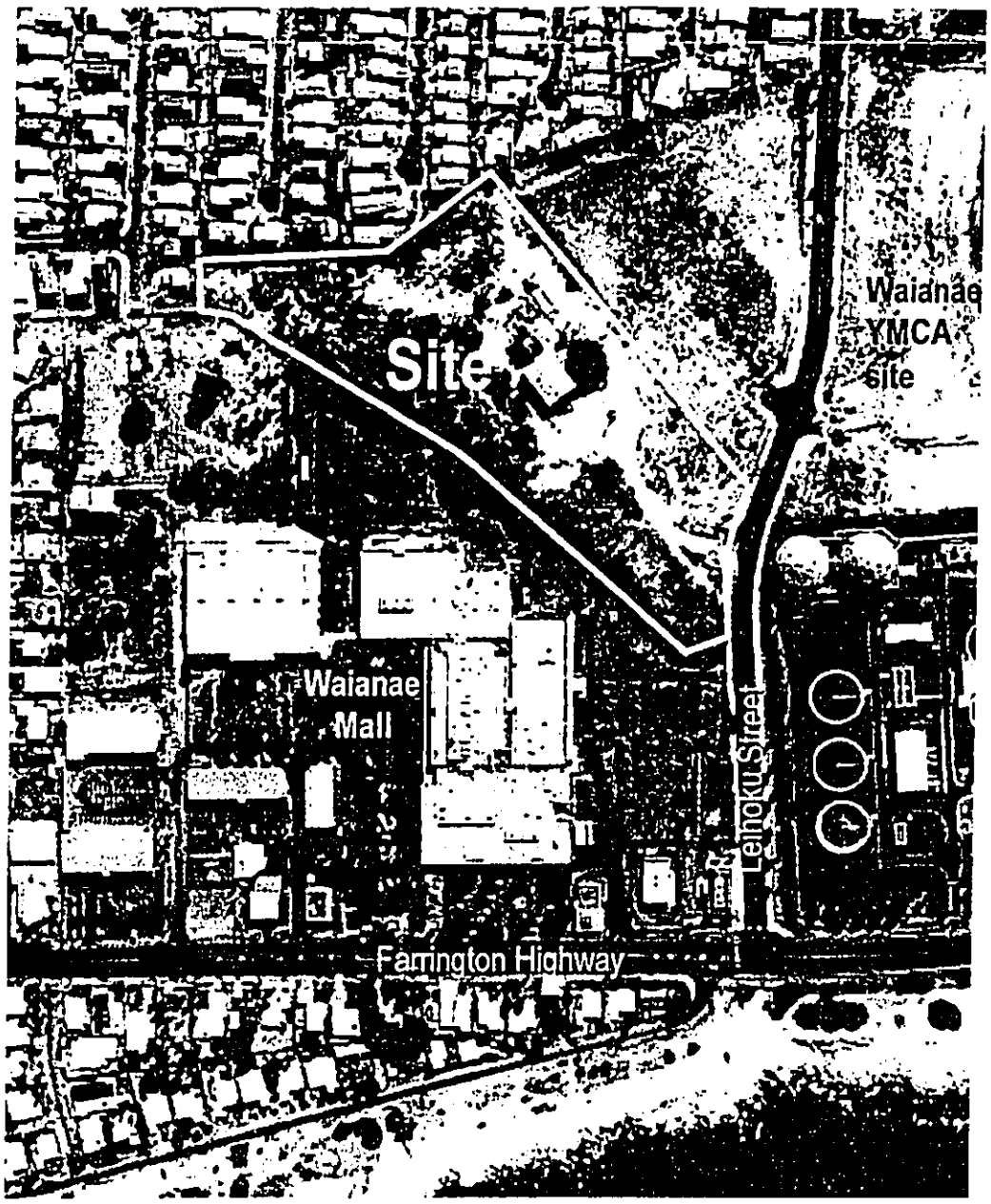


Figure 4: Aerial Map



2.1 PROJECT BACKGROUND AND NEED

From 1998 into 2000, the City and County of Honolulu conducted an extensive community-based visioning process including specifically the transportation component, O`ahu Trans 2K. Thousands of people from every community on O`ahu attended more than 40 workshops and worked to find solutions to the island's steadily worsening mobility and transit problems. The participants agreed that any particular transportation investment should not be seen as an end in itself, rather it should be viewed as one component in a network of island wide transportation improvements that includes quality of life and other benefits that would promote livable communities.

Establishment of a hub-and-spoke bus network system was proposed to maximize the efficiency of the public transportation system. The hub-and-spoke concept reconfigures the existing radial bus network to bring together a number of bus routes and services at specific locations (transit centers), and disperse trips across a wider array of destinations than is presently available, thereby improving accessibility, providing enhanced levels of service and encouraging increased ridership.

Transit centers are major components of the hub-and-spoke system. These will provide central locations for passengers to transfer between community circulators and express or local routes. Buses on all connecting routes will converge at the same time to facilitate quick and seamless transfers. By concentrating many routes at a single point, these centers can also create a heightened awareness of the destinations served by public transit.

Currently Farrington Highway in the Wai`anae District has four lanes of travel, two lanes in each direction, and serves both local community traffic as well as commuter highway traffic. In recent years, with the increase in the Wai`anae District's population, and the general trend of increased reliance on the automobile, traffic congestion has grown progressively worse along Farrington Highway. During the peak traffic period (5:00 – 7:00 am) residents report that the 8-mile trip from Makaha Valley Road to Nanakuli Avenue takes about 45 minutes. Thereafter, commuters headed into downtown Honolulu or Waikiki are then faced with another 1 – 1½ hour drive. Traffic congestion can be alleviated through an enhanced public transportation system for the Wai`anae District.

2.2 PROJECT DESCRIPTION

The project proposes to establish and develop a site for a Transit Center in Wai`anae (which is currently informally operating on Farrington Highway, an extremely busy and congested highway). The new Transit Center will have spaces to accommodate up to 10 buses at any given time (five standard-sized City buses, two articulated City, buses and up to three school buses). The City buses will pulse approximately once an hour during off-peak times and at each half hour during the peak commute times. Maps depicting applicable bus routes may be found online at *http://www.thebus.org*. The new bus schedule will be coordinated such that the City buses would pulse between the school bus pulses thereby avoiding being on site at the same time to provide greater safety for school children while they are boarding and

alighting from the school buses. Therefore it is more likely that no more than 7 buses will typically be on site at any given time.

Except for the two times in the day when school buses will use the additional bus spaces, those spaces will be utilized by paratransit vehicles or other OTS vehicles, (service vehicles, supervisor vehicles, etc.) the rest of the day.

The Transit Center will have a center island staging area that will accommodate several amenities such as a comfort station and a men's and women's restrooms. There will also be a janitor's closet with sink, a storage closet, and a drinking fountain.

Scattered along the perimeter of the center island at each of the bus waiting areas will be well lit covered bus shelters with seating for short-term waiting and queuing. To complement the covered bus shelters, there will also be waiting areas under the shelter of large shade trees with landscape planted sitting areas for a more pleasant wait. Each shelter will be equipped with an electronic reader board carry passenger notifications of bus arrival timed and other pertinent information.

A trellised pavilion with landscaping and lighting will provide partial cover for a small staging area or community gathering place. This could also be an area where community artwork is incorporated into the design in the form of ceramic tile mosaics, or sculptural pieces that would provide the community with a sense of pride and ownership, and possibly added incentive to want to use the transit center. Additional benefits of a community art wall would be a lower likelihood for vandalism and maintenance problems such as graffiti.

There will also be accommodations for bicycles on the center island nicely designed bicycle racks for secure bicycle parking.

A separate area will be provided for safe off-street passenger drop-off and pick-up from and to private vehicles. Since it will have a separate access, private vehicles will not be traveling in the same lanes as the buses thereby lowering the likelihood of bus/auto accidents and private vehicles interfering with the buses' mobility to and from the transit center and vice-versa. An additional shelter will also be located in this waiting area to provide well-lit shelter as passengers make their transition into private vehicles.

The entire site will be designed and constructed in accordance with the guidelines and standards for accessible design as set forth by the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

To encourage use of public transit by commuters, a Park-and-Ride lot for 90-100 vehicles will be provided. The number of spaces to be provided is based upon an assessment of the potential use of a Park-and-Ride facility if provided at this site in concert with the proposed transit center functionality. The parking area will be well-lit with an appropriate number of parking spaces for the disabled.

3.1 PROPOSED CONSTRUCTION

The proposed Waianae Coast Community Transit Center will require some site grading to accommodate necessary grade levels. The project will be constructed in a single phase and will consist of the following elements: seven bays for public transit and paratransit vehicles, three bays for private school buses, a kiss-and-ride drop-off area, parking spaces for approximately 100 vehicles, access road and driveways, eight passenger waiting shelters, comfort station, vending kiosk, information kiosks, a clock tower, bicycle lockers and racks, sidewalks and paths, landscaping and other site features. The project's conceptual site plan is shown in Figure 5.

The visual impact the proposed buildings and landscaping will have on the site will be clearly shown on the site drawings in greater detail, refer to Figure 5.

Very little construction runoff is anticipated. The site is relatively flat and the only earth-moving activities expected are some grading and minor excavation for the footings of the proposed structures and to accommodate installation of underground utilities.

Pile drivers will likely not be used. Available soil data on the site indicates that deep structure foundations such as piles will not be required.

A Traffic Management Plan will be provided in the final design documents for each aspect of the construction that will determine required street closures, if any, and the mitigation measures to reduce the impact of those closures. The Traffic Management Plan will provide mitigation measures to minimize impacts on pedestrian traffic. The bus stop closest to the project site is on Leihoku Street and is located approximately 200 feet from the site. The Traffic Management Plan will include provisions that will allow uninterrupted use of existing cross walks.

The General Contractor will be directed to comply with all applicable rules that protect the health and safety of the general public. The Project Specification will describe the areas that can be used for staging. The prevention of theft and vandalism to the construction site, and the protection of the general public from construction activities are the responsibilities of the General Contractor.

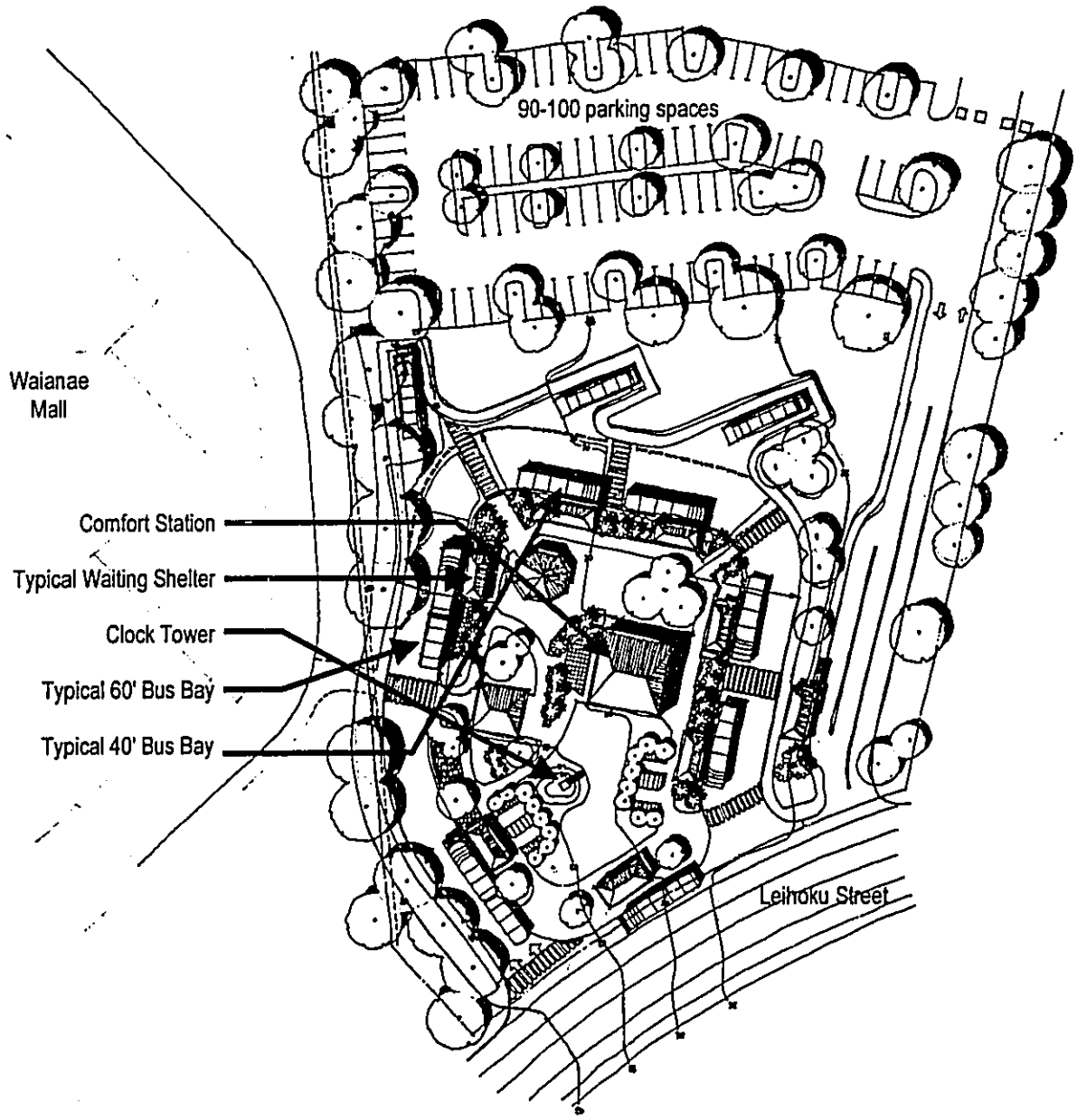
3.2 CONSTRUCTION SCHEDULE

The project is expected to have a construction schedule of six to eight months that includes demolition, grading, building construction and landscaping/paving work. Construction will begin once all land use and ownership issues are resolved and building permits are granted.

3.3 ESTIMATED COST

The project cost is estimated at $3.34 Million, which includes planning, design, land acquisition and construction.

Figure 5: Conceptual Site Plan



4.1 PHYSICAL ENVIRONMENT

4.1.1 Climate

TEMPERATURE & WIND. The climate of Hawai`i is usually pleasant for the tropics due in large part to the persistent trade winds. The Wai`anae Mountains parallel the west coast of O'ahu, at an average elevation higher than 2,000 feet. The Wai`anae Coast is generally sunny, hot and dry the entire year. The average daily temperature ranges from about 67 degrees Fahrenheit to 85 degrees Fahrenheit. Because the trade winds, which range from 12 to 15 mph, come from the northeasterly to east direction, the Wai`anae coast which is on the southwestern or leeward side of the island, tends to feel warmer. In some leeward areas, an afternoon sea breeze is common, especially in the summer.

PRECIPITATION. O`ahu is driest along the Wai`anae Coast where rainfall drops to less than 20 inches a year. Rainfall is most likely to occur during the nighttime or in the morning hours and least likely to occur during mid-afternoon. Correspondingly, not only is rainfall more frequent at night, but also the total nighttime fall averages more than the total daytime fall when the two 12-hour periods are compared. Daytime showers, usually light, often occur while the sun continues to shine. However, rainfall is highly variable from one year to another.

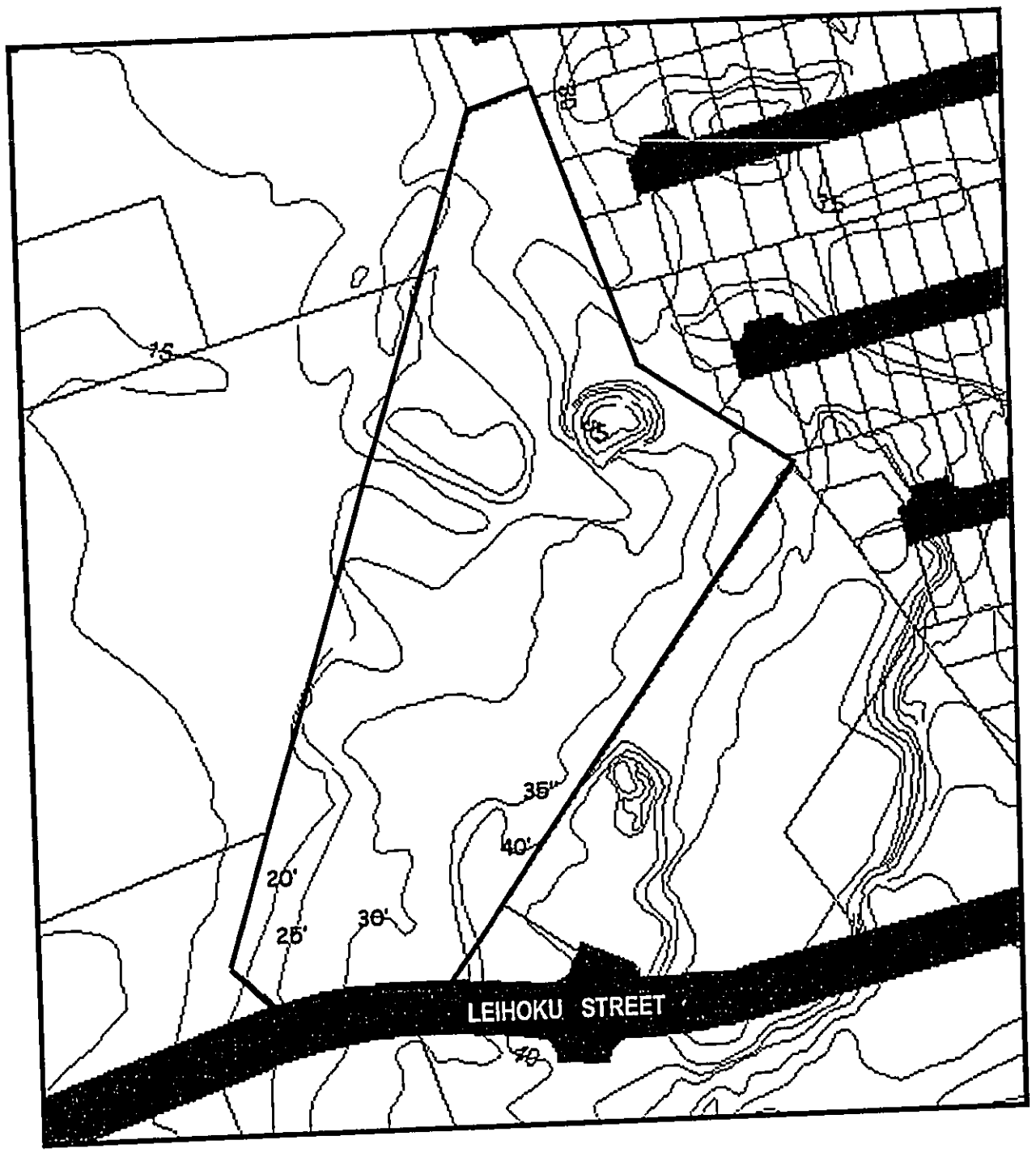
CLOUDINESS. Under standard definitions of cloudiness, clear represents 0.3 or less of the entire sky dome covered with cloud, partly cloudy 0.4 - 0.7, and cloudy 0.8 or more coverage. With reference to these definitions, the percentage of clear daylight conditions ranges from 30 – 60% and cloudy conditions decrease to less than 20%. In general, the leeward areas, which are less affected by trade wind cloudiness, tend to be cloudier during the winter when general storms and frontal passages are more frequent. Leeward coasts and the lowlands are actually sunnier than the foregoing percentages suggest, since a large part of the reported sky cover consists of clouds which lie over the mountains to windward, but may not obscure the sun or the sky directly overhead.

HUMIDITY. The relative humidity commonly averages 60 – 70%, with winter relative humidities somewhat higher than summer ones. In terms of daily variations, the maximum values occur with the minimum temperatures, during the late night and very early morning. Nighttime values in the leeward lowlands and other drier localities are more frequently between 70% and 80%. Afternoon values are commonly between 50% and 55% in the drier, warmer coastal zones and seldom fall below 40%. Thus, except on the high mountains, the general regime in Hawai`i is one of high humidities as compared with conditions in most other states.

4.1.2 Topography, Geology, Soils

The topography of the site is relatively flat with a slight slope. The property gradually drops approximately 20 feet from the mauka side of the property to the makai side in the proposed area to be developed (approximately a 15% slope at its steepest).

Figure 6: Topography



4.1.3 Hydrology

GROUND WATER. The Wai`anae District has limited groundwater resources. It occurs as basal water (low level) impounded by coastal caprock (the formation of the Ghyben-Herzberg lens which is fresh water in lens-shaped bodies near sea level, locally referred to as basal lens), formed by deposits of terrestrial and marine

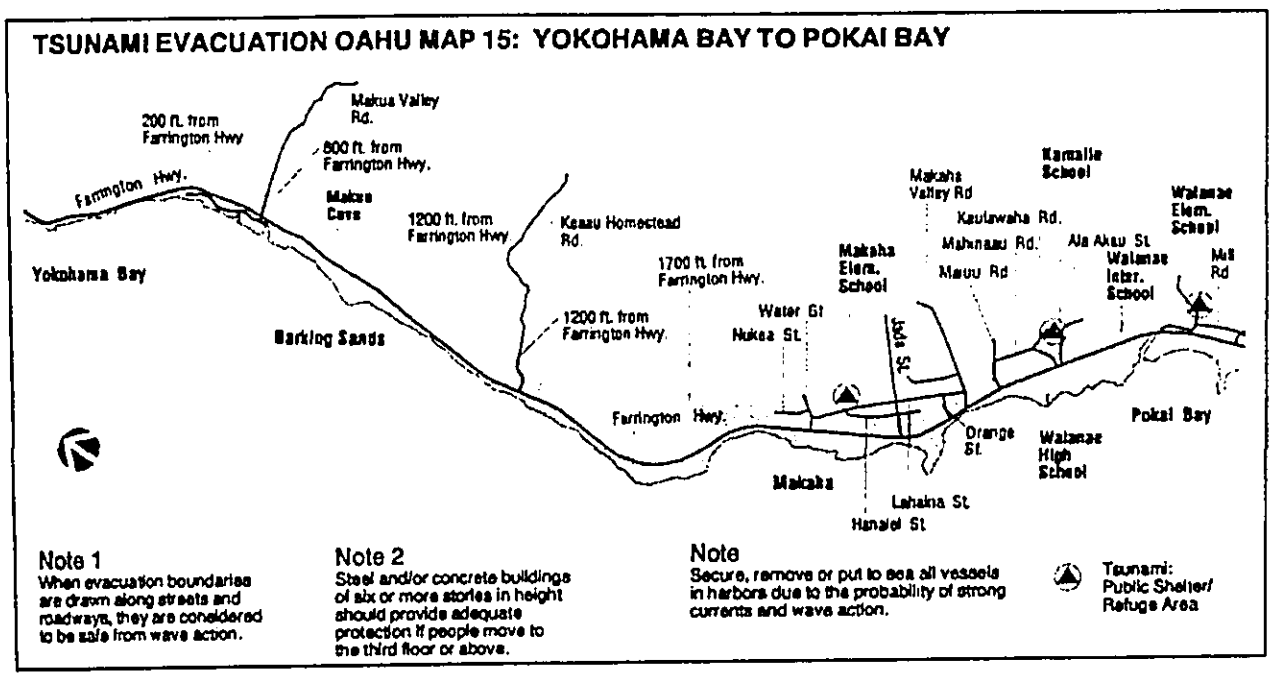
sediments, and as perched water (high level) impounded by lava dikes. The project site lies on the northern edge of the Lualualei Ahupua`a in an area identified by the Wai`anae Sustainable Communities Plan as "Country Town". There appears to be no existing groundwater, and the site is well away from the nearest stream conservation corridor.

TSUNAMI INUNDATION. According to the Civil Defense Tsunami Inundation and Evacuation Maps, it is determined that the site is within the vulnerable inundation area. (See Figure 7, Tsunami Inundation Map, from Verizon Hawaii Super Pages, August 2001.)

FLOOD PLAIN MANAGEMENT. In accordance with the Flood Insurance Rate Maps (FIRM) issued by the Federal Emergency Management Agency (FEMA) the proposed project site is in Flood Zone D, identifying this area as being of undetermined but possible flood hazard. Just makai of the project site, paralleling the coast, is Flood Zone AE, which identifies an area inundated by 100-year flooding for which basal flood elevations (BFE) have been determined. Along the coast just makai of the AE flood zone, the shore is identified as being in flood zone VE. VE is also an area inundated by 100-year flooding with velocity hazard (wave action) for which BFE's have been determined. (See Figure 8, Flood Insurance Rate Map.)

SPECIAL MANAGEMENT AREA. In accordance to Chapter 205A Coastal Zone Management, Part II Special Management Areas, of the Hawaii Revised Statutes, the project site is determined not to be within the Special Management Area. (See Figure 9, Special Management Area Map.)

Figure 7: Tsunami Inundation Map



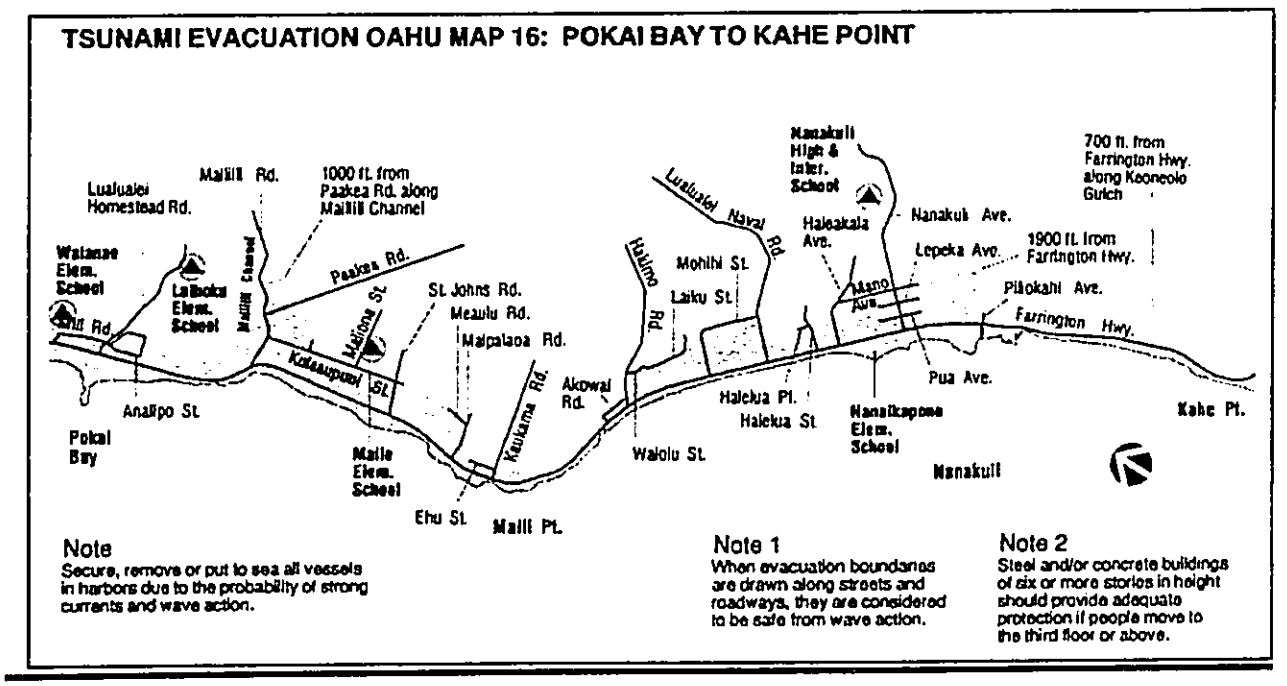


Figure 8: Flood Insurance Rate Map

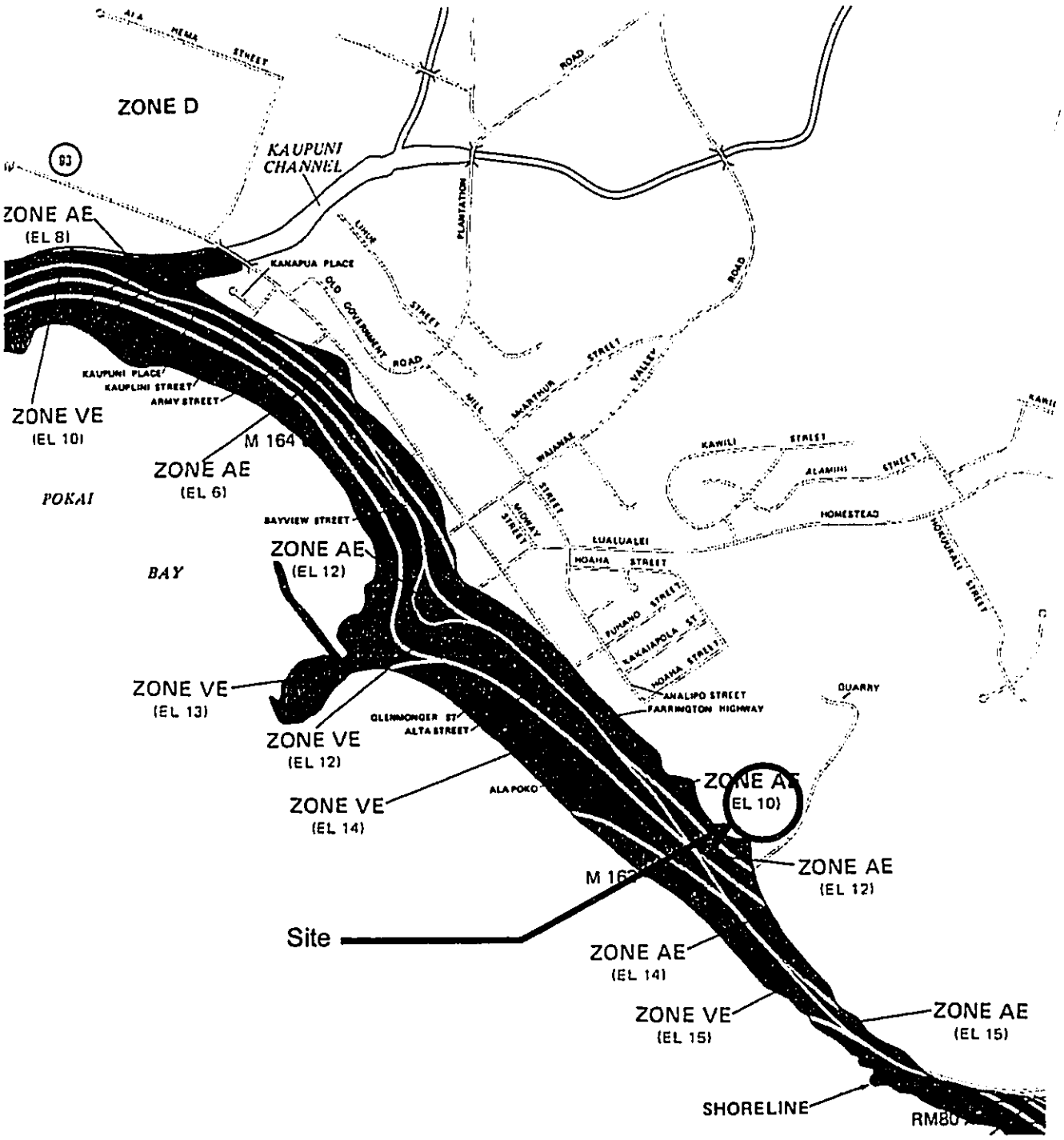
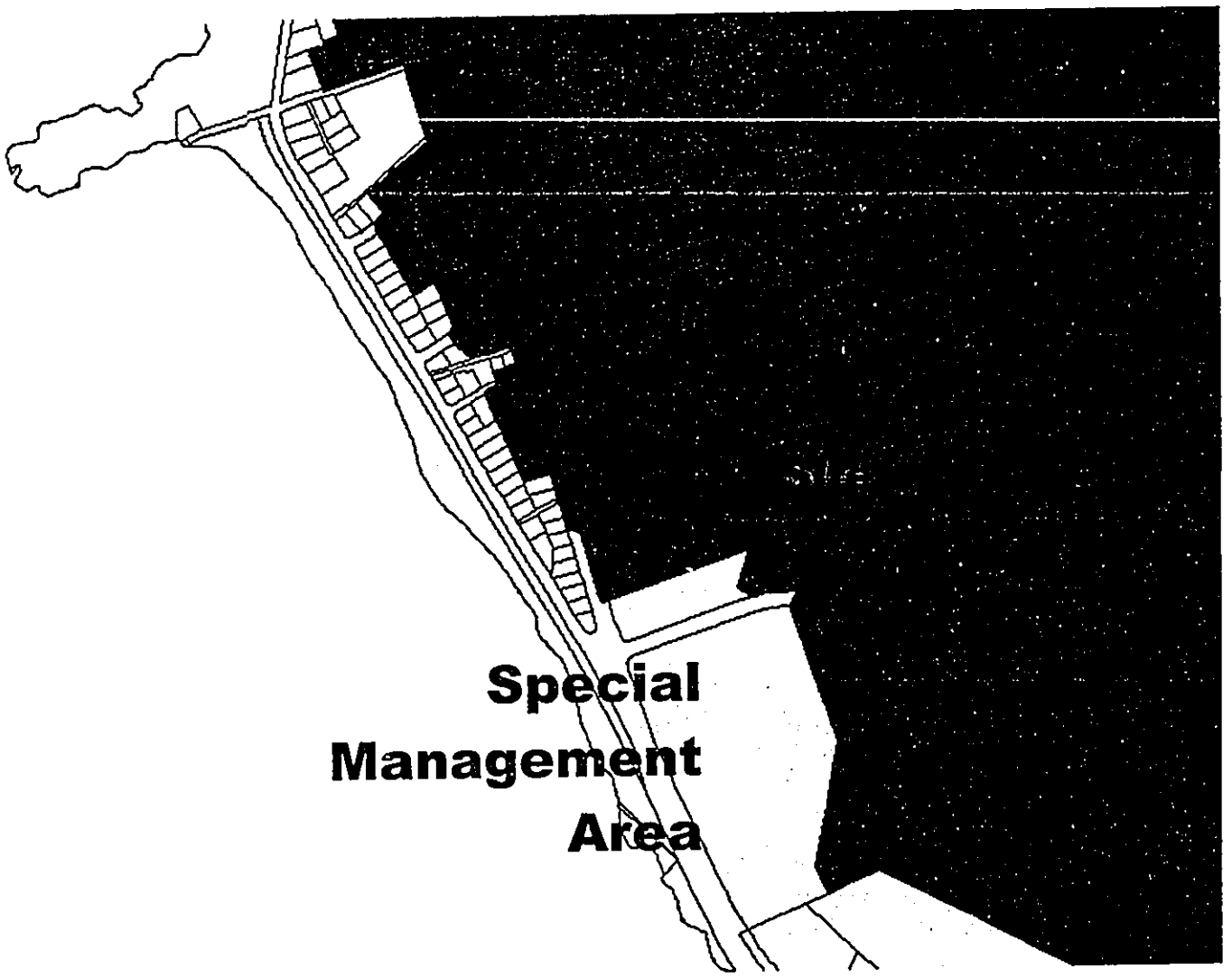


Figure 9: Special Management Area Map



4.1.4 Terrestrial Flora and Fauna

The flora and fauna on the site is characteristic of the unimproved portions of Wai`anae Valley. No evidence of rare, threatened or endangered species of flora or fauna was encountered; the project is not expected to impact rare, threatened or endangered species.

FLORA. The flora scattered throughout the site consist of grass, noxious weeds, wiliwili, various small introduced shrubs, kiawe and koa haole. There is a single Octopus Tree, a single Shower Tree which appeared to be dead, and a single Chinese Banyan Tree which has been trimmed in half along a vertical plane to avoid conflict with power lines running along side past the tree to an abandoned shed.

FAUNA. Wildlife inhabiting the project site may include introduced bird species, rodents, insects and stray or feral dogs or cats.

4.1.5 Scenic and Visual Resources

No significant coastal visual resources are in the immediate vicinity of the site. The proposed transit center will not significantly impact views to or from surrounding areas.

4.1.6 Historic, Cultural and Archaeological Resources

Historical background research including mythological accounts, LCA documentation, and previous archaeological research suggests that Lualualei Ahupua`a was initially occupied by the 15th century, with settlement continuing likely until the early 19th century. Within the project area, however, extensive quarrying activities in the past 70 years have significantly altered the original landscape, probably removing any traditional Hawaiian sites that may have existed.

The proposed Wai`anae Coast Community Transit Center lies in an area which has undergone extensive land altering activities, with the current land surface appearing to have been extensively mined and grubbed over the previous century, rendering it relatively free of surface and subsurface archaeological resources.

The area's history of commercial lime quarrying and associated activities has distorted or terminated native cultural practices, if any, that formerly pertained to the project area parcel. There is no evidence of any cultural practices – including burials, trails, hunting, gathering, and cultural sites – formerly associated specifically with the parcel, nor is there evidence of any ongoing cultural practices.

Based on the above findings, it is concluded that there will be no adverse impact to historical or cultural resources by the implementation of the transit center project.

Refer to Appendix A, An Archaeological and Cultural Impact Evaluation for the Proposed Wai`anae Community Transit Center, Lualualei *Ahupua`a* Wai`anae District, O`ahu (TMK 8-6-1: 29) for the full report. This report also provides a list of the persons, groups and references consulted for this study.

4.1.7 Noise Quality

There will be noise impacts associated with the development of the site as a transit center due to the added traffic created by the buses and private vehicles. Since buses and other vehicles are already operating and traveling along nearby Farrington Highway, the impact will not be significant or inconsistent with the area.

4.1.8 Air Quality

The present air quality at the project site appears to be reasonably good based on nearby air quality monitoring data from monitoring stations operated by the Hawai`i Department of Health. Across the street is the Wai`anae Wastewater Treatment Plant (WWTP) located north of Pu`u Ma`ili`ili`i and south of the Wai`anae Mall. The location of the treatment plant is less than ideal with respect to the project site. The sewer lines were sized to handle area house lots, however since many have not connected to the system, low flows in the lines cause septic conditions in the sewer lines, which often result in odors. The first sewer lines were installed during the 1950's, and some may be nearing the end of their useful lives.

4.1.9 Water Quality and Water Services

Because the head of the basal freshwater lens in the project area is low (water table above sea level is not more than a few feet), the lens is thin and the water quality tends to be brackish. The Board of Water Supply will supply water for irrigation, plumbing, and drinking purposes to the project site. Since there will not be any drilling or digging of a well nor will there be any pumping of water for the project, there should be no impact on the groundwater or water quality.

New waterlines tapping off of existing waterlines will serve the property. There is a 12" waterline in the front of the project site traveling along Leihoku Street, and a 12" stub-out that leads to the property at the existing driveway. Water consumption for the proposed development will be largely as a result of irrigating the landscaping. There will also be a comfort station with four toilets, four lavatories, and one utility sink, and one drinking fountain. Water consumption from the comfort station and drinking fountains is expected to be relatively low. While the Board of Water Supply believes that the existing waterlines are sufficient for the site, water service availability will be determined once permits are applied for and will be based on the demand and existing capacity at that time.

4.1.10 Wastewater

Currently the Wai`anae Wastewater Treatment Plant has excess capacity to handle flows due largely in part to the fact that a great majority of the existing residences, which were developed with cesspools, have not yet connected to the wastewater system. There is a 12" sewer line traveling in front of the property along Leihoku Street with an 8" line leading to the property with a stub-out at the existing driveway.

Additionally, there is a 10" sewer line traveling through an easement on the east side of the property that the project would be able to easily access.

4.1.11 Hazardous Materials/Hazardous Waste

A Phase I Environmental Site Assessment was performed by the R.M. Towill Corporation (RMTC) in December 2000 to investigate past and present land uses of the subject property and surrounding areas and to determine whether conditions or situations at the site might result in present real or potential hazards, or environmental liabilities as dictated by federal, state, and local statutes and regulations. The investigation was also intended to identify areas of potential contamination that may be encountered during construction planned for future development of the site. The site assessment was performed as part of a due diligence audit on the part of a potential buyer of the property with the intention of developing the property as a cable station site for an underwater cable landing on the island nearby the site. The current property owners provided the full report, which is a matter of public record, and noted in the references section of this report

Specific items investigated included: present and historical uses of the properties; signs of gross surface contamination; the presence of hazardous materials and wastes; above ground and underground storage tanks (AST's and UST's), and other indications of the presence of chemical contamination. These conditions may exist either on the subject property or on nearby properties to constitute an environmental liability to the owners of the property.

A site reconnaissance at the property performed on December 6, 2000, did not reveal any significant environmental problems with the property, however several relatively minor issues were identified in the Phase I Environmental Site Assessment report. The findings included:

- There were several underground fuel storage tanks on the site. These have all been removed and closed in accordance with state requirements. Residual contamination below the state's action levels may remain in the areas around the tanks. If such contamination exists and is encountered as a result of project actions, appropriate mitigation measures will be taken to alleviate the environmental impacts.

- There were approximately 400 cylinders previously used for acetylene containers that were dumped on the property after years of industrial use. The cylinders were excavated and removed. Additional cylinders may be encountered during development of the property, however these containers are not considered to be a significant hazard. If encountered, they should be double wrapped in polyethylene sheeting and disposed of at an industrial landfill.

- The property was used for an auto salvage and junk lot for a number of years. The storage and handling of vehicles and appliances may have contributed to surface soil contamination. While the site has been graded since the removal of

the vehicles and appliances, low levels of contamination may still exist in the shallow soils. If such contamination exists and is encountered as a result of project actions, appropriate mitigation measures will be taken to alleviate the environmental impacts.

- The property was used for a limestone quarry and processing plant for many years. During this operation, waste rock, air scrubber wastes, and other industrial wastes were deposited on the site. In addition, no topsoil remains on the site making it unsuitable for use for agricultural operations or landscaping without importing topsoil. The surface soils consist of crushed rock, waste concrete, and lime. While the proposed development of the site will not be for agricultural operation, it will be graded and landscaped. Necessary topsoil and other planting materials will be imported to accommodate any landscaping requirements.

- The site has been unoccupied for several years, and trash has been illegally deposited onto the site. There are several piles of waste rock, tree trimmings, tires, concrete, metal debris, and household garbage dumped around the property. The amount is estimated to be in the range of 100 – 200 cubic yards of material. Some of the material may be suitable for clean fill material, however much of the waste should be cleaned up and hauled to a landfill.

- The property is located across the street from a large municipal waste water treatment plant. During the site visits, no objectionable odors were noted, however at times this may become a problem if fugitive odors escape from the plant.

- No asbestos or lead-based paint survey was performed as a part of this ESA, however some painted surfaces in poor condition were noted in the metal warehouse building. No suspect asbestos containing building materials or friable materials were identified during the walk through of the building. Should lead-based paint be encountered as a result of project activities, appropriate mitigation measures will be undertaken to alleviate the environmental impact.

4.2 Socio-Economic Environment

4.2.1 Population data

The demographics of the Wai`anae Coast according to the 2000 Census indicates the following. With a total population of 10,506 people, the median age is 29 years, which is younger than the State median of 36 years. 9% of Wai`anae's population is under age 5, 38% under age 20, 53% between ages 20 – 65. Only 8% of Wai`anae's population is over age 65 compared to 13% for the State.

Wai`anae has a greater concentration of Pacific Islanders than the overall State statistic. 62% of the Wai`anae population consider themselves full or part Native Hawaiian and/or Other Pacific Islander compared with 23% for the entire State. 50% consider themselves full or part Asian, and 37% consider themselves white or part white. This is somewhat similar to the State's statistic of 58% being at least partly

Asian, and 39% being at least partly white. 42% of the Wai`anae population are two or more races.

Of the 2,595 households, 86 percent are families with 44% of the families having children under the age of 18, and 25% having individuals 65 years and older. 10% are single mothers. The average family/household size is 4 people, 25% more than the State average of 3. A much smaller percentage of the households are singles in Wai`anae, 14% compared to 29% for the State.

There are 2,595 housing units in Wai`anae with 330 or 11% vacant. 66% of the housing units are owner occupied and 34% are renter-occupied. The homeowner vacancy rate is 2% and the rental vacancy rate is 19%. The rental vacancy rate for Wai`anae is 57% higher than for the State, which is 8%. The median monthly mortgage in Wai`anae is $1,065 and the median monthly rent is $631. 44% of the Wai`anae households pay 35% or more of their household income toward their gross rent.

Of the population over 25 years of age, 80% have a high school degree or higher in Wai`anae, just slightly less than the State percentage of 85%. However, only 8% have a bachelor's degree or higher in Wai`anae compared to 26% for the State.

In Wai`anae, of those between the ages 21 – 64 years, 23% have a disability with 52% of those that are disabled are employed. 50% of those over 65 years have a disability. Therefore, accessibility issues are especially important in Wai`anae.

82% of the population in Wai`anae was born in Hawaii, compared to 57% for the State. Only 7% were foreign born, compared to 18% for the State. 80% of the population in Wai`anae over age 5 speaks English only.

62% of the Wai`anae population over 16 years is in the labor force. 60% of those in the labor force commute in a car, truck or van alone, 24% carpool, 8% use public transportation, 3% walk, 1% used other means, and 3% work at home. The mean travel time to work is 42 minutes. 11% of the Wai`anae population has no vehicle available, 26% have one car, 37% have two cars, and 26% have 3 or more cars.

30% of the labor force is in sales and office occupations, 21% are in service occupations, 20% are management, professional, and related occupations, 16% are in construction, extraction, and maintenance occupations, 12% are in production, transportation, and material moving occupations, and 1% are in farming, fishing, and forestry occupations. The median household income in Wai`anae is $46,717, less than the State median of $49,820. However, considering that the average Wai`anae household size is 25% more than the State average per capita income is significantly less for Wai`anae, $13,348, than for the State, $21,525. 17% of those living in poverty in Wai`anae are families compared to 8% for the State, and 20% are singles compared to 11% for the State. 7% of the Wai`anae residents have no telephone service compared to 2% for the State.

4.2.2 Surrounding Land Use and Community Character

The Wai`anae Coast is known for its great physical beauty. Stretches of white sandy beaches abut a narrow coastal plane leading deep large valleys that blanket the foothills of the majestic ridges of the Wai`anae Mountains.

The overall approach to land use and environmental planning embraces the traditional Hawai`ian culture of the ahupua`a system. The ahupua`a is an ancient form of land division that usually stretched from the tops of the mountains down to the fishing and gathering waters of the sea. Along the Wai`anae coast, the ahupua`a are strongly defined by the steep-walled valleys with their natural systems of streams, together with their associated historic and cultural ties to the early Hawai`ian settlers. Awareness and respect for those boundaries continues to be important even today where the ahupua`a divisions are still recognized by many of the residents as important definers of community boundaries. Many of the local people feel a strong identity with their ahupua`a, and *Ahupua`a Councils* have been formed formed for the four major populated valleys: Nanakuli, Lualualei, Wai`anae, and Makaha. The concept of the ahupua`a has great significance and importance in the Wai`anae District in terms of natural landscape form, historic patterns of land use, traditional social and cultural practices, contemporary customs, and recent community organization.

Almost all of the existing urban and suburban development in the Wai`anae District is clustered along the Farrington Highway corridor. The community has identified a need for community gathering places in each of the major ahupua`a that are different from the predominantly retail commercial Country Town and Village Centers. These would be open areas with perhaps a few small buildings where people can gather informally and visit and talk story; have parties and celebrations; stage festivals and special events; teach and learn crafts, music and dance; buy, sell, and barter homegrown produce and homemade items; and generally renew contact with friends and neighbors. Ideally they should be close to the Country Town or Village Centers, but off of the very busy Farrington Highway, and within the residential communities.

The core values of Wai`anae as identified in the Wai`anae Sustainable Communities Plan published in July 2000 are as follows:

- Ours is a living culture of the land and the sea.
- Relationships are fundamental to our values and identity.
- We are a rural community.
- We are a community with small town values.
- We value economic choices in Wai`anae.
- Our elderly have much to teach us.
- We cherish our children.

4.3 Public Facilities and Services

4.3.1 Schools and Recreational Facilities

The project site is in close proximity to 5 elementary schools: Makaha, Wai`anae, Leihoku, Kamaile and Ma`ili Elementary Schools, plus Wai`anae Intermediate School and Wai`anae High School, all operated by the State Department of Education. None of these will be adversely affected by the project.

Diverse recreational opportunities are available in the Wai`anae area, which also contains the world-renowned Makaha Beach. There are several beach parks: Ma`ili, Lualualei, Pokai Bay, Mauna Lahilahi, and Makaha Beach Parks. Other recreational facilities include the regional park, Wai`anae District Park; the undeveloped Wai`anae Regional Park; three community parks, Wai`anae Piliaau Field, Ma`ili Playground, and Makaha Valley Park; two boat harbors, Pokai Bay Boat Harbor and Wai`anae Boat Harbor; two golf courses, Makaha Golf Club and Makaha Valley Country Club; and the future home of the Wai`anae YMCA not yet under construction, but already up and running for field events.

4.3.2 Police and Fire Protection

The project area is served by the Wai`anae Police Station located at 85-939 Farrington Highway, and Fire Station #26 located at 85-645 Farrington Highway. The proposed project should have no negative impacts on police and fire protection services.

4.3.3 Medical and Health Facilities

There are several medical facilities in the area including, Kaiser Ma`ili Clinic, Wai`anae Coast Comprehensive Health Center and Satellite; however there is no major hospital nearby. The proposed project should not negatively impact the medical facilities.

4.3.4 Transportation and Accessibility

There is only one major highway that serves the Wai`anae Coast: Farrington Highway. Vehicular access to the project site would be from Leihoku Street off of Farrington Highway. There will be development of a new one-way road for exclusive use by buses and para-transit vehicles to enter the site and circle an "island" for passengers to board and alight the buses. Additionally, a new two-way road to access parking at the rear of the project development and to the undeveloped property at the interior of the site will be part of the proposed development.

Existing pedestrian walkways situated along the south side of the property will continue to serve as ingress and egress routes. New pedestrian walkways will be incorporated into the site along with landscaping to beautify and enhance the transit "island."

4.3.5 Water and Sewer

Water and sewer services are discussed under Sections 4.1.9 and 4.1.10 respectively.

4.3.6 Ground Drainage

Sitework hardscape for the proposed development will mostly be asphalt concrete paving and concrete sidewalks. The landscape design will utilize xeriscape element, along with some drought resistant, salt-air climate, wind tolerant shade trees. The landscaping will help with possible effects of erosion, though the proposed development will require that the site be graded and/or backfilled to be relatively flat.

There is a 66" drain line that travels along the front of the property along Leihoku Street, with a 30" line that leads to the property with a stub-out at the existing driveway. The property gradually slopes from a higher elevation on the east side of the property down toward the west. The proposed project will probably need to tap into the drain line from the western end of the property. A drainage plan will be developed during the design phase of the proposed project.

4.3.7 Solid Waste

Assuming that the City and County of Honolulu will maintain the site, refuse collection will also be provided by the City and County of Honolulu. Should the Department of Transportation Services contract site maintenance out to a private vendor, the private vendor will be responsible for refuse removal.

4.3.8 Electrical, Telephone and Cable Service

Electrical services for the proposed facility will be provided by Hawaiian Electric Company. Verizon Hawaii or other private telephone service provider of the City and County of Honolulu's choosing would provide telephone services.

5. Relationship To Federal, State and City & County Land Use Plans and Policies

5.1 Federal

5.1.1 National Environmental Policy Act

The proposed project complies with the intent of the laws and regulations under NEPA and is consistent with the Federal Transit Administration (FTA) environmental policy. Pursuant to Title 23--Highways, of the Code of Federal Regulations, Part 771—Environmental Impact and Related Procedures, Section 771.117 Categorical Exemptions, the scope of this project appears to meet the requirements that qualify it for a categorical exclusion (CE) as defined in 40 CFR 1508.4. Specifically, item (d) states:

> "Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result. Examples of such include but are not limited to: . . . (10) Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic."

5.1.2 Americans with Disabilities Act

The Americans with Disabilities Act (ADA) of 1990 provides guidelines for development of accessibility to buildings and facilities by individuals with disabilities. The proposed community transit center will apply these guidelines during the design, construction and operation of the center.

5.2 State of Hawaii

5.2.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes) provides a guide for the future of Hawaii by setting forth a broad range of goals, objectives, and policies. These serve as guidelines for growth and development of the State of Hawaii. The proposed project is consistent with the Hawaii State Plan.

Section 226-13: Physical Environment – Land, Air and Water Quality. The proposed community transit center will achieve the objective of planning for the State's physical environment by pursuing development activities in a manner that is compatible to the surrounding Wai`anae community and consistent with the Federal, State and County regulations.

5.2.2 State Functional Plans

The Hawaii State Functional Plan (Chapter 226) provides a management program that allows judicious use of the State's natural resources to improve current conditions and attend to various societal issues and trends. The proposed project is generally consistent with the State Functional Plans.

5.2.3 State Land Use Law

The State Land Use Commission classifies the subject property as Urban. The proposed community transit center conforms to the State Urban classification of Chapter 205, Hawaii Revised Statutes and State of Hawaii Land Use Commission Rules (Hawaii Revised Statutes, Chapter 205; Hawaii Administrative Rules, Title 15, Subtitle 3, Chapter 15).

5.2.4 Coastal Zone Management Act

The proposed community transit center is not located on the coastline or shoreline and does not involve coastal resources. In any event, the facility will be designed in a manner consistent with the intent of the Coastal Zone Management Act.

5.3 City & County of Honolulu

5.3.1 General Plan

The City & County General Plan provides a statement of long range social, economic, environmental, and design objectives for the Island of Oahu. It also includes a statement of polices necessary to meet these objectives. The proposed Mililani Community Transit Center is consistent with, and supports the following objective and policies of the General Plan:

Objective A "To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel."

Policy 1: "Develop and maintain an integrated ground transportation system consisting of the following elements and their primary purposes:

a. Public transportation – for travel to and from work, and travel within Central Honolulu;
b. Roads and highways, for commercial traffic and travel in nonurban areas;
c. Bikeways – for recreational activities and trips to work, schools, shopping centers, and community facilities; and
d. Pedestrian walkways – for getting around Downtown and Waikiki, and for trips to schools, parks, and shopping centers."

Policy 3: "Provide transportation services outside Ewa, Central Oahu, and Pearl City-Hawaii Kai corridors primarily through a system of express and feeder buses as well as through the highway system with limited to moderate improvements sufficient to meet the needs of the communities being served."

Policy 9: "Promote programs to reduce the dependence on the use of automobiles."

5.3.2 Wai`anae Sustainable Communities Plan

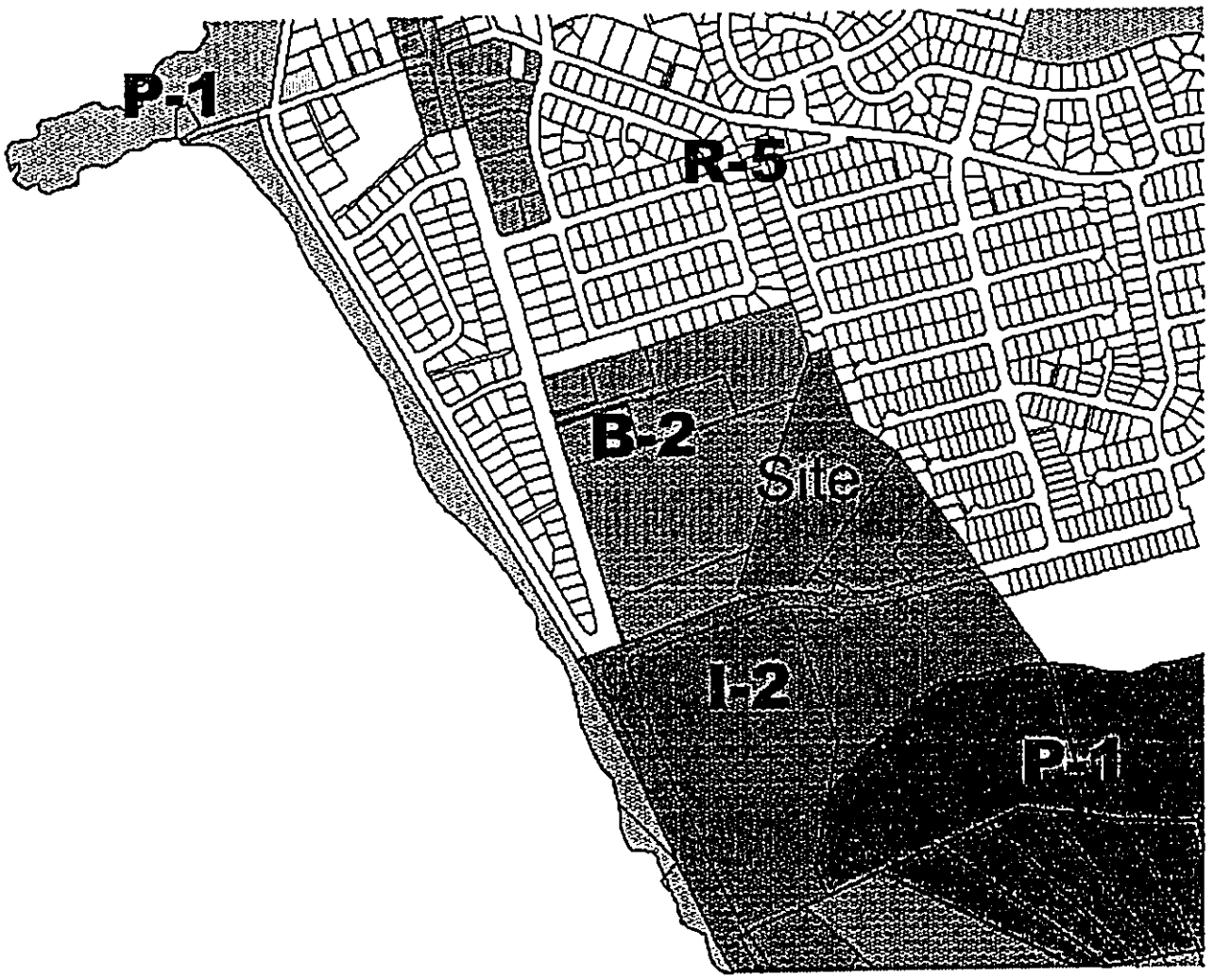
The Wai`anae Sustainable Communities Plan, adopted in May 2000, provides conceptual, long-range visions and policies to guide land use and infrastructure decisions for a region that stretches from Nanakuli to Kaena Point. The Plan seeks to preserve the region's country character by providing guidance to preserve and enhance the natural, recreational and cultural resources, and maintain and enhance the rural character of Wai`anae's residential neighborhoods and commercial areas. The proposed project is consistent with the objectives, policies and guidelines of the Wai`anae *Sustainable* Communities Plan.

Additionally, a revision of the Wai`anae Public Infrastructure Map (PIM) to add a symbol for the Wai`anae Community Transit Center and Park and Ride Facility (2001/PIM-7) was adopted on August 9, 2000 by the City Council as Resolution 2000-121.

5.3.3 Zoning Designation

The Land Use Ordinance Map identifies the proposed site as I-2, Intensive Industrial. See Figure 10. Public uses such as the proposed transit center are permitted in the I-2 zone.

Figure 10: Zoning Map



6.1 NO ACTION

If the Wai`anae Coast Community Transit Center was not built, transit services would continue to operate informally on Farrington Highway in front of the Wai`anae Mall. The potential danger of having passengers cross the busy street to catch the town-bound bus would continue to exist. There would be minimal facility to accommodate a park and ride approach to commuting. There would be no expenditure of public funds, and currently vacant land adjacent to the Wai`anae Mall would remain un-improved except for the existing abandoned metal shed structure and lime mill. It would probably continue to be used as a dumping site for unusable household and automotive items such as mattresses, tires, etc. as well as a campground for vagrants, making it a public nuisance. In time the subject site may be developed, probably either subdivided and made into an industrial park or perhaps developed for a singular industrial use.

6.2 DELAYING THE PROJECT

If the Wai`anae Coast Community Transit Center were delayed, transit services would continue to operate informally on Farrington Highway in front of the Wai`anae Mall. As in the "No Action" alternative, the potential danger of having passengers cross the busy street to catch the town-bound bus would continue to exist.

6.3 ALTERNATIVE SITES

Several alternative sites were identified and presented at a community meeting, including the site of the Comet Store in Makaha Valley, the Hawaii Housing Authority site across Farrington Highway from the Wai`anae Fire Station, and the site of the former Shell gas station at Lualualei Homestead Road. Pros and cons of each site were discussed, as well as other sites raised by the community. Based on priorities, desirable qualities when locating the site as well as desirable qualities of a transit center, the community eliminated all other sites as not being as suitable for various reasons as the proposed Renton property mauka of the Wai`anae Mall. They desired a site that had access to a variety of services such as retail, banking, and even health services. There was a desire that the center have certain amenities provided such as vending machines, an ATM, restroom facilities, drinking fountains, and a sense of security. It became clear to the majority of the group that the Renton property was the most ideal.

6.4 RECOMMENDED ACTION

The recommended action is to proceed with the proposed transit center on the selected site.

7. Relationship Between Local Short-term Uses and the Maintenance and Enhancement of Long-term Productivity

No short-term exploitation of resources resulting from the proposed transit center will have long term adverse consequences. Major impacts such as increased bus and pedestrian traffic to the site will increase noise and emission levels. However, recent studies show that no measurable negative impacts on air quality will occur with the proposed project.

Long-term gains will be the increased consumer use of the commercial entities surrounding the site. The convergence of different public services and commercial entities within walking distance to the site increases the accessibility of public services to the community, and the use of public transport is encouraged.

8. IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES BY THE PROPOSED ACTION

Development of the proposed facility will involve the irretrievable loss of certain environmental and fiscal resources. However the costs associated with the use of these resources should be evaluated in light of the long term benefits to residents of the Wai`anae Coast, the City & County of Honolulu and the State.

9.1 IMPACTS TO PHYSICAL ENVIRONMENT

9.1.1 Traffic

In Wai`anae, hub services have already been implemented and will only change by being re-routed to the transit center on Leihoku Street. From an operational perspective, bus service in Wai`anae will remain relatively unchanged once the Transit Center comes on-line.

Traffic along Farrington Highway in Wai`anae in front of the Wai`anae Mall where the buses are currently informally operating as a transit center is heavily congested especially during the peak commute times. However there are relatively insignificant volumes moving from Leihoku Street or turning left onto Leihoku Street from southbound Farrington Highway resulting in few interruptions or delays for through traffic. Moving the Transit Center off of the highly congested Farrington Highway will actually help to alleviate traffic and increase pedestrian safety. The impact of increased traffic on Leihoku street will be minimal, as it is confined to the first 45 feet from the intersection at Farrington Highway.

There will be a temporary short-term impact on traffic resulting from construction related activities that would only last during the construction period. Traffic controls and other standard construction mitigation measures will be taken to alleviate the construction related impacts. The extent of the construction impacts should not be adverse.

Completion of the Transit Center should not adversely impact traffic within the project area. No levels of service or operational impacts are associated with this plan. See Appendix B, Traffic Impact Analysis and Environmental Analysis for a full report.

9.1.2 Air Quality and Noise

Development of the transit center will impact the air quality and noise at intervals when the buses pulse at the site due to the bus emissions. However, because the routes will be coordinated so that, ideally, all City buses will come together at the same time and depart at the same time, the impact of their emissions will also be pulsed, concentrated when the buses are on site, then clear when the buses depart. The addition of cars either parking at the site or dropping off/picking-up passengers may also add slightly to the air quality. The resulting increase in the air pollution due to bus emission was found to be relatively smaller than the significant emission rates as defined in the Hawai`i Administrative Rules. Currently buses and private vehicles are traveling along Farrington Highway; therefore it is unlikely that any measurable impacts on air quality or noise will occur. Since the buses are currently operating on Farrington Highway in front of the Wai`anae Mall, the air quality and noise basically being diverted instead to the rear of the mall.

There will be temporary short-term impacts to the air quality and noise associated with the construction related activities. Standard construction mitigation measures will be taken to alleviate construction related impacts. The extent of these temporary impacts should be minimal and not be adverse.

Implementing any air quality or noise mitigation measures for long-term impacts from the proposed project is probably unnecessary and unwarranted. Refer to Appendix C, Air Quality Environmental Assessment Final Report for the full report.

9.1.3 Drainage and Erosion

It is anticipated that on-site run-off from the proposed project site will not have an adverse impact to the adjacent and downstream properties. A drainage plan will be developed during the design phase of the proposed project.

9.1.4 Flora and Fauna

There are no significant trees, and the existing flora and fauna are small, introduced species. The proposed development should not have an adverse impact on the flora and fauna. Once the project is landscaped, it should have a positive impact on the flora. Xeriscape tropical plants will ornament and beautify the site that will be irrigated to aid its success in establishing itself. There should not be an adverse impact to the fauna.

9.1.5 Wetlands

The project site is not deemed to be in a wetland or conservation area.

9.1.6 Scenic, Aesthetic and Open Space Resources

The impact on scenic, aesthetic and open space resources by the proposed project should be positive. The mostly vacant and unimproved land currently has an abandoned metal shed structure and lime mill. As such it is attractive as a dumping site for unusable household and automotive items such as mattresses, tires, etc. as well as a campground for vagrants.

The proposed project will beautify the area with mostly one story structures designed to be reminiscent of an ancient Hawaiian village. The tallest structure will be a clock tower that will have an approximately 4 foot square, 10 foot tall base. It will stand approximately 28 feet high and be made of steel frame open truss above a moss rock base topped by an approximately 3 foot diameter clock. The central and main area of the proposed project will mostly be open space landscaped with ground cover and trees and meandering walkways. The low profile and loose density of structures on the site will allow for sightlines to the ocean and to the mountains with relatively little obstruction for any future development on the surrounding vacant land and existing development.

9.1.7 Historic and Cultural Resources

Due to the disturbed nature of the existing site, it is highly unlikely that there will be an adverse impact on historic and cultural resources. Should items of important

archaeological significance be encountered during construction, work will stop and appropriate mitigation measures will be taken to preserve the findings.

9.2 Impacts to Community Environment

9.2.1 Population and Local Economy

The "spoke" portion of the Hub and Spoke transit system has already informally been implemented in the Wai`anae community on Farrington Highway in front of the Wai`anae Mall. The proposed development would basically be moving the current informal hub in front of the mall off of the main highway to just behind the mall. It should be an easier site to access for park and ride and "kiss and ride" passengers, as well as be easier for the disabled to access. However, offsetting those benefits would be the fact that the proposed transit center, being off of the main highway, would not be as visible as the informal one operating on the main highway. It is yet to be determined how these positive and negative effects will ultimately make an impact on the local economy. The proposed project should have no adverse impact on the population.

9.2.2 Public Services

The proposed improvements should have a negligible impact on public services such as medical facilities, recreational facilities and schools. However, there may be a possible increase in need for fire protection, and assuredly police protection services. With a formal transit center, there will be structures that may possibly require fire protection. Additionally, with the proposed transit center located off of the main highway, and having improvements, there will be an increased need for security measures impacting police protection services. The design will utilize defensible space ideas such as good lighting, minimizing hiding places, etc. as well as vandal resistant materials to help alleviate the enhanced security requirements. Additionally, it will provide provisions for security cameras to be installed to help monitor the site.

9.2.3 Infrastructure and Utilities

The proposed improvements will have a negligible impact on roadway, water, power and solid waste disposal systems. The current informal site does not have any improvements such as landscaping and a comfort station, therefore there will be an increased load on water and power demand and a requirement to address solid waste disposal. However, the impact of such services is minimal. While the Board of Water Supply believes that the existing waterlines are sufficient for the site, water service availability will be determined once permits are applied for and will be based on the demand and existing capacity at that time. As much as possible, solar energy will be incorporated for use in the design. The procedure for solid waste disposal will be determined at a later date. It will either be provided by the City and County of Honolulu or contracted to a private vendor.

9.2.4 Environmental Justice

The proposed project is consistent with Title VI of the 1964 Civil Rights Act and Executive Order 12898 on Environmental Justice, requiring that all program and project actions and decisions ensure that minority and low-income populations are not

disproportionately adversely affected by transportation programs or projects. The proposed project would enhance services for all people currently served by public transportation and make it more appealing for those not yet using public transportation without exclusion to one's social or economic status or physical mobility.

9.3 Need for Environmental Impact Statement

Because no long-term adverse impacts are anticipated to the proposed project, an Environmental Impact Statement is not required.

9.4 Significance

According to the Department of Health Rules (Chapter 11-200-12), the proposing agency must determine whether an action may have a significant impact on the environment. These would include (1) all phases of the project; (2) its expected primary and secondary consequences; (3) its cumulative impact with other projects; and (4) its short and long-term effects. The Rules establish Significance Criteria to be used as a basis for identifying whether significant environmental impacts will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any of the following criteria.

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resources.* The project will not require the loss or destruction of any natural or cultural resource, but will encourage conservation of non-renewal resources such as oil-based fuel.

2. *Curtails the range of beneficial uses of the environment.* The project will be built on previously developed land. Therefore, it will not negatively impact other beneficial uses such as recreation.

3. *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.* The project does not conflict with any long term environmental policies, goals and guidelines.

4. *Substantially affects the economic or social welfare of the community or State.* The project could have a positive effect on the economic welfare of the community by reducing the residents' use of non-renewable fuel sources.

5. *Substantially affects public health.* The project will improve public health by encouraging use of public transport--thus reducing use of private automobiles and the resulting air emissions generated. It will also encourage residents to access public services located around the transit center on foot—which will contribute to a healthier and active lifestyle.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities.* The project will not have significant adverse secondary impacts on public facilities.

7. *Involves a substantial degradation of environmental quality.* The project will not substantially degrade the environmental quality. Existing trees will be retained or replaced and the structures on site will adhere to zoning height requirements, thus preserving public view planes.

8. *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions.* The project is part of an islandwide system of transit centers, however, the development will not have a considerable impact on the environment.

9. *Substantially affects a rare, threatened or endangered species or its habitat.* The project will not affect rare, threatened or endangered species or habitat.

10. *Detrimentally affects air or water quality or ambient noise levels.* The project will not detrimentally impact air or water quality.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater or coastal waters.* The project will not be developed in an environmentally sensitive area.

12. *Substantially affects scenic vistas and view planes identified in County or State plans or studies.* The project will not impact any scenic or view planes.

13. *Requires substantial energy consumption.* The project will not require substantial energy consumption to complete. In fact, when in operation, the project will reduce the consumption of non-renewal fuel sources typically used by automobiles.

10.1 FEDERAL

A Federal permit may be required in response to Section 401(a)(1) of the Federal Water Pollution Act, commonly known as the Clean Water Act.

10.2 STATE OF HAWAII

The State requires the preparation of an Environmental Assessment. If the state provisions are addressed, the applicant can determine that an Environmental Impact Statement (EIS) will not be required, and can then issue a FONSI (Finding of No Significant Impact) for this project.

10.3 CITY & COUNTY OF HONOLULU

All related development plans have been amended to reflect the proposed action. Prior to obtaining the building permit, it will be necessary to secure all applicable reviews and approvals from regulating agencies. The following permits will be required prior to implementation: demolition, grubbing, stockpiling, grading, building, and right-of-way.

11. Anticipated Determination

Based on the information described in this document, the proposed project is not expected to result in any significant social, economic, cultural, or environmental impacts. Consequently, a finding of no significant impact is anticipated pursuant to provisions of Subchapter 6 of Chapter 200, Title 11, Hawaii Administrative Rules of the Department of Heath.

12. Agencies and Parties Consulted in Preparation of the Environmental Assessment

The following persons or agencies were contacted during the preparation of the Environmental Assessment:

1. Board of Water Supply

2. Department of Hawai`ian Homelands

3. Department of Land and Natural Resources
   State Historic Preservation Division
   Division of Boating and Ocean Recreation
   Division of State Parks
   Commission on Water Resource Management
   Division of Forestry & Wildlife
   Land Division Branches
   O`ahu District Land Office

4. Hawai`i State Meteorologist

Pre-consultation responses were received from the following:

Hawaii Department of Health
Hawaii Department of Land & Natural Resources, Historic Preservation & Land Divisions
Hawaii Department of Transportation
C&C Honolulu Department of Transportation Services
C&C Department of Parks & Recreation
C&C Honolulu Fire Department
C&C Board of Water Supply
C&C Police Department

Chang, Muncel, Salt Water vs. Fresh Water – Ghyben-Herzberg Lens, http://geography.about.com/library/misc/ucghyben.htm, Department of Geography, Butte College (California), September 19, 2000.

Department of General Planning, City and County of Honolulu, General Plan Objectives and Policies, 1992.

Department of Planning and Permitting, City and County of Honolulu, Revised Ordinances of Honolulu, 1999.

Department of Planning and Permitting, City and County of Honolulu, Wai`anae *Sustainable* Communities Plan, July 2000.

Department of Transportation Services, City and County of Honolulu, O`ahu Trans 2K, Islandwide Mobility Concept Plan, March 1999.

Federal Emergency Management Agency, Flood Insurance Rate Map, City and County of Honolulu, Hawaii, Panel 100 of 135, Community-Panel Number 15001 0100 C, Revised September 28, 1990.

Federal Highway Administration, Environmental Policy Statement 1994, A Framework to Strengthen the Linkage Between Environmental and Highway Policy, http://www.fhwa.dot.gov/environment/nepa/epsfinal.htm

The Fuel Oil Polishing Company of Hawaii, Soil Boring/Sampling Investigation for UST Closure, March 29, 2000.

Gale Research Company, Climates of the States, National Oceanic and Atmospheric Administration Narrative Summaries, Tables, and Maps for Each State with Overview of State Climatologist Programs, Third Edition, Volume 2.

Gale Research Inc., The Weather Almanac, Sixth Edition, 1992.

R.M. Towill Corporation, Phase I – Environmental Site Assessment, December 2000.

State of Hawaii, Dept. of Business, Economic Development & Tourism, Research and Economic Analysis Division, Census 2000, http://www.hawaii.gov/dbedt/sdcrpt.html

State of Hawaii, Hawaii State Legislature, 2001 Hawaii Revised Statutes, http://www.capitol.hawaii.gov/hrscurrent/?press1=docs

U.S. Government Printing Office, Code of Federal Regulations, Title 23, Volume 1, CITE: 23CFR771.117, Revised as of April 1, 2000.

APPENDICES

A. An Archaeological and Cultural Impact Evaluation for the Proposed Wai`anae Community Transit Center, Lualualei *Ahupua`a*, Wai`anae District, O`ahu (TMK 8-6-1:29, prepared by Cultural Surveys Hawai`i, Inc., June 2002.

B. Traffic Impact Analysis and Environmental Analysis, prepared by Parsons Transportation Group, Inc., June 2002.

C. Air Quality Environmental Assessment Final Report, prepared by The Environmental Company, Inc., June 2002.

D. Pre-Consultation Comment Letters and Responses

E. Draft Environmental Assessment Comment Letters and Responses

APPENDIX A

An Archaeological and Cultural Impact Evaluation for the Proposed Wai`anae Community Transit Center, Lualualei *Ahupua`a*, Wai`anae District, O`ahu (TMK 8-6-1:29)

Prepared by Cultural Surveys Hawai`i, Inc., June 2002

An Archaeological and Cultural Impact Evaluation for the Proposed Wai`anae Community Transit Center, Lualualei *Ahupua`a*, Wai`anae District, O`ahu (TMK 8-6-1: 29)

by

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Prepared for

AM Partners, Inc.

by
Cultural Surveys Hawai`i, Inc.
June 2002

ABSTRACT

Historical background research including mythological accounts, LCA documentation, and previous archaeological research suggests that Lualualei *Ahupua`a* was initially occupied by the 15th century with settlement continuing likely until the early 19th century. Within the project area, however, extensive quarrying activities in the past 70 years have significantly altered the original landscape, removing any traditional Hawaiian sites which may have existed.

The proposed Wai`anae Community Transit Center lies in an area which has undergone extensive land altering activities with the current land surface appearing to have been extensively mined and grubbed over the previous century, rendering it relatively free of surface and subsurface archaeological resources.

The area's history of commercial lime quarrying and associated activities has distorted or terminated native cultural practices, if any, that formerly pertained to the project area parcel. There is no evidence of any cultural practices – including burials, trails, hunting, gathering, and cultural sites – formerly associated specifically with the parcel, nor is there evidence of any ongoing cultural practices.

Based on the above findings, this study concludes that there will be no adverse impact to historical or cultural resources by the implementation of the transit center project.

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I. INTRODUCTION

A. Project Background

The Department of Transportation Services has proposed the construction of the Wai`anae Community Transit Center located at 86-052 Leihoku Street in Wai`anae, immediately east of Wai`anae Mall (Figures 1&2). The current owner, Lenakona, Inc., has made the 7.69-acre parcel available for purchase, approximately 2.8-acres of which would be utilized for the proposed transit center. The center is proposed to provide parking, bus bays, and other structures surrounded by the bus bays and driveways.

This report documents the historical background and previous archaeological research in the *ahupua`a* of Lualualei and in the vicinity of the proposed transit center parcel. The report also assesses the archaeological and cultural impact of the proposed transit center project.

Cultural Surveys Hawai`i, Inc.(CSH) was contracted by AM Partners, Inc. to conduct this assessment in May of 2002.

B. Project Area Description

The proposed site for the Wai`anae Community Transit Center is in Lualualei Valley (*Ahupua`a* of Lualualei), on the leeward side of O`ahu, within the Wai`anae District. The project area is currently zoned I-2 (industrial) and is surrounded by the Wai`anae Mall to the west (*makai*), residential housing to the north and east (*mauka*), the Waianae Waste Water Treatment Plant (WWTP) across Leihoku Street to the southwest and the Waianae YMCA site to the south. The site is currently "mostly vacant except for an existing metal warehouse structure, some fencing, and materials (green waste, furniture, trash, etc)" (AMP Project No. A0096.20; Fax Memorandum).

The proposed Wai`anae Community Transit Center covers an area of approximately 2.8-acres, measuring approximately 500 ft by 350 ft within (TMK 8-6-01:por. 29) and lying approximately 500 m from the coastline. The elevation of the parcel is less than 20 feet AMSL and receives an annual rainfall of 20-30 inches (Juvic and Juvic, 1998:56). Nānākuli Valley is cut into the eroded remnants of the Wai`anae shield volcano, the first volcano to form what is now O`ahu (Abbott, Macdonald, Peterson 1983; 426). The project area is dominated by vertisols which are common to dry areas such as Wai`anae. These soils are typically found on talus slopes and dissected valleys. "The tendency of Vertisols to shrink and swell with wetting and drying can be hazardous to overlying construction" (Juvic and Juvic, 1998:92).

The prevailing winds in the area are the northeast trades that blow over the Ko`olau mountains then continue over the Wai`anae range and head out over the southwest potion of the island (Juvik and Juvik 1998; 55). This wind pattern is responsible for the relatively low rainfall averages on the leeward side of the island. The winds cause the rain to hit the Ko`olau Range first releasing most of their moisture there and then continue on over the Wai`anae Range releasing what moisture may be left (Abbott, Macdonald, Peterson 1983; 224). Temperatures in the area range from 65-88 degrees

Figure 1 A Portion of the USGS Waianae Quad Showing the Location of the Proposed Wai`anae Community Transit Center

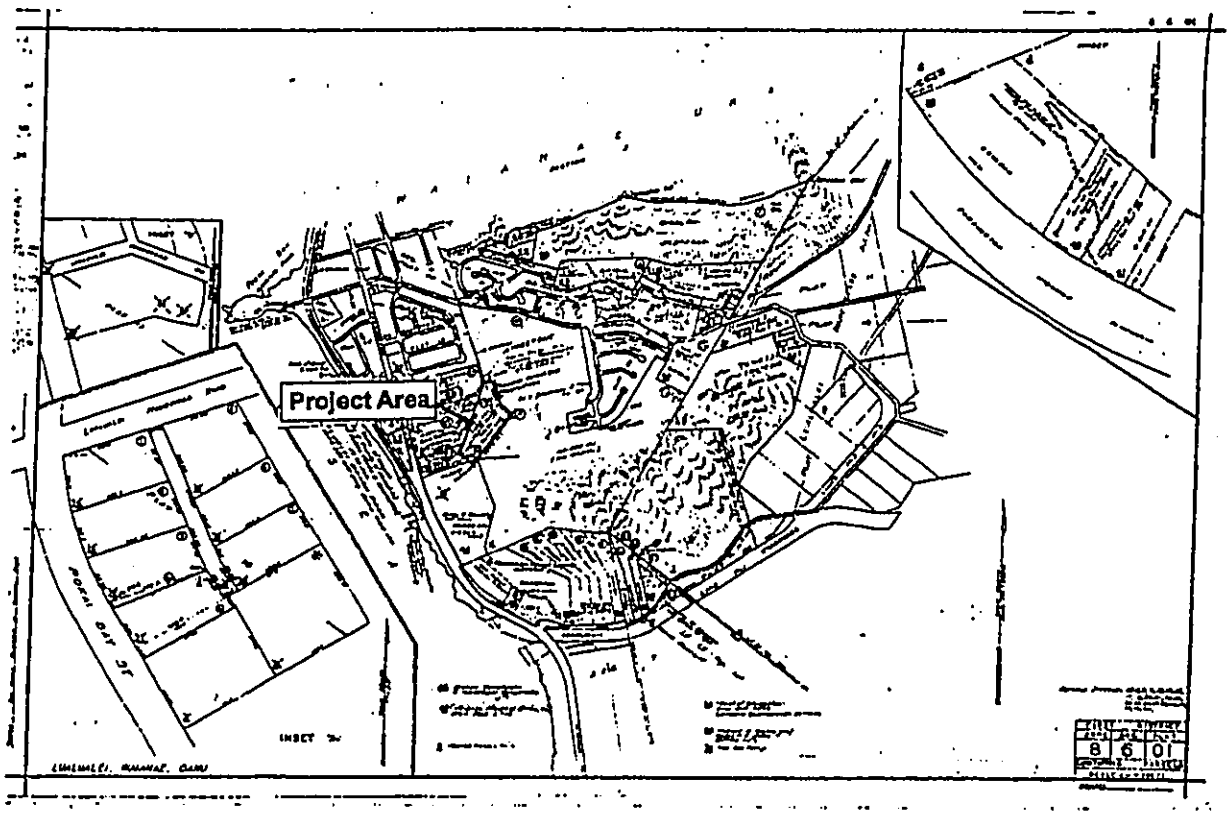


Figure 2 TMK 8-6-01 Showing Location of the Project Area

Fahrenheit in January to 70-95 degrees Fahrenheit in July (UH-Department of Geography [Armstrong ed.] 1973; 58).

Before the introduction of the exotic species with Western contact, the native ecosystems of the area consisted of lowland dry and mesic forests, lowland dry shrub lands, and grasslands. These areas range from warm to very hot and dry. Today the entire area has been altered by human activity (Juvik and Juvik 1998; 122-123).

The soils in the project area consist of Mamala stoney silty clay loam, 0-12 percent slopes and Mokuleia clay which is nearly level. The Mamala soil is particularly stony, and in order to be cultivated the stones must be removed (Foote et al 1972; 93 and 95).

C. Methodology

An archaeological field inspection of the project area was conducted in April 2002 by CSH archaeologist David Shideler.

Background research included a review of archaeological studies in the library of the State Historic Preservation Division; document searches at the Hawai`i State Archives; the Mission Houses Museum Library; the Hawai`i Public Library; the libraries of the University of Hawai`i-Mānoa; and the Archives of the Bishop Museum; and a study of maps at the Survey Office of the Department of Accounting and General Services.

II. CULTURAL AND HISTORIC BACKGROUND

The present study area is located within Lualualei *ahupua`a* in the district of Wai`anae. Clues to the history of land use and activity within the *ahupua`a* are found in preserved records including journals, government records, scholarly studies, memoirs, archaeological studies, maps, historic photographs, and oral histories. The earliest records present glimpses of landmarks and events within the general Wai`anae area. By the middle decades of the 19th century, it is possible to focus more precisely on the study area as documentation becomes more abundant and specific.

A. Pre-Contact to 1800

Traditional accounts of Lualualei focus on mythology of the demi-god Maui. Samuel Kamakau (1961) cites `Aloha Stream (approximately 5 km south of the project area) at the coast of Lualualei as the birthplace of the Polynesian demi-god Maui and his brothers: it was here that Maui learned the secret of making fire for mankind and perfected his fishing skills. Other famous accounts of Maui at `Ulehawa Stream refer to: the cave in which Hina (moon goddess, mother of Maui) made her tapa; the fishhook, Manai-a-ka-lani (with which Maui attempted to unite the Hawaiian Islands); the snare for catching the sun (which Maui used to advantage on Haleakala); and the place where Maui's adzes were made.

B. Maui Legends (O`ahu)

`Aloha was the birthplace of Māui and the origin of the Māui legends. (Puku`i, Elbert & Mo`okini 1976:215) Kamakau tells us that Maui's genealogy can be traced from the `Ulu line thru Nana`ie and says:

> . . . Wawena lived with Hina-mahuia, and Akalana, a male, was born; Akalana lived with Hina-kawea, and Māui-mua, Māui-waena, Māui-ki`iki`i, and Māui-akalana, all males, were born.
>
> `Ulehawa and Ka`ōlae, on the south side of Wai`anae, O`ahu, was their birthplace. There may be seen the things left by Māui-akalana and other famous things: the tapa-beating cave of Hina, the fishhook called Mānai-a-kalani, the snare for catching the sun, and the places where Māui's adzes were made and where he did his deeds. However, Māui-akalana went to Kahiki after the birth of his children in Hawai`i. (Kamakau 1991:136)

The Māui rock, Site 148 in McAllister's *Archaeology of O`ahu*, is currently located at 87-1550 Farrington Highway in Lualualei. In 1930 when McAllister conducted his fieldwork he noted:

> The large rock is now split in half and adorned with many small, oddly shaped rocks. It is said to be bad fortune to build one's house across a line drawn directly from the rock to the shore. (1933:110)

Maui and Fire

> Many stories are told about how people of old obtained fire. . . . According to another story familiar to all, fire was obtained by Maui, son of Kalana from the Mud-hen-of-Hina. People at first had fire; it was a continuous fire from the god. The gods took away the fire from men; Maui-a-Kalana therefore sought the source of fire and found it in the *mapele.* The owner of the fire was a woman. She was `Alae-huapipi and she had the fire in the *mapele* and this was the fire called the fire of Pele (ahi Pele). Two women, `Alaeniuahina and `Alae-huapipi, had the fire in the *mapele* and from them fire was obtained. From that time men had fire. The source of fire was in the possession of these two double-bodied women who could take bird form, hence Maui kept watch of them in order to find out the source of fire.
>
> Maui-a-Kalana was once living seaward of `Aloha at Wai`anae and saw these two women toasting bananas in the valley of Poho-a-`alae. One woman was saying, "Hina's cock of a son is swift!" when, just as they were speaking, Maui stood before them. The two women transformed themselves into their `e`epa bodies. Maui caught the head of `Alaehuapipi, but her companion was quick enough to save herself, and the selfish woman called out, "O, `Alaehuapipi, hide the fire!" Maui said, "Show me how fire is obtained. If you conceal the matter I will kill you!", and he held her body dangling by the head with the wings crossed at the back. Fearing that she was about to die, she told him that the *mapele* fire was hidden in the hollow of a rock. It was called the *mapele* because of the two, three, and four women who were rubbing sticks for fire; and after Maui had found that the fire was in the wood, he found a spark within two sticks of wood rubbed together.

(Sterling & Summers 1978:64-5, citing to S. M. Kamakau, *Mo`olele Hawaii*, vol. I, Chapter 5, page 45.)

Maui's Flying Expedition

> (Synopsis) One day Maui and his brothers went fishing again in the sea of `Aloha. They each let down their hooks but caught only sharks. Maui then let down his famous hook, Manaiakalani and caught a *mio* and *ulua.* Maui then gave the order to paddle to shore where he took the fishing tackle gourd and *hokeo* (his paddle) to his mother Hina. The fish he took to the *heiau* Lua`ehu because he had to eat it there.
>
> He began to eat the fish from the head and had reached almost the tail when he looked towards Pohakea and saw the chief Peapeamakawalu (eight eyed Pea-pea) carrying off his wife Kumu-lama. He left the tail of the fish and pursued Pea-pea. Unable to overtake Pea-pea who had disappeared into the sky beyond the sea he returned to mourning to the *heiau*, where he had left the fish tail, but it had disappeared.
>
> Weeping he returned to his mother Hina who told him to rest first and then to go to the land of Ke`ahumoa where he would find Ku`olokele his grandfather who would further instruct him as to how to recover his wife.

Maui went as directed, not finding his grandfather in the hut he looked in the potato field on the other side of Pohakea but saw no one. Then from a hill he saw coming toward Waipahu a man "with a load of potato leaves, one pack of which, it is said would cover the whole land of Ke`ahumoa." When this man, Ku`olokele, reached the stream he laid down his bundle and Maui seeing he was hunched backed, picked up a stone and threw it at him. The stone hit the old man on the back and immediately his back was straightened. He then picked up the stone and threw it on Waipahu where it is to this day.

Ku`olokele picked up his bundle and went to meet Maui. When they arrived at the hut he asked Maui his errand and on being told he directed Maui to go and catch birds for feathers and gather *ki* leaves and *`ie`ie* vine and fill the house which was near by.

After doing this Ku`olokele then told Maui to go home but to return in three days. While Maui was gone Ku`olokele fashioned a bird out of the materials gathered by Maui. When Maui returned his grandfather bid him enter this "*mokumanu*" (bird ship) and gave him the following instructions. Maui must go to the land of Moanaliha which was Pea-pea's land. There he would find a village and the inhabitants would be down on the beach. Among them would be Pea-pea and Maui's wife.

Maui was to attract their attention and then fly away out over the ocean. As he returned towards the group Pea-pea would say, "Perhaps that is my bird and if so he will fly to and rest on the sacred box."

Maui listened to his instructions and then flew for two days and two nights until he reached the land of Moanaliha. He did as he was told and when Pea-pea exclaimed about the bird Maui flew to the sacred box and rested there. The chief then returned to the village and commanded the bird to be brought to his sleeping house and fed. This was done and then all retired. But Maui had to wait for Pea-pea's eyes to close one by one. Since it was almost dawn he called on Hina to hold back the night for a little while. This done Pea-pea's 8 eyes were finally all closed in sleep. Maui was then able to kill Pea-pea. He cut off Pea-pea's head and taking this and his wife flew back to his grandfather where they all feasted and rejoiced.

(Sterling & Summers 1978:65, citing T.G. Thrum, *More Hawaiian Folk Tales: Further Exploits of Maui*, pg 252).

Maui and Manaiakalani

(Synopsis) Mauikupua lived with his grandmother Hina. He often wondered why the islands were separated and decided to join them. He consulted his mother who sent him to ka`alaenuiahina (k). Ka`alae told him the power to do so belonged to Unihokahi who is found at Ponaha keane (a fishing station at `Aloha).

Maui returned home and next day told his mother he was going fishing. Maui asked his brothers to go with him and they made ready their fishing gear. Maui got ready his famous hook Manaiakalani. Maui told his brothers to watch for a *kaliu* (bailer) floating at the bow of the canoe and to catch it. They sailed to the middle of the sea of `Aloha and Maui took bearings from Hina's place of drying her *kapas*. There they saw the *kaliu* and Maui told his brother Maui-mua to catch it. His brother thinking there was no need for one did not do so, so Maui caught it as it floated by him. The name of this bailer is Hinaakeka.

When the brothers turned around they saw a beautiful woman in the back of the canoe. They all sailed on to Ponahakeone and anchored but when the brothers looked around again the woman was gone. Maui knew the bailer (the woman) had dropped into the sea. He called to his brothers to drop a hook to the bottom of the ocean, but each time they caught only a fish. Maui then dropped Manaiakalani and told his brothers to prepare to paddle. The hook was grasped by Hinaakeka who took it to Unihokahi. She asked him to open his mouth so she could see if he had one tooth or many. When he did so, she hooked in Manaiakalani and jerked the line so Maui would know.

Maui then commanded his brothers to paddle hard but not to look back. Finally becoming exhausted and thinking that it was not a fish they had hooked, they gave up and looked back. They saw the chain of islands following and were surprised. Maui was angry because they didn't reach the shore and the islands were never joined. The hook was loosened from Unihokahi's mouth and the islands separated and drifted back to their original positions.

(Sterling & Summers 1978:65-6, citing T.G. Thrum, *More Hawaiian Folk Tales: Further Exploits of Maui*, pg. 248).

The meaning of "Lualualei" is somewhat controversial, as there are two competing explanations. The first postulates that Lualualei literally means "flexible wreath:"

> . . . An allegory relating to the clever strategy of the famous Mailekukahi, a high chief of O`ahu, whose flexible flanks of warriors surrounded four invading armies from Hawai`i and Maui at the great battle of Kipapa where the corpses of the slain paved the bottom of this ravine, about A.D. 1410 (Sterling & Summers 1978:68).

The second definition of Lualualei is "beloved one spared." This is a reference to the

legend of Kalakua who was suspected of violating *kapu* by wearing the king's *malo* (loin cloth):

> . . . and it was told that the family, elders and children together, would be set on fire for the wrong committed by Kalakua. Though he alone was thought to have committed the misdeed, the whole family was held guilty. The company, somewhat in the nature of prisoners, spent the night at Lualualei near the fish pond on the plain. The next day they reached the southern side of Kanepuniu, and there they encamped for eight days to await an announcement concerning the death and burning of the wrongdoers. Finally, a proclamation from the king was given by Kula`inamoku, stating that there would be no deaths, for Kalakua had not worn the king's malo. Thus was the Luluka family spared a cruel fate. A child born in the family later was named Lualualei (The beloved one spared).(I`i 1959:23)

Accounts of early foreign observers give only a generalized picture of the late pre-contact/early historic patterns of population and activity within the Wai`anae District and Lualualei itself. Captain George Vancouver, sailing along the Wai`anae Coast in 1793, noted: "The face of the country did not...promise an abundant supply [of water]; the situation was exposed." He described the coast as "one barren rocky waste nearly destitute of verdure, cultivation or inhabitants" (in Krauss 1973:17).

The only village Vancouver observed was "at Wai`anae, located in a grove of coconut and other trees on the southern side of a small sandy bay" (*Ibid.*:17). It is probably this village that was visited in 1815 by John B. Whitman who described the eastern coast of O`ahu between Wai`anae and Honolulu:

> The eastern side of this Island presents but few subjects worthy of remark, rude and magnificent scenery will often land amid hills and vales and rocky promontories will serve to cheer the general gloom but [the visitor] will pant for the charming scenes of Hanoruru and Whyteetee.
>
> After proceeding for some time over an uncultivated plain, we arrived at small village situated on the sea shore. It consisted of about twenty huts occupied by fishermen (Holt 1979:82)

The "uncultivated plain" Whitman observed before reaching Wai`anae likely encompassed Nānākuli and Lualualei. Mary Kawena Pukui's description of the inhabitants at the coast of Nānākuli may characterize those in Lualualei as well:

> In the olden days, this place [Nānākuli] was sparsely inhabited because of the scarcity of water...The fishing was good but the planting very poor. When it rained, some sweet potatoes would be put into the ground, but the crops were always poor and miserable.

> There were a few brackish pools from which they obtained their drinking water and it was only when they went to the uplands of Wai`anae that they were able to get freshwater. They carried their water home in large calabashes hung on mamaka or carrying sticks and used their water very carefully after they got it home. They spent most of their time fishing and most of the fish they caught were dried as gifts for friends and relatives in the upland. Sometimes they carried dried and fresh fish to these people in the upland and in exchange received poi and other vegetable foods. And as often as not, it was the people of the upland who came with their products and went home with fish. (*Ibid.*:10)

While the pioneer Hawaiian historians and documenters Samuel Kamakau and John Papa I`i do report on Lualualei, they mention only *ahupua`a* mythologies and the presence of trails and a fishpond: no indication is given of any sizeable population within the region. I`i indicates that "there were three trails to Wai`anae, one by way of Puu o Kapolei, another by way of Pohakea [pass], and the third by way of Kolekole [pass]" (I`i 1959: 97). The trail from Kapolei followed the Wai`anae coastline around Kaena Point. All these trails were certainly of some antiquity. The one through Pohakea Pass possibly traversed a portion of the present study area along `Aloha Stream. (Hammatt et al. 1993:8). The coast of Lualualei, like Nānākuli, appears up to late prehistoric/early historic times to have sustained a sparse population which was limited to isolated habitations supported by marine resources. Environmental components including the dry climate (less than 20 inches of rainfall on the coast and 30 inches throughout the rest of the *ahupua`a* (Armstrong 1973:56)), and geologic limitations ("much of the seaward portion of the valley is uplifted coral limestone that in some areas is thinly disguised with a shallow layer of soil" (Kelly in Haun 1991:310)). These factors were likely determinative constraints upon population density along the Lualualei coast. Although these and various other historic accounts describe the coastal regions of Nānākuli and Lualualei as relatively uninhabited because of their limited subsistence resources, archaeological evidence suggests that late prehistoric and early historic land usage occurred inland of the coastline.

C. Mid to Late 19th Century

Whatever coastal population was present by the beginning of the nineteenth century would have been distinct from an agriculturally-based population component - "friends and relatives" - in the *mauka* reaches of Lualualei. Land Commission Award documents from the mid-nineteenth century give clues to where at least some of the *mauka*-ward population was clustered in late prehistoric/early historic times. Six *kuleana* awards were recorded for Lualualei, all in the *`ili* of Pūhāwai. Marion Kelly summarizes the six land claims:

> Information provided by farmers in their claims to the Register of the Land Commissioners to Quiet Land Titles revealed that at least eight families were living in Pūhāwai in 1848, and that they cultivated at least 163 *lo`i* (taro pondfields), in addition to dryland crops on the *kula* (plains), and *wauke* (*Broussonetia papyrifera*) in the small valleys. One claimant was even making salt...
> The average size of the land awarded to the six claimants was 9.237 acres. If the two largest awards are not included, the average size of the remaining four awards drops to only 3.05 acres...Grouped as they were along the stream

> in the one *`ili* of Pūhāwai, the assumption is that this was the best land in Lualualei for raising wetland taro, and that this activity was being pursued by the awardees. (Kelly in Haun 1991:321-323)

Although all of the claimants testify to having received their land during the third or fourth decades of the nineteenth century, the location of their claims (the *`ili* of Pūhāwai) likely represents a focal point of *mauka* settlement and subsistence agriculture within late prehistoric Lualualei.

In the early 1800s Wai`anae became involved in the sandalwood trade controlled by Kamehameha:

> When [Kamehameha] needed a quantity of the wood to pay for some purchase, he simply issued orders to have it cut and transported to the waterside. In 1817 the ship *Columbia* was purchased, to be paid for in sandalwood to the amount of `twice the full of the vessel.' The wood for this purchase was furnished by Kaumualii of Kauai and the chiefs who controlled the Waimea and Wai`anae districts of Oahu. (Kuykendall 1965: 88)

The intensive trade in the wood obliterated the sandalwood forest and upset the traditional Hawaiian culture. According to Samuel Kamakau:

> This rush of labor to the mountains [to cut sandalwood] brought about a scarcity of cultivated food throughout the whole group [of islands]. The people were forced to eat herbs and tree ferns, hence the famine called Hi-laulele, Haha-pilau, Laulele, Pualele, `Ama`u, or Hapu`u, from the wild plants resorted to. (Kamakau 1992: 204)

As a result of an accelerated oppression of the people following the death of Kamehameha in 1819 when control of the rich sandalwood trade was placed in the hands of local chiefs, the people of Wai`anae pulled out the sandalwood saplings to avoid future harvesting (*Ibid.*).

Domesticated animals including goats, sheep, and cattle were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were first brought to O`ahu. L.A. Henke (1929: 21), however, reports the existence of a longhorn cattle ranch in Wai`anae by at least 1840. During this same period, perhaps as early as 1790, exotic plant species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the dwindling sandalwood forest and erosional effects of animal

grazing. The following dates of specific vegetation introduced to Hawai`i are given by R. Smith and outlined by Frierson (1972:10-11):

1) "early," c. 1790
Prickly pear cactus, Opuntia tuna
Haole koa, leucaena glauca
Guava, Psidium guajava

2) 1835-1840
Burmuda [sic] grass Cynodon dactylon
Wire grass, Eleusine indica

3) Lantana, Lantana camara

The *kiawe* tree was also introduced during this period, either in 1828 or 1837 (Ibid.:11).

Following the western encroachment into the Wai`anae Coast, a swift decline in population occurred due to disease and a "tendency to move to the city where there was more excitement" (McGrath et al. 1973:25). In 1835, a missionary census listed 1,654 residents on the Wai`anae Coast. The population of the Wai`anae Coast was decimated by a small pox epidemic in late 1853. In 1855, the Wai`anae tax collector recorded 183 taxpayers on the leeward coast, which is thought to represent a total population of about 800 people. This catastrophic depopulation facilitated the passing of large tracts of land into the hands of few landholders and led to the decline of the traditional Hawaiian economy that once supported the region. (Hammatt et al. 1993:10-11).

Between 1850 and 1880, ranching was the leading industry of the Wai`anae Coast. During this time and prior to 1886 (year of King Kamehameha IV's death) large tracts of crown lands in the Wai`anae District were sold with fee simple titles or placed under long-term leases to various entrepreneurs and families such as Samuel Andrews in Makua Valley; the Dowsetts in Nānākuli, Lualualei, Mikilua, and later in Wai`anae; and the Holt clan in Makaha.

In 1878, Hermann A. Widemann - a retired Supreme Court Justice - began Wai`anae Plantation, the first sugar plantation on O`ahu. Roger Green reports that "between 1878 and 1884 the economy and community of Wai`anae underwent a major change, in which the former Hawaiian landscape virtually disappeared" (Green 1980:12). With the hiring of 20 local Hawaiians, 15 haole technicians and almost 60 Chinese laborers, Widemann essentially created a town at Wai`anae to support the cultivation and processing of sugarcane. This included the building of 24 new houses and a manager's residence along with a sugar mill and various extensive irrigation systems. In 1884, the Hawaiian Directory reported Wai`anae to be the largest settlement on the island outside of Honolulu. By 1890 the Wai`anae Sugar Plantation had over 600 acres in sugar cultivation, 12 miles of railroad and 350 laborers; the 1890 census reported 903 residents in the Wai`anae District.

On George Bower's trip around O`ahu in 1880, he described Lualualei Valley as "occupied as a grazing farm" by Dowsett and Galbraith who leased "sixteen thousand acres

from the Crown" (in Haun and Kelly 1984:32).

An 1884 government survey map of Wai`anae and adjacent lands shows no structures in the vicinity of the project area; however, the railroad and "main road to Honolulu" lie less than 500 m *makai* of the site (Figure 3). In addition, a "solitary cocoanut" is situated 400 m to the south which may suggest a habitation nearby (Jackson, 1884).

Following the overthrow of the Hawaiian monarchy in 1893, crown lands along with government lands became recognized as public domain and subsequently became available for homesteading. (*Ibid.*:12-13)

D. 20th Century

At the turn of the 20th century the *ahupua`a* of Lualualei was divided into numerous homestead lots. The largest homestead lot totaled 2,629 acres and was sold to H.M. von Holt in 1903 for ranching cattle (Haun and Kelly 1984:37-38). A 1902 Hawai`i Territory Survey shows the project area within a "Govt. Reserve" (Figure 4: Emerson and Harvey, 1902). By 1929 over 8,184 acres of the McCandless Cattle Ranch land, "the area which now constitutes the Lualualei branch" (in Haun and Kelly 1984:41) had been purchased by the U.S. military.

Specific to the project area, the study parcel and the area *mauka* of the project area were part of a quarry which mined coral for lime. A 1927-1930 War Department map shows the quarry and associated structures at the *mauka* end of a short section of OR&L track which was constructed for transportation of the lime products (Figure 5). Use of the track was discontinued when OR&L went out of business. The project area (which was part of a 301-acre acquisition) was acquired by Lenakona Development, Ltd., which is an offshoot of the former Hawaiian Gas Products, from the Wai`anae Lime Company in 1939. At the time of the purchase, a cement and lime plant was operating on the parcel of land. Following the land acquisition, Hawaiian Gas Products changed it's name to Gaspro and with American Cement Company formed Hawaiian Cement Company in 1950 with the Wai`anae parcel becoming a part of the enterprise. The quarry operation included a crusher, kiln, warehouse and housing, the majority of which has been demolished, with the land being converted to residential housing and the Wai`anae Sewage Treatment Plant. In 1976 the lime plant ceased operation on the Wai`anae property due to complaints of noise and dust. A corrugated steel warehouse and hopper are all that currently remain on the property associated with the lime operation (Lenakona Development: Background History of Wai`anae Property).

E. Modern Land Use

Within the last ten years, the existing warehouse was used by the Hawaiian Homeless Women and Children foundation as a drop off center for food and durable goods. Currently, the project area is on a vacated graded lot which contains the existing metal warehouse and hopper (not in use) and scattered trash from unknown sources.

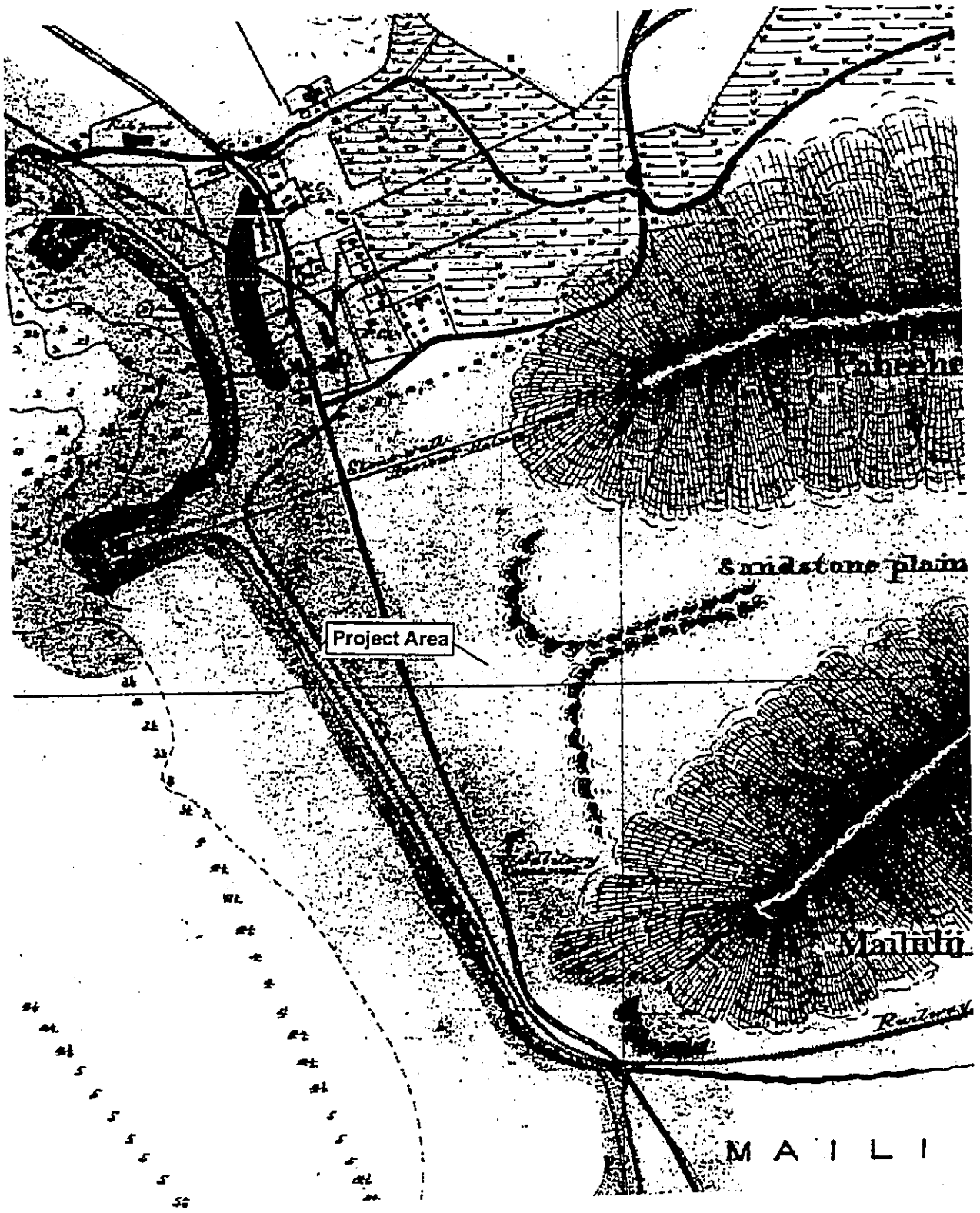


Figure 3 A Portion of the 1884 Hawaiian Government Survey Map Showing the Location of the Proposed Wai'anae Community Transit Center

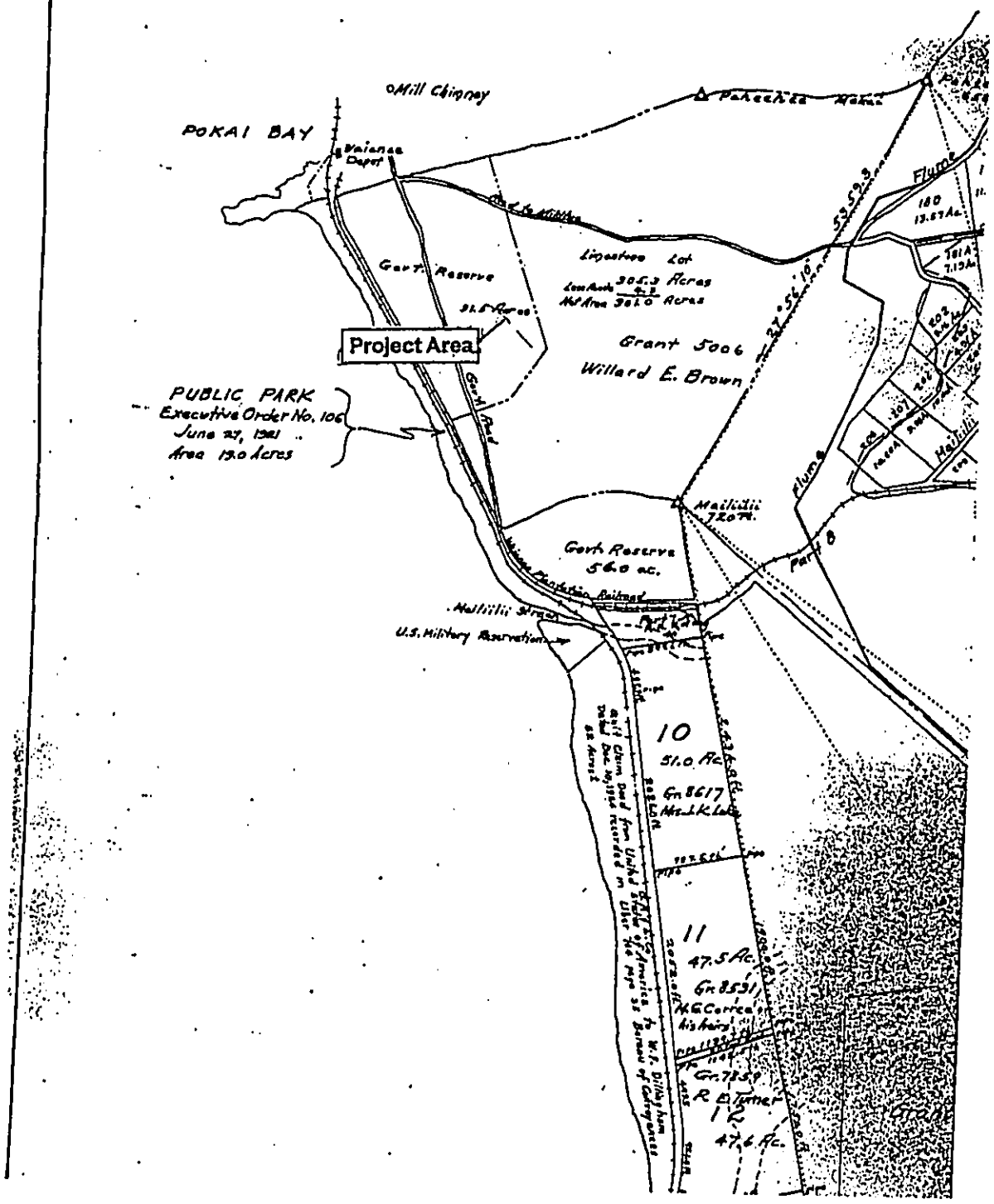


Figure 4 A Portion of the 1902 Hawaii Territory Survey Map of Lualualei Homestead Showing the Location of the Proposed Wai`anae Community Transit Center

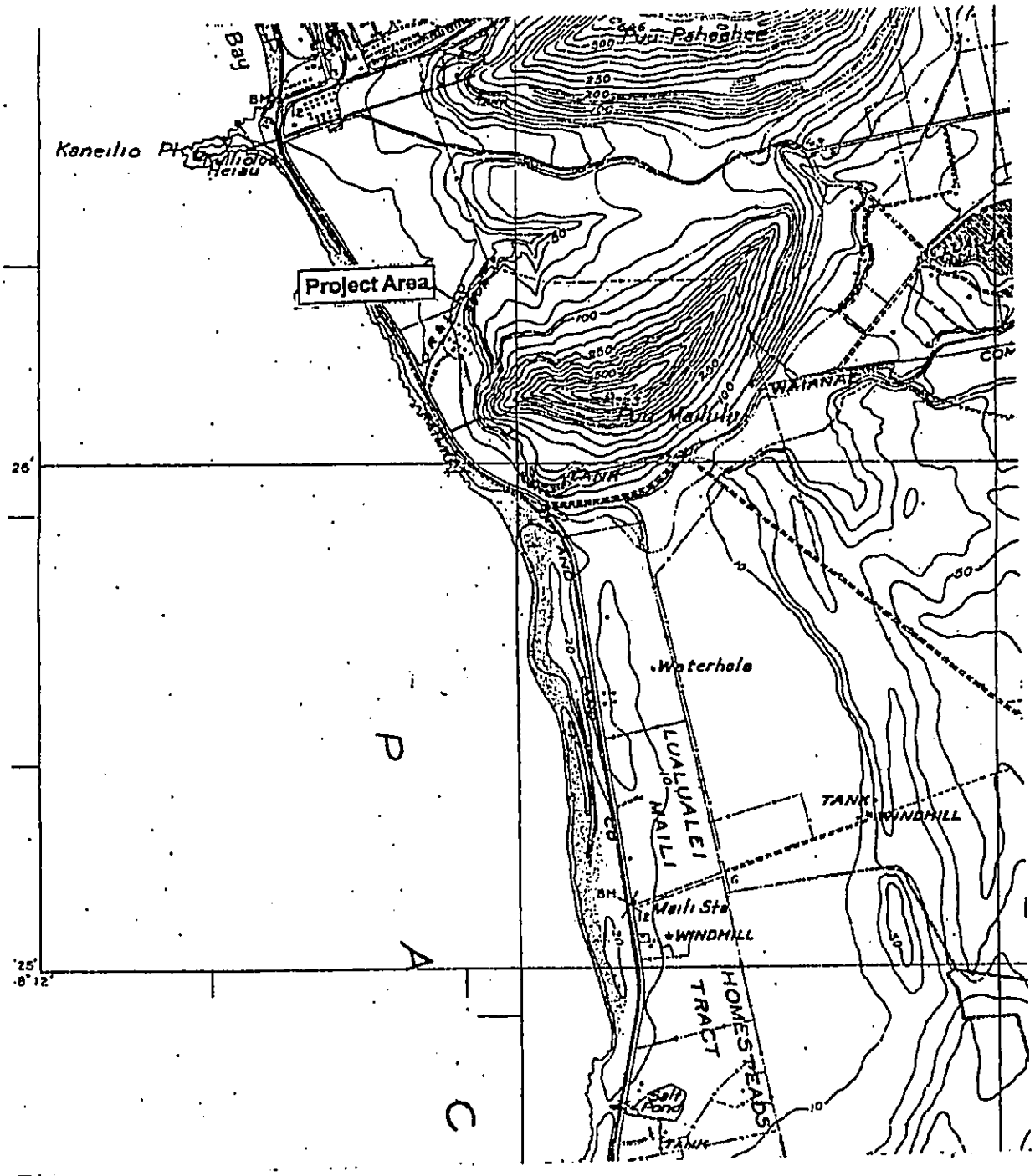


Figure 5 A Portion of the 1927-1930 War Department Map of Wai`anae Showing the Quarry Structures in the Current Project Area (note the OR&L track leading to the quarry)

III. PREVIOUS ARCHAEOLOGICAL STUDIES

The table below summarizes previous archaeological investigations in Lualualei *ahupua`a* Figure 6 shows the locations of previous archaeological studies in the vicinity of the project area.

Reference	Location	Description and Results
Barrera 1975	Ma`ili, Oahu Kaiser Pacific Properties Corp. Land	**Archaeological Site Survey:** Six sites were found; a religious structure; C-shaped feature; two housesite features; a possible site; and a midden scatter.
Cordy 1975	Mā`ili, O`ahu Kaiser Pacific Properties Corp. land	**Excavation of Site CH-0A-1:** The religious structure in Barrera's (1975) report was excavated. This report found no evidence to confirm the site as being a religious structure, instead it was found to be a modern structure built no earlier than 1930 or 1940.
Bordner 1977	Lualualei Ahupua`a TMK 8-7-9	**Reconnaissance Survey:** Preformed on the proposed site for the Nānākuli landfill. The area included land on both sides of Lualualei Naval Road, continuing up the slope to Pu`u Heleakala. No Archaeological sites were found.
Kennedy September 1983	Lualualei Ahupua`a TMK 8-7-06:32	**Reconnaissance Survey:** No archaeological sites were found on or within 50 feet of the proposed Wai`anae Corp. Yard site.
Hammatt, Shideler, and Douglas September 1991	Mā`ili, O`ahu Liopolo Street	**Archaeological Monitoring and Osteological Analysis:** Seven burials were discovered during the installation of a Board of Water Supply 8 inch watermain. The burials were found in calcareous beach sand. Five burials were removed and two were left *in situ.*
Haun October 1991	Lualualei Ahupua`a Navel Magazine and Navel Communicatio ns Area Transmission Facility TMK 8-6; 8-7; 8-8-01	**Archaeological Reconnaissance Survey:** Included a 8,184 acre parcel, and a 700 acre parcel both encompassing the entire inland portion of Lualualei Valley. A total of 131 sites were located and 1,004 features identified. These features included "alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces" (Haun 1991; vii). These are features that relate to "habitation, rituals, ceremonies, agriculture, the procurement of lithic raw material, and the manufacture of stone tools. Historical and recent structures associated with cattle ranching and military use... were also identified" (*Ibid*).

Chiogioji, Hammatt, June 1993	Lualualei Ahupua`a TMK 8-7-21:17	**Archaeological Survey and Testing:** (Revised from the 1992 'Archaeological Investigations' report) This five acre parcel, formerly a basil farm, was situated between Pu`u o Hulu to the northwest and `Aloha Stream to the southeast. The results of the survey found an absence of intact archaeological remains.
Hammatt, Robins, Stride, Revised November 1993	Lualualei Ahupua`a Lualualei Golf Course TMK 8-7-9:2; 8-7-10:6&10; 8-7-19:1	**Archaeological Inventory Survey:** Identified eight sites within the project area, two traditional Hawaiian sites that included one habitation complex and the remnants of one wall, and six historic sites that included a cattle wall, a furnace, wells, a house lot, and cement foundation structure. (These findings have also been included in the Final Environmental Impact Statement produced by Hida, Okamoto, & Associates, April 1991)
Jimenez, June 1994	Lualualei Ahupua`a TMK 8-7-10:2	**Additional Inventory Survey:** Conducted at four previously inventoried sites in the Ma`ili Kai project area. This inventory identified intact prehistoric and historic cultural deposits at two of the tested sites. Twenty-five of a previously known 26 sites had been considered significant for scientific information content and required no additional data collection, while the remaining site was considered significant and recommended for additional data collection.
Mayberry, Rosendahl March 1994	Lualualei Ahupua`a TMK 8-7-10:2, 14	**Reconnaissance Survey:** Twenty-six sites were located. Twenty-four of these sites dated to the 20th century. Two of the 24 sites dated to the early to late 20th century, and the other 22 sites dated from 1930 to the present. The remaining two sites presented rock features, possibly predating the 20th century.
Deveroux, Chiogioghi, and Hammatt December 1997	Wai`anae Ahupua`a TMK 8-5-04:01, 58, and 41	**Archaeological Reconnaissance Survey:** Two archaeological sites were located in the project area, a stone wall and a military bunker. A third site previously identified by McAllister could not be located.

Ogden Environmental and Energy Services Co., Inc. August 1997	Lualualei Ahupua`a Lualualei Navel Magazine (NAVMAG), Lualualei Headquarters Branch (NAVMAG-LLL), West Loch Branch (NAVMAG-West Loch), and Waikele Branch (NAVMAG-Waikele).	**Cultural Resource Review Survey:** This survey reviewed existing information on sites in the previously listed locations. Sites reviewed within NAVMAG-LLL included 197 sites with 1020 recorded features and also an additional 400 sites that had been reported but not recorded; in NAVMAG-Waikele five sites with 11 features; in NAVMAG-West Loch two sites; and Kolekole Rock was located near NAVMAG-LLL. Three sites listed in the National Register of Historic Places (NRHP) were located in the project area, they include the Nioiula Heiau, NAVMAG-LLL; Okiokiolepe Fishpond, NAVMAG-West Loch; and the Pearl Harbor National Historic Landmark, NRHP site 50-80-13-9992.
Ogden Environmental and Energy Services Co., Inc. July 1998	Lualualei Ahupua`a Radio Transmission Facility	**Phase I Archaeology Reconnaissance Survey:** This survey was conducted to locate archaeological sites and incorporate them into a Cultural Resource Management Plan. Three sites were located on a 260 acre parcel. Site 5591 is composed of features that are associated with the sugarcane industry of the 19th and 20th centuries. Sites 1886 and 5592 are considered traditional Hawaiian sites, they include a permanent habitation site and a rock mound.
McDermott and Hammatt May 2000	57.65-acre `Aloha Beach Park	Archaeological Inventory Survey: Site -50-80-12-9714, OR&L Railroad line; Three previously unrecorded sites : 50-80-12-5761 WWII military structures; -5762 and 5763 subsurface cultural layers
McDermott and Hammatt July 2000	Landscape Site Improvements to `Aloha Beach Park	Monitoring Plan: On-site monitoring recommended

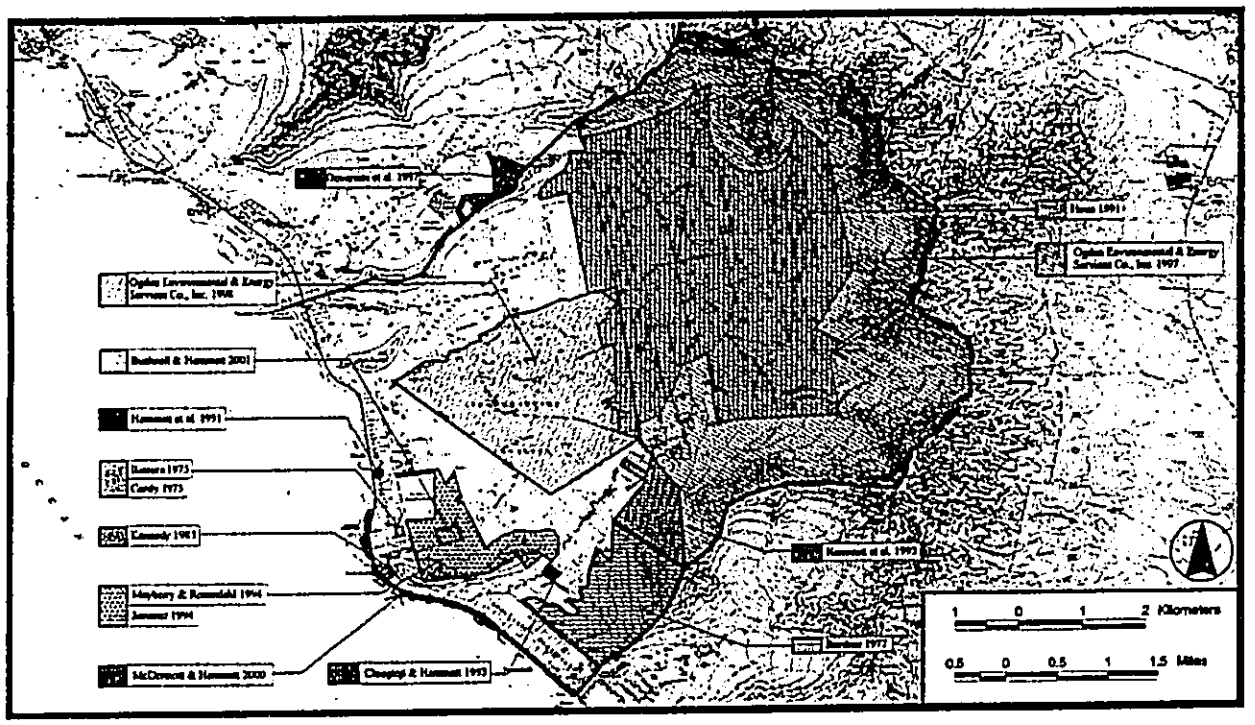


Figure 6 Map Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Area

The earliest attempt to record archaeological sites in the nearby regions of Lualualei was in the 1930s by J. Gilbert McAllister. Sites located closest to the present study area include a large rock referred to as "Maui" (McAllister 1933:110).

The large rock, referred to as "Maui," is located on the coast near `Aloha Stream. Oral tradition identifies this rock as the place where the demi-god Maui "reposed and sunned himself" after first arriving in the Hawaiian Islands from the south (McAllister 1933:110).

An archaeological reconnaissance survey specifically conducted in Lualualei Valley by Alan Haun (1985) recorded the presence of a significant number of traditional Hawaiian sites. The project included surveying of approximately 3,130 acres of Lualualei Valley. A total of 376 indigenous (Hawaiian) "features" were recorded, including a wide range of site types from cliff overhang shelters, caves, and habitation platforms to field terraces and mounds, in addition to religious and lithic technology sites; possible burials were also noted. Nine radiocarbon dates obtained from the survey indicate an interior settlement pattern by the 1400s when, according to Haun, "mid-level elevation sites were occupied." Haun further suggests that the majority of the remaining "features" were occupied by the mid-1600s, probably permanently until the 1800s (*Ibid.*:13). Haun also indicated, however that many prehistoric and early historic structures had been demolished, and their stones reused for cattle ranching needs. (Mayberry & Rosendahl 1994:4).

Archaeological studies conducted within Lualualei during recent decades have further clarified the *ahupua`a* settlement pattern. The most extensive archaeological research project within the *ahupua`a* of Lualualei was a reconnaissance survey of the "Naval Magazine, Lualualei (NAVMAG LLL) and Naval Communications Area Master Station Eastern Pacific Radio Transmitting Facility, Lualualei (RTF LLL)" accomplished by the Public Archaeology Section of the Bishop Museum during the mid-1980s. The two facilities comprise more than 9000 acres. According to the survey report prepared by Alan E. Haun, within this area twenty parcels

> totaling 3,130 acres were surveyed for cultural resources at three levels of intensity. . . The research area includes the entire inland half of the large amphitheater-shaped valley, and approximately one-third of the coastal half. (Haun 1991: 4)

Haun's report summarizes the survey's findings:

> A total of 131 sites consisting of 1,004 features was identified during the survey. Indigenous Hawaiian feature types recorded include alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces. The features recorded relate to activities including habitation, rituals, ceremonies, agriculture, the procurement of lithic raw material, and the manufacture of stone tools. Historical and recent structures associated with cattle ranching and military use of the area were also identified.

Fourteen shovel probes provided datable materials (charcoal and volcanic glass), as well as cultural materials (artifacts and midden). Radiocarbon dates range from A.D. 1420 to 1950.

> It is suggested that the interior of Lualualei Valley was initially occupied on a temporary basis by people cultivating the area. This may have begun as early as the mid 1400's, continuing up to the mid to late 1700's to early 1800's, permanent habitation sites were occupied and population of the valley evidently increased quite rapidly, based on the dense distribution of habitation and agricultural features. (*Ibid.*: vii)

The report notes that the "survey areas at Lualualei are some of the largest continuous and relatively undisturbed land parcels in leeward O`ahu" (*Ibid.*: 239), accounting for the profusion of well-preserved archaeological features encountered. In any case, since most areas of Lualualei get less than 30 inches of rain annually, the inland half of the *ahupua`a* - with its more abundant rainfall - likely constituted the optimum zone for the diverse habitation and agricultural activities evidenced by these sites and features. Thus the findings of the Bishop Museum survey may not be directly applicable to the present parcel which lies in the relatively dry, coastal zone of Lualualei.

Another archaeological inventory survey of an approximately 170-acre parcel located southeast of the Naval Magazine was conducted by Cultural Surveys Hawaii, Inc. in November of 1990 (Hammatt *et al.* 1991). The parcel is described as comprising "vacant, unused lands. It is undeveloped and contains several remnant and abandoned historic *structures*" (Hammatt *et al. 1991*:7). Eight archaeological sites were identified, including "two traditional Hawaiian sites and six historic sites related to ranching and military activities" (*Ibid.*:i). The two traditional Hawaiian sites - 50-80-08-4366 (a site complex) and 50-80-08-4367 (a wall remnant) - were interpreted as being attributable to traditional Hawaiian activity, with one site (50-80-08-4366) probably representing prehistoric, recurrent habitation at the foothills of Pu`u Heleakala. This is primarily evidenced by the presence of a probable hearth feature within the site complex. Site 50-80-08-4367 - a remnant wall section running adjacent to an intermittent stream bed - suggests an agricultural usage possibly constructed to retain or divert water. Given the weathered condition of the structure this site may be prehistoric (Hammatt et al. 1991).

The paucity of Hawaiian sites within the study parcel - in comparison to the number located within the large Naval Magazine study area located to the north and *mauka* suggests that the parcel may represent, at most, the *makai*-most fringe of the upland settlement. The survey report concludes:

> The few traditional Hawaiian sites identified during the present study suggest that most of the project area was sparsely inhabited during prehistory and early history. This would be due primarily to the lack of fresh water resources in the vicinity. . .Although surface run-off and intermittent drainages present in the project area would allow some potential for seasonal agriculture, the attraction for settling in the wetter upland valleys would surely have been greater (Hammatt et al. 1991:31).

During the 1970s and '80s, a series of studies was undertaken in Lualualei at Mā`ili on the Wai`anae (northern) side of Pu`u o Hulu. The area encompassed by these studies - which would ultimately comprise 415 acres. In 1975 William Barrera conducted an "archaeological site survey of approximately 80 acres at Mā`ili." Barrera recorded six sites:

five stone configurations and a single midden scatter. Four of the stone structures were deemed by Barrera to be either of modern origin or too amorphous to assess. However, one site, Ch-Oa-1, was judged "quite probably an ancient religious structure" (Barrera 1975:9). In October of 1975, Ross Cordy performed an archaeological excavation of Site Ch-Oa-1. Cordy's report on the excavation noted "no underlying cultural deposits were found" and Cordy concluded: "The results of the excavation indicate the structure was not an ancient religious structure, rather a quite recent structure (probably built no earlier than 1930-1940) of unknown function" (Cordy 1975).

Also in 1975, Cordy conducted an archaeological survey of an additional 130 acres at Mā`ili. Cordy identified nineteen sites and noted: "Most of the sites found in this survey are either walls [deemed by Cordy to post-date 1890], highly disturbed sites, or seemingly recent (ca AD 1890-1970) sites" (Cordy 1976: 21).

The areas surveyed by Barrera and Cordy in the 1970s were subsumed in a 415-acre "Mā`ili Kai Property project area" (TMK 8-7-10: 2,14) which was the subject of an archaeological reconnaissance survey conducted by Paul H. Rosendahl Inc. in December of 1987. The survey report (Mayberry and Rosendahl 1988) noted that "large-scale ranching, land clearing, and quarrying - from 1851 to the present - have extensively altered" the project area (Mayberry and Rosendahl 1988: ii) and documented 12 new sites and the reinvestigation of 14 sites previously recorded by Barrera and Cordy. The report summarizes:

> Land clearing and quarrying in particular have been destructive to the natural and cultural environments. One result of the destruction is that 24 of the 26 sites in the project area date to the 20th century. Two of the 24 sites date to the early to late 20th century and the other 22 sites date from 1930 to the present. Only two small sites, rock features without associated artifacts, may predate the 20th century (Mayberry and Rosendahl 1988: ii).

Robins and Anderson (1998) conducted a Phase I archaeological reconnaissance survey of 260-acres for the Lualualei radio transmission facility approximately 1 km southeast of the present project area. The survey identified three sites including a complex of 19th and 20th century sugarcane industry features (Site 5591), a traditional Hawaiian permanent habitation site (Site 1886), and a traditional Hawaiian rock mound (Site 5592).

McDermott and Hammatt (2000) conducted and archaeological inventory survey with subsurface testing of a 57.65-acre parcel for `Aloha Beach Park approximately 5 km south of the current project area. Four sites were identified including the previously documented OR&L Railroad line (Site -50-80-12-9714), and three previously unrecorded sites: 50-80-12-5761 WWII military structures; -5762 and 5763 subsurface cultural layers.

IV. FIELD INSPECTION

A field inspection of the 2.5 acre project area was conducted in April 2002 by CSH archaeologist David Shideler. Figure 7 shows an aerial photograph of the project area in it's current condition.

As noted above the parcel has been previously utilized in modern times and had undergone extensive grading, grubbing and quarrying in the previous 50+ years (Figure 8). The project area is currently enclosed by a chainlink fence which surrounds a fairly open tract of land. Within the enclosed parcel are several push piles of historic trash as well as an abandoned warehouse and attached hopper (Figure 9). The warehouse was originally constructed by the Wai`anae Lime Company in ca. 1930 and was enlarged by the Hawaiian Cement Company in the 1960's. Prior to the closure of Hawaiian Cement Company's Wai`anae operation in 1976, the warehouse was used as storage for the bagged lime product. The attached hopper was used to store the hydrated lime which was bagged and stored in the warehouse until sold. The OR&L shortline which extended up to the warehouse is no longer in existence.

The vegetation in the project area includes *kiawe*, banyan, octopus tree and *uhaloa*. The ground surface appeared completely graded and grubbed with some exposed coral outcrop. No traditional Hawaiian features were encountered within the parcel.

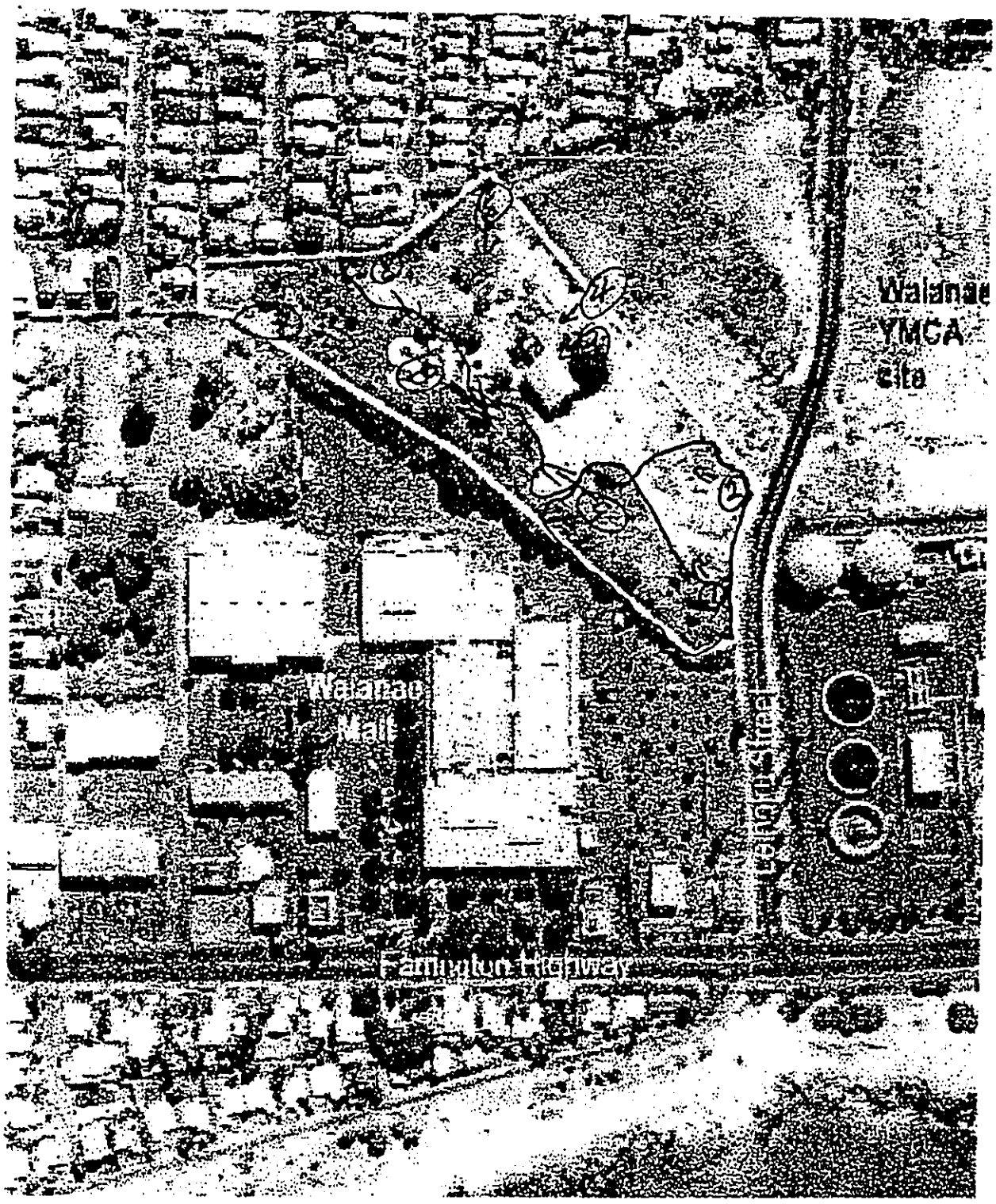


Figure 7 Aerial Photograph of Project Area Showing it's Current Condition

Figure 8 View Northeast of Project Area Showing the Graded Parcel and Existing

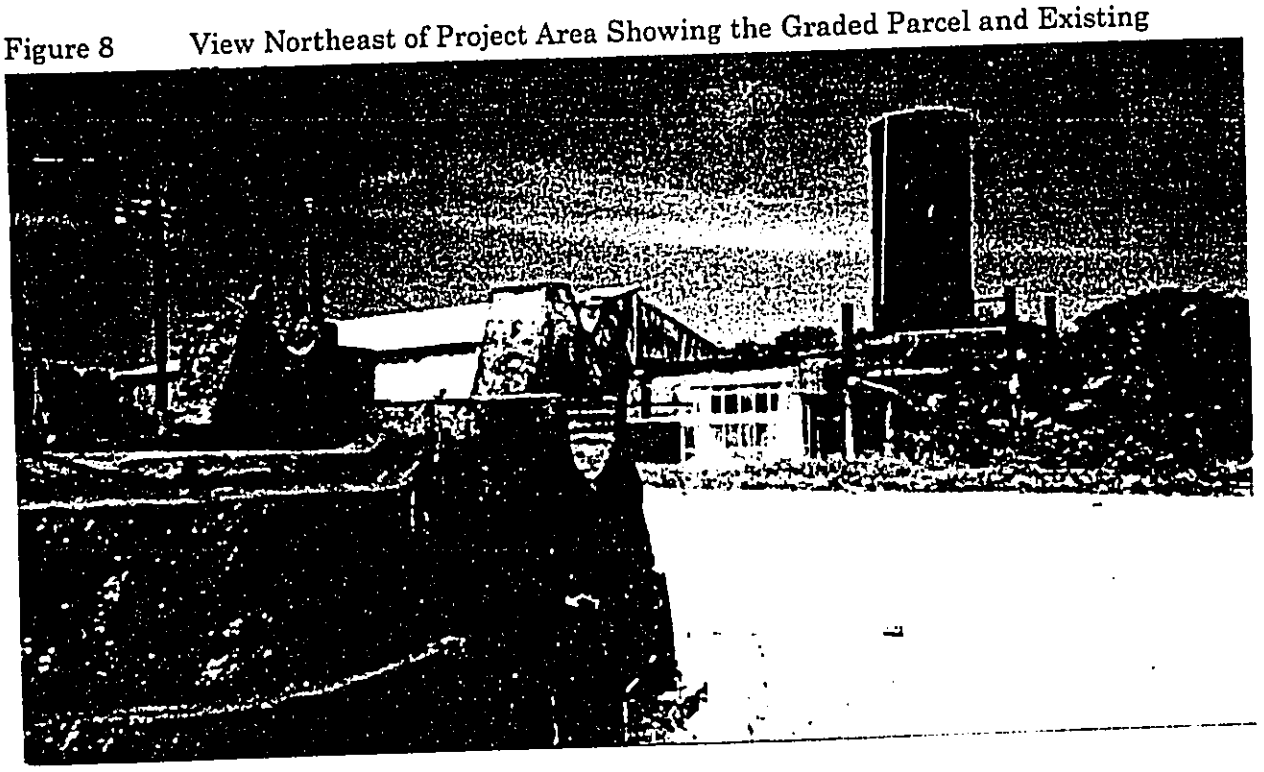


Figure 9 View Southwest of Existing Warehouse, Hopper and Heavy Machinery Bucket

V. NATIVE HAWAIIAN CUSTOMS PERTAINING TO THE PROJECT AREA AND POSSIBLE CULTURAL IMPACTS

A. Burials

There are no documented prehistoric or historic burials within or in the vicinity of the project area. As has been noted above, the project area is a portion of a commercial coral-mining (for lime) quarry that was in operation throughout much of the 20th century. The area geology within the project area makes it unlikely that the area once served as a traditional Hawaiian burial place.

B. Hawaiian Trails

There is no direct evidence or documentation that any traditional Hawaiian trails formerly coursed through the present project area.

C. Native Hunting Practices

There is no direct evidence or documentation of any native hunting practices specifically associated with the present project area.

D. Native Gathering Practices for Plant Resources

The extensive grading and grubbing associated with the operations of the commercial coral-mining quarry have long removed all traces of the original, pre-20th century vegetation in the project area. No evidence of any former gathering of plant resources within the specific project area remains. Additionally, there is no evidence of any on-going gathering practices.

E. Cultural Sites

The decades-long quarrying activities within the present project area have so disturbed and altered the original landscape that no surface cultural sites or properties are present.

VI. SUMMARY AND CONCLUSION

Historical background research including mythological accounts, LCA documentation, and previous archaeological research suggests that Lualualei *Ahupua`a* was initially occupied by the 15th century with settlement continuing likely until the early 19th century. Within the project area, however, extensive quarrying activities in the past 70 years have significantly altered the original landscape, removing any traditional Hawaiian sites which may have existed.

No previous archaeological studies have been undertaken within one kilometer of the project area. The closest research recorded three sites located on the 260 acre parcel. Site 5591 is composed of features that are associated with the sugarcane industry of the 19th and 20th centuries. Sites 1886 and 5592 are considered traditional Hawaiian sites, they include a permanent habitation site and a rock mound (Robins and Anderson, 1998). The OR&L railroad, which paralleled the coast and transferred much of the raw materials quarried from the Wai`anae Lime Company and later the Hawaiian Cement Company. No remnants of the OR&L spur were observed during the field investigation. One corrugated steel structure remains on the study parcel though this structure had been significantly altered (enlarged) in the 1960's by the Hawaiian Cement Company. This structure is not believed to lie in the area designated for the community transit center. One historic artifact consisting of a large loader bucket, presumably associated with quarrying activities, is currently situated within the project area.

The proposed Wai`anae Community Transit Center lies in an area which has undergone extensive land altering activities with the current land surface appearing to have been extensively mined and grubbed over the previous century, rendering it relatively free of surface and subsurface archaeological resources.

The area's history of commercial lime quarrying and associated activities has distorted or terminated native cultural practices, if any, that formerly pertained to the project area parcel. There is no evidence of any cultural practices – including burials, trails, hunting, gathering, and cultural sites – formerly associated specifically with the parcel, nor is there evidence of any ongoing cultural practices.

Based on the above findings, this study concludes that there will be no adverse impact to historical or cultural resources by the implementation of the transit center project.

VII. REFERENCES

Ahlo, Hamilton M., Jr.
1980 *Cultural Resource Reconnaissance of the Proposed Wai`anae Agricultural Park, Wai`anae, O`ahu,* Hawaii Marine Resource, Inc.

Apple, Russell A.
1978 *Pahukanilua: Homestead of John Young, Kawaihae, Kohala, Island of Hawai`i.* National Park Service, Hawaii State Office: Honolulu.

Armstrong, R. Warick
1983 *Atlas of Hawaii.* 2nd ed. University of Hawaii Press, Honolulu.

Barratt, Glynn
1988 *The Russian View of Honolulu, 1809-26.* Ottawa: Carleton University Press.

Barrera, William M., Jr.
1982 *Letter to Mr. Fred Proby, VTN Pacific* , Chiniago Inc., Kamuela, HI. On file State Historic Preservation Division

Bingham, Hiram
1847 *A Residence of Twenty-One Years in the Sandwich Islands.* Hartford: Hezekiah Huntington.

Bordner, Richard M.
1980 *Archaeological Reconnaissance –Wai`anae Water Main Replacement* Ms. on File State Historic Preservation Division

Borthwick, Douglas F. and Hallett H. Hammatt
1997 *Inadvertent Discoveries of Human Skeletal Remains, Church of Jesus Christ of Latter Day Saints (LDS), Pu`u Kahea, Wai`anae, O`ahu Island Hawai`i, (TMK 8-5-03:25)* Cultural Surveys Hawaii, Kailua, HI.

Chapman, Peter
1967 *Waianae Kai Pounder Workshop Area.* Ms. on file, Anthropology Department, B.P. Bishop Museum Honolulu

Ching, Francis
1978 *Examination of Approximately 10 acres at the Mauka end of Camp Ka`ala for Archaeological Sites, Wai`anae Valley, O`ahu,* A.R.C.H. Inc., Lawai, Kauai, HI.

Condé, Jesse and Gerald M. Best
1973 *Sugar Trains: Narrow Gauge Rails of Hawaii.* Glenwood Publishers: Felton, Calif.

Corney,Peter
1896 *Voyages in the Northern Pacific.* Honolulu: Thos. G. Thrum.

Denham, Tim, Joseph Kennedy, and Laura Reintsema
1992 *Archaeological Inventory Survey With Subsurface Testing Report For A Property Located at TMK: 8-5-02-48, Wai`anae Ahupua`a, Wai`anae District, Island of O`ahu*

Douglas, Michele T. Douglas
1991 *Report on a Child's Skeleton Recovered from the Beach at Makaha Surfside Apartments*, SHPO, Honolulu, HI.

Douglas, Michele Toomay and Michael Pietrusewsky
1988 *Human Remains at Makaha Beach, Makaha, O`ahu, TMK 8-5-17:08, Site 80-07-4064*, Police Report, Medical Examiner's Report and Physical Anthropologist's Report, UH-Manoa, Honolulu, HI.

Emerson, J.S. and F.E. Harvey
1902 Lualualei Homestead, Waianae, Oahu, Hawaii Territory Survey, Walter E. Wall, Surveyor, Scale 1:1000, Traced from RM 2165, H.E. Newton, 1905, Homestead Map No. 41

Environment Impact Study Corporation
1982 *Lower Wai`anae Well # 1 Walk-Through Archaeological Reconnaissance* Ms. on file State Historic Preservation Division

Flood, Krista, Paul Christiaan Klieger, Susan A. Libo, Boyd Dixon, Stephan D. Clark and Scot Parry
1994 *An Archaeological Inventory Survey and Mitigation Plan of a Seven Acre Parcel (TMK: 8-5-28:Por. 42) in Wai`anae Kai Ahupua`a Wai`anae District, O`ahu Island, Hawai`i*, Anthropology Department, Bishop Museum, Honolulu HI.

Gast, Ross and Agnes C. Conrad (ed.)
1973 *Don Francisco de Paula Marin.* Honolulu: Hawaiian Historical Society.

Green, Roger C.
1980 *Mākaha Before 1880 A.D.* Pacific Anthropological Records No. 31, Department of Anthropology. Bernice P. Bishop Museum: Honolulu.

Hammatt, Hallett H.
1985 *Archaeological Excavations at the Mauka End of Camp Ka`ala for Archaeological Sites, Wai`anae, O`ahu.* Cultural Surveys Hawaii

Hammatt, Hallett H., Douglas F. Borthwick and Rodney Chiogioji
1990 *Surface Archaeological Survey for the Proposed Pōka`i Bay Beach Park, Pōka`i Bay, Wai`anae, O`ahu.* Cultural Surveys Hawaii, Kailua, HI.

Hammatt, Hallett H., Douglas F. Borthwick and David Shideler
1987 *Archaeological Survey and Excavation of a Prehistoric Agricultural Complex (80-07-3200) Wai`anae Valley Agricultural Park, O`ahu.* Cultural Surveys Hawaii.

Hammatt, Hallett H., Douglas Borthwick, and David Shideler
1985 *Archaeogical Excavations at the Wai`anae Army Recreation Center, Poka`i Bay, Wai`anae, O`ahu, Hawaii.* Cultural Surveys Hawaii.

Hommon, Robert J.
1978 *Wai`anae (Kamaile Complex), O`ahu 80-07-1181 and Ho`ohana Project.* Ms. State Historic Preservation Division

Jackson, George and Gresley
1884 Waianae and Adjacent Coast, Oahu, April 1884, Scale 1:12000, R.M. 1348

Kamakau, Samuel M.
1992 *Ruling Chiefs of Hawaii.* Honolulu: Kamehameha Schools Press.

Kawachi, Carol T.
1992 *Burial Exposed by Hurricane Iniki, Waianae Regional Park, Waianae, Oahu, TMK 8-5-02:11,* Memorandum to files, SHPD, Honolulu, HI.

Kawachi, Carol T.
1990 *Mauna Lahilahi Crevice Burials, Makaha, Wai`anae, O`ahu,* SHPD, Honolulu, HI.

Kawachi, Carol T.
1979 *Makaha Surfside Burial: Artifacts, Kamaile, Wai`anae O`ahu, TMK 8-5-17:005, State Site No. 80-07-4064* SHPD, Honolulu, HI.

Kennedy, Joseph
1986 *Archaeological Investigations at Mauna Lahilahi, Wai`anae, Island of O`ahu.* Archaeological Consultants of Hawaii, Inc.

King, Pauline (ed.)
1989 *Journal of Stephen Reynolds, Vol I:1823-1829.* Honolulu: Ku Pa`a Inc.

Kirch, Patrick and Marshall Sahlins
1992 *Anahulu: The Anthropology of History in the Kingdom of Hawaii*, Vol. I. Chicago: University of Chicago Press.

Kolb, Michael J., Patty Jo Conte, Michael McFadden, Christi A. Mitchell, Ross Cordy
1995 *Archaeological Survey and excavations at Pahe`ehe`e Ridge, Waianae Ahupua'a, Waianae, Oahu,* Historic Preservation Division, Department of Land and Natural Resourses, State of Hawaii.

Komori, Eric
1987 *Archaeological Survey and Testing at Mauna Lahilahi, Wai`anae District, Island of O`ahu* Dept. of Anthropology, Bishop Museum, Honolulu, HI.

Kuykendall, Ralph
1965 *The Hawaiian Kingdom*, vol I. Honolulu: The University Press of Hawaii.

Kuykendall, Ralph
1953 *The Hawaiian Kingdom*, vol II. Honolulu: The University Press of Hawaii.

Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson
1983(1970) *Volcanoes in the Sea the Geology of Hawaii.* University of Hawaii Press, Honolulu

Masse, W. Bruce
1989 *A Preliminary Reconnaissance of the Proposed Route for the Wai`anae Valley Gravity Sewer.* Ms. of File Department of Hawaiian Home Lands

McAllister, J. Gilbert
1933 *Archaeology of Oahu*, Bulletin 104, Bernice P. Bishop Museum, Honolulu.

McGrath, Edward J., Kenneth M. Brewer and Bob Krauss
1973 *Historic Waianae: A Place of Kings.* Honolulu: Island Heritage Limited.

Neller, Earl
1982 *An Archaeological Reconnaissance Survey in a Portion of Wai`anae Kai, O`ahu* State Historic Preservation Division

Ota, Jason
1981 *Archaeological Field Report: Waianae Water Well Site for the Honolulu Board of Water Supply, Waianae, Oahu,* Historic Sites Office, Honolulu, HI.

Pukui, Mary K.
1983 *`Olelo No`eau: Hawaiian Proverbs and Poetical Sayings.* Honolulu: Bishop Museum Press.

Riford, Mary F.
1984 *Report of Archaeological Consulting Services During Repair of Sewer Lines and Replacement of Water Main Lines at Waianae Army Recreation Center, O`ahu, Hawaii.* Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Rosendahl, Paul H.
1981 *Archaeological Reconnaissance Survey of the Wai`anae Valley Road Improvements Alignment, Wai`anae, O`ahu,* PHRI, Hilo, HI.

Schilz, Allan J.
1994 *Subsurface Archaeological Intensive Survey and Data Recovery and Construction Monitoring and Sampling at Waianae Army Recreation Center (WARC), Wai`anae, O`ahu Island, Hawai`i.* Ogden Environmental and Energy Services Co., Inc.

Schmitt, Robert C.
1973 *The Missionary Censuses of Hawaii.* Bishop Museum: Honolulu.

Schmitt, Robert C.
1977 *Historical Statistics of Hawaii.* University Press of Hawaii: Honolulu.

Shapiro, William and Paul H. Rosendahl
1988 *Archaeological Reconnaissance Survey and Limited Subsurface Testing Waianae Kai Property.* Paul H. Rosendahl, Inc.

Sinoto, Akihiko
1979 *Archaeological Reconnaissance Survey of Proposed Water Well, Waianae, Oahu, Hawaii,* Ms. on file Bishop Museum, Honolulu, Hi.

Sinoto, Ahihiko
1978 *Reassessment of 10 Acres in Wai`anae Valley, Island of O`ahu,* Ms. on File Bishop Museum, Honolulu, HI.

Sinoto, Akihiko
1975a *Archaeological Reconnaissance Survey of the Wai`anae Light-draft Harbor Project Site, Wai`anae O`ahu* Ms. on file Bishop Museum Honolulu

Sinoto, Akihiko
1975b *Field Inspection of Site 50-Oa-C3-22; An Enclosure in Wai`anae Valley, O`ahu* Ms. on file Bishop Museum Honolulu

Social Research Systems Co-op
1989 *Preliminary Archaeological Monitoring Reconnaissance of Wai`anae Wells I and II, Construction Phase I* State Historic Preservation Division.

Social Research Systems Co-op
1988 *Wai`anae Wells I and II: Initial Cultural Resources Reconnaissance, Wai`anae, O`ahu* State Historic Preservation Division.

Sterling, Elspeth P. and Catherine C. Summers (comp.)
1978 *Sites of O`ahu*, Dept. of Anthropology, B.P. Bishop Museum, Honolulu, Hi.

Thrum, Thomas G.
1906 "Heiaus and Heaiau Sites Throughout the Hawaiian Islands,", *The Hawaiian Annual, 1907*, Honolulu, HI.

Yent, Martha & Agnes Griffin
1979 *Archaeological Reconnaissance Survey of Water Well and Access Road Project in Waianae Valley, Oahu*, State Parks, Department of Land and Natural Resources, Honolulu, HI.

APPENDIX B

Traffic Impact Analysis and Environmental Analysis

Prepared by Parsons Transportation Group, Inc., June 2002

Oahu Transit Centers

Traffic Impact Analysis and
Environmental Analysis

Prepared for

City and County of Honolulu
Department of Transportation Services
AM Partners, Inc.

June 2002

Prepared by

PARSONS

Table of Contents

1

Introduction

The project addressed in this report consists of the construction of three transit centers on the Island of Oahu. The transit centers will be constructed as part of the implementation of the City and County of Honolulu's new Hub and Spoke Bus Transit System, which will serve communities outside of Honolulu's primary urban center. The first three communities to be served by these projects are Waianae, Wahiawa and Mililani. The new Hub and Spoke System, when operational, will provide multi-route, interconnecting transfer locations for Honolulu's Public Transit System and will be a key element in the transportation infrastructure for the three communities. The transit centers will provide significant benefits toward increasing the operational efficiency of the system and enhancing the mobility of its users.

Waianae Site and Study Area

The Waianae Coast Community Transit Center site is located at 86–052 Leihoku Street and is immediately east of Farrington Highway/SR-93, adjacent to the Waianae Mall. The approximately 7.69-acre site is partially occupied by a warehouse structure, but is predominantly vacant land. The parcel is currently zoned I–2 (intensive industrial district).

The transit center will provide six to eight bus bays for city-operated buses with adjacent passenger waiting shelters, an additional two to three bus bays for privately operated school buses, a comfort station, a vending kiosk, an information kiosk, and parking for approximately 100 vehicles. The transit facilities will occupy approximately 2.5 to 3.0 acres of the parcel, with the balance of the land potentially supporting future development.

This analysis addresses the traffic impacts on the roadway network and key intersections adjacent to the project site. The study area for the Waianae Coast Community Transit Center consists of the following intersection(s):

- Farrington Highway at Leihoku Street.

Existing Roadways and Key Intersections

The following is a summary of the existing roadway network and key intersections within the project study area.

Farrington Highway/SR-93

Farrington Highway is a four-lane state highway with a right-of-way of approximately 55 feet within the vicinity of the project site. The posted speed limit on Farrington Highway is 35 mph.

Leihoku Street

Leihoku Street is a two-lane roadway in the vicinity of the project site with an approximate right-of-way of 41 feet. The posted speed limit on Leihoku Street is 25 mph.

Farrington Highway at Leihoku Street

Farrington Highway and Leihoku Street form a signalized "T" intersection. The northbound Farrington Highway approach has one through and one shared through/right-turn lane. The southbound approach has one left and two through lanes. The westbound Leihoku Street approach has one left-turn lane and a shared left/right-turn lane. Left turns from and onto Farrington Highway are not protected.

Wahiawa Site and Study Area

The proposed Wahiawa Community Transit Center site, located at 956 California Avenue, is on state-owned property and is currently utilized for parking, providing approximately 45 total spaces. The project site is bounded

by California Avenue to the south, Center Street to the north, Lehua Street to the west and North Cane Street to the east. The parcel is zoned R-5 Residential.

The proposed transit center will provide eight bus bays with adjacent passenger waiting shelters, a comfort station, information kiosks and electronic displays.

As with the Waianae project site, this analysis addresses the traffic impacts on the roadway network and key intersections adjacent to the Wahiawa project site. The study area for the Wahiawa Community Transit Center consists of the following intersections:

- California Avenue at Lehua Street
- California Avenue at North Cane Street

Existing Roadways and Key Intersections

The following is a summary of the existing roadway network and key intersections within the project study area.

California Avenue

California Avenue is a four-lane roadway in the vicinity of the project site with an approximate right-of-way of 66 feet. California Avenue is fully improved with curb and gutter on both sides of the street. The posted speed limit is 25 mph.

North Cane Street

North Cane Street is a two-lane roadway adjacent to the project site that dead ends approximately two blocks away. It has an approximate right-of-way of 80 feet and a posted speed limit of 25 mph.

Lehua Street

Lehua Street is a two-lane roadway parallel to the project site on the west. The approximate right-of-way is 70 feet, with a posted speed limit of 25 mph.

Center Street

Center Street is a two-lane roadway that parallels California Avenue to the north. Center Street has parallel parking on both sides of the street and is fully improved with curb and gutter. The approximate right-of-way is 79 feet.

California Avenue at Lehua Street

California Avenue and Lehua Street form a four-leg intersection with signal control. The eastbound California Avenue approach has one shared left-turn/through lane and one shared right-turn/through lane. The westbound California Avenue approach also has one shared left-turn/through lane and one shared right-turn/through lane. The southbound Lehua Street approach has one shared left-turn/through lane and one right-turn lane at the intersection with California Avenue. The northbound Lehua Street approach has one all-movement lane. The actuated signal provides for permitted left turns on all four approaches.

California Avenue at North Cane Street

California Avenue and North Cane Street form a signalized "T" intersection with actuated control. The eastbound California Avenue approach is striped as a single left-turn and two through lanes. The westbound California Avenue approach is striped as a single through and a shared through/right-turn lane. The southbound North Cane Street approach has a single shared left-turn and right-turn lane at California Avenue. Again, left turn movements occur on permitted phases.

Mililani Site and Study Area

The proposed site for the Mililani Community Transit Center is 1.0 to 1.5 acres on Meheula Parkway between Makaimoimo Street and Lanikuhana Street. The site comprises the area of the sidewalk and planting strip lying within the street right-of-way, as well as the Mililani Town Center's landscape strip and air rights above existing parking spaces. The existing Mililani Town Center parking supply will be reduced to five spaces or fewer to accommodate structural supports at the transit center adjacent to the Meheula Parkway frontage.

The transit center will provide ten bus bays with adjacent passenger waiting shelters, a comfort station, information kiosks and electronic displays. Two new access cuts will be made along the Meheula Parkway median to accommodate left turns by transit vehicles entering and exiting the transit center.

This analysis addresses the traffic impacts on the roadway network and key intersections adjacent to the project site. The study area for the Mililani Community Transit Center consists of the following intersections:

- Meheula Parkway at Makaimoimo Street
- Meheula Parkway at Lanikuhana Street.

Existing Roadways and Key Intersections

The following is a summary of the existing roadway network and key intersections within the project study area.

Meheula Parkway

Meheula Parkway is a wide four-lane divided arterial with an approximate right-of-way of 89 feet within the vicinity of the project site. Meheula Parkway is fully improved with curb and gutter on each side of the roadway. A grass median approximately 25 feet wide extends throughout the vicinity of the proposed site. The posted speed limit is 25 mph during school sessions.

Meheula Parkway at Makaimoimo Street

Meheula Parkway and Makaimoimo Street form a four-leg signalized intersection to the west of the proposed Mililani Transit Center. The eastbound Meheula Parkway approach has one left-turn lane, one through lane and one shared through/right-turn lane. The westbound approach is also striped for one left-turn lane, one through lane and one shared through/right-turn lane. The northbound Makaimoimo Street approach has one wide, 17-foot, all-movement lane that operates as one left-turn lane and one right-turn lane. The southbound approach of Makaimoimo Street serves as an access/egress point for Mililani High School. Left turns are permitted.

Meheula Parkway and Lanikuhana Street

Meheula Parkway and Lanikuhana Street also form a four-leg signalized intersection to the east of the project site. The eastbound approach of Meheula Parkway is striped for two left-turn lanes, one through lane and a shared through/right-turn lane. The westbound approach is striped for one left-turn lane, two through lanes and one shared/right-turn lane. The northbound approach (Lanikuhana Street) has one left-turn, one through and one right-turn lane. The southbound approach (Ho'okelewaa Street) has one shared lane. Left-turn movements are protected.

2

Existing Traffic Volumes and Growth Rate

Traffic Volumes

To determine the existing conditions at the five intersections under study, turning movement counts were taken in 15-minute increments from 6:45 A.M. to 8:30 A.M. and from 3:45 P.M. to 5:30 P.M. The peak hour is defined as that one-hour time period in which the highest volume of traffic is experienced. Table 1 displays the study intersections.

Table 1
Study Intersections

Community	Intersection
Waianae	Farrington Highway at Leihoku Street
Wahiawa	California Avenue at North Cane Street
Wahiawa	California Avenue at Lehua Street
Mililani	Meheula Parkway at Makaimoimo Street
Mililani	Meheula Parkway at Lanikuhana Street

The existing lane geometry for the study intersections is displayed in Figure 1. The existing peak hour intersection turning movement volumes, which include a vehicle mix of automobile, truck and bus traffic, are shown in Figures 2 through 4.

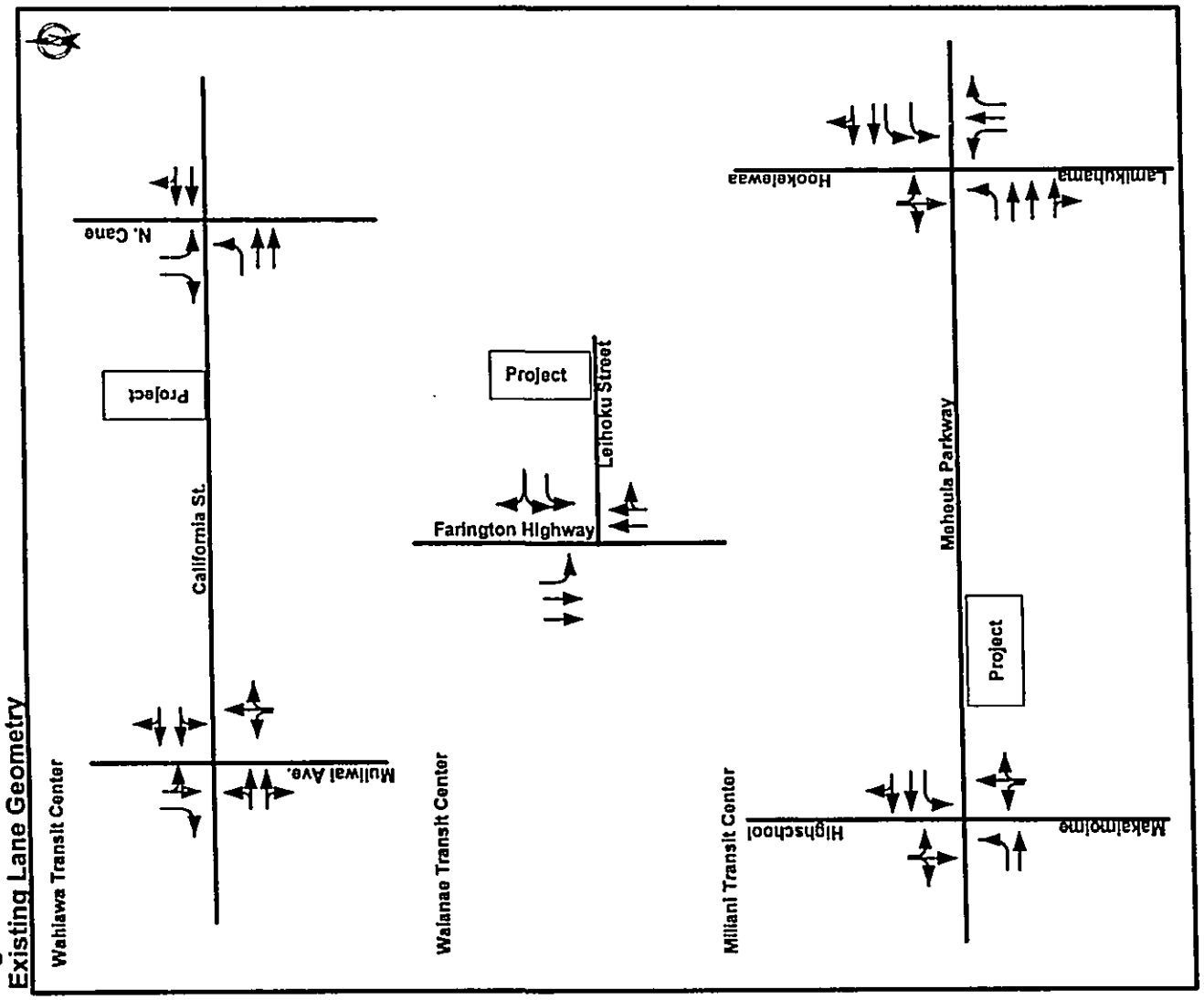


Figure 1
Existing Lane Geometry

PARSONS

Background Traffic Data

Background traffic is comprised of existing traffic plus traffic from approved, but not yet completed, developments in the vicinity of the proposed project sites.

In Waianae, an 8,000-square-foot YMCA is proposed directly across Leihoku Street from the proposed Waianae Coast Community Transit Center. In addition, there are potential long-term plans to build additional residential units in the valley, with the main access point being Leihoku Street. Typically, both projects would need to be accounted for; however, their timelines are such that the Waianae Transit Center will be constructed and operational before construction starts on either the YMCA or residential units.

In Mililani, there were no identifiable proposed projects in the immediate vicinity of the project site that would have any significant traffic impact within the timeline identified for completion of the Mililani Community Transit Center.

For the Wahiawa Community Transit Center, the State of Hawaii Judiciary is planning a new courthouse adjacent to the project site; in addition, the State of Hawaii Department of Accounting and General Services plans to provide additional state office space on the land adjacent to the project site. However, it is not anticipated that either of these projects will be approved or completed by the estimated completion date of July 2003 for the Wahiawa site.

Cumulative Growth Factor

Because the three transit center projects are not anticipated to be completed until summer/fall of 2003, a growth factor was applied to existing traffic to account for any natural increase in traffic during the approximate one-year time period. A conservative factor of two percent was applied to all movements to account for potential growth in traffic volume.

Figure 2
Waianae Transit Center

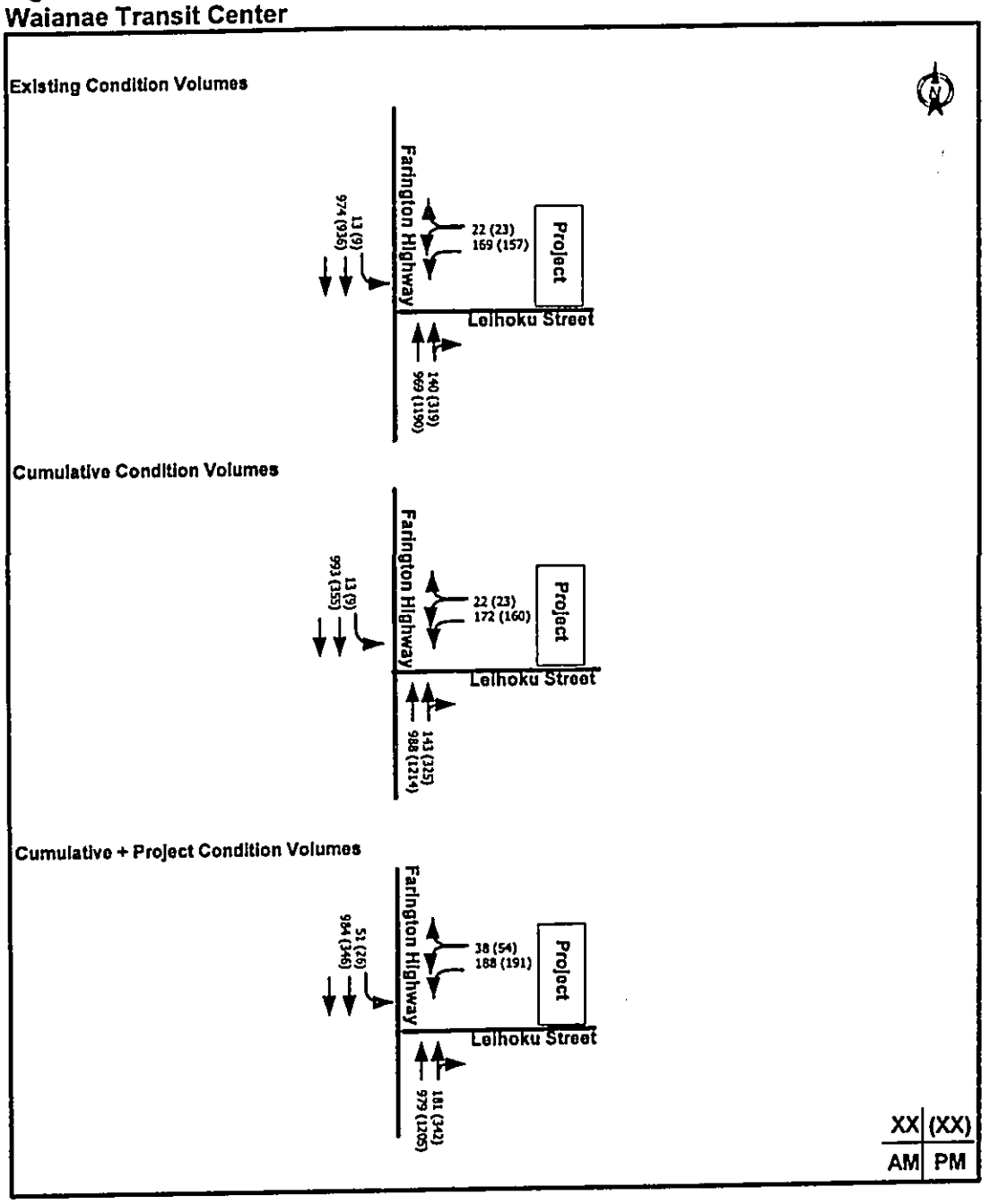


Figure 3
Wahiawa Transit Center

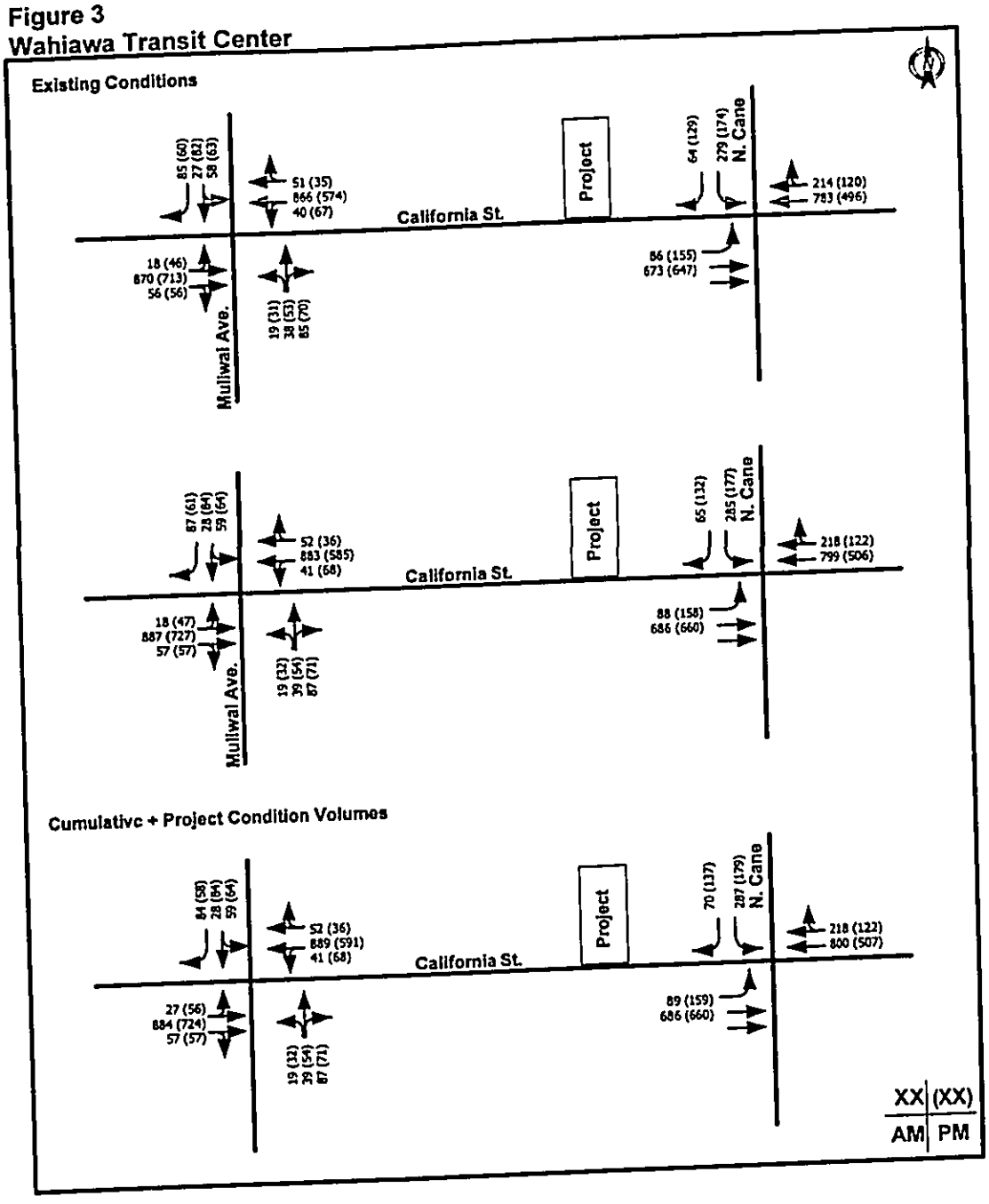
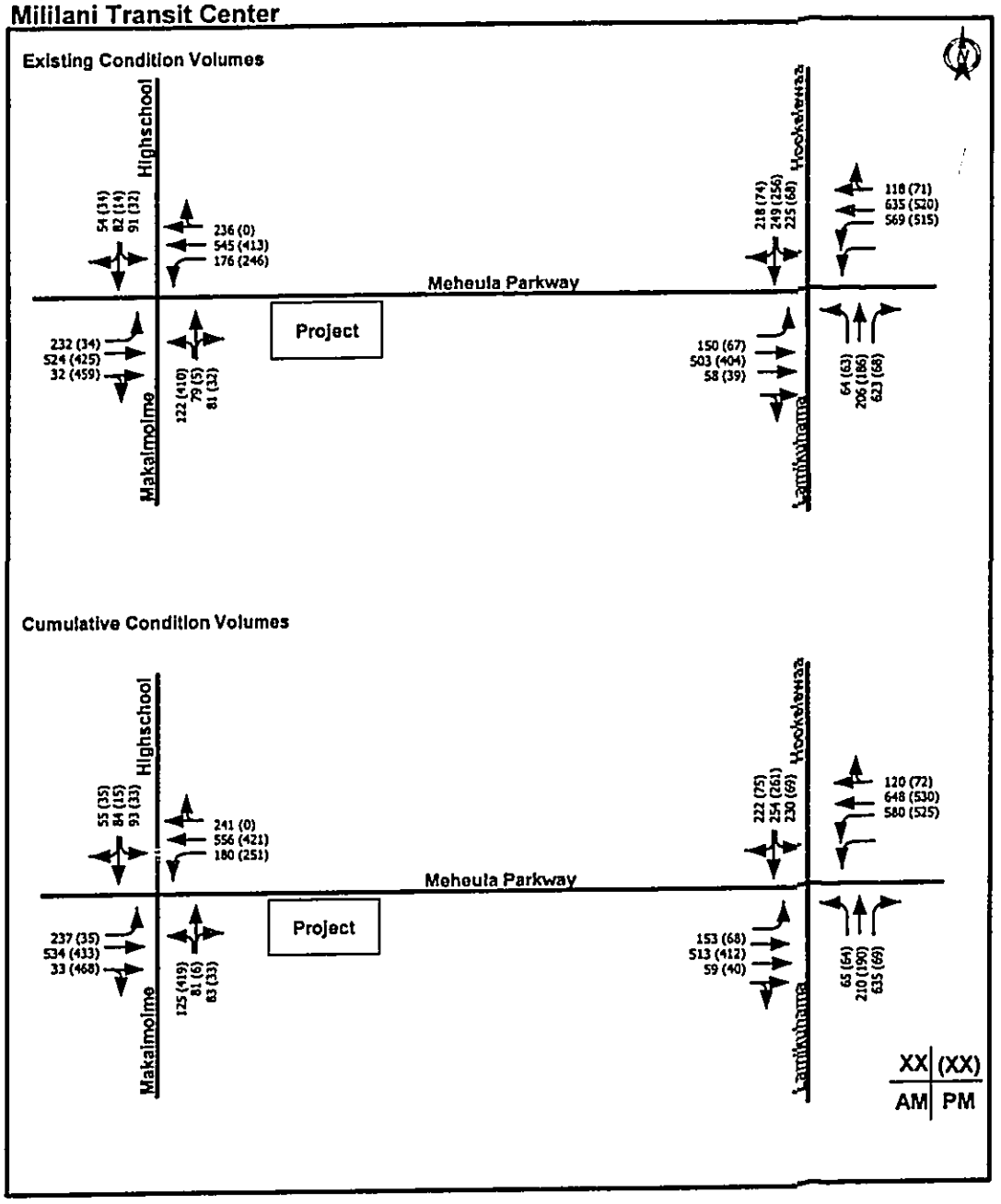


Figure 4
Mililani Transit Center



3

Trip Generation/Distribution/Assignment

Trip Generation

In order to properly determine the magnitude of the traffic impacts for the proposed transit centers on the proposed roadway network, trip generation rates for the project had to be determined. The trip generation rates for the three sites are divided into two elements:

1) Bus traffic

2) Park and ride/dropoffs

Bus Traffic

The trip generation for bus traffic at each of the three transit centers was determined in conjunction with Oahu Transit Services, Inc. and their consultants. They are in the process of implementing a Hub and Spoke Bus Transit System that will serve communities outside of Honolulu's primary urban center.

Service plans developed for each site indicate the routes, headways and number of peak buses for each of the three community transit centers. The specific routes that will operate at each of the three transit centers during the A.M. and P.M. peak hours are listed below in Tables 2 through 4.

Table 2
Waianae Transit Center A.M. and P.M. Peak Hour Bus Routes

Route Number	Existing		Proposed	
	Headway (min)	Buses per Hour	Headway (min)	Buses per Hour
C	30	4	30	4
40/40A	30	4	30	4
93	20	3	20	3
93A	One bus only	1	One bus only	1
401	60	1	60	1
402	60	1	60	1
403	60	1	60	1

Table 3
Wahiawa Transit Center A.M. and P.M. Peak Hour Bus Routes

Route Number	Existing		Proposed	
	Headway (min)	Buses per Hour	Headway (min)	Buses per Hour
52	30	4	30	4
62	30	4	30	4
83	Varies	1	—	—
83A	Varies	1	—	—
CE-E	—	—	30	2
50	—	—	60	1
51	—	—	60	1
511	—	—	60	1
512	—	—	60	1
513	—	—	60	1
514	—	—	60	1

Table 4
Mililani Transit Center A.M. and P.M. Peak Hour Bus Routes

Route Number	Existing		Proposed	
	Headway (min)	Buses per Hour	Headway (min)	Buses per Hour
52	30	4	30	4
83A	Varies	1	—	—
84A	30	4	—	—
CE–E	—	—	30	4
50	—	—	30	4
501A	—	—	30	2
501B	—	—	30	2
502	—	—	30	2
503	60	1	60	1

Park and Ride/Dropoffs

Of the three proposed transit centers, only the Waianae site will provide parking for a traditional park and ride lot. The Waianae Coast Community Transit Center will provide approximately 100 parking spaces for use by transit patrons. The Wahiawa site will provide approximately 45 spaces; however, they will be utilized primarily by state employees working adjacent to the project site. The Mililani site will provide no parking spaces and will displace approximately three to five spaces in the private parking lot for the shopping center.

Referring to the Institute of Transportation Engineers' (ITE) *Trip Generation, Sixth Edition*, the land use category Park and Ride Lot with Bus Service (land use code 090) is most applicable to the Waianae park and ride lot. A Park and Ride Lot with Bus Service is defined by ITE as follows:

> "Park and ride lots with bus service are areas used for the transfer of people between private vehicles and buses. They usually contain a bus passenger shelter, a parking lot and circulation facilities for buses, as well as for private vehicles. In addition to park and ride, there are a significant number of passengers who are dropped off."

The independent variable used to predict the peak hour trips to and from the Waianae Community Coast Transit Center is the number of parking spaces.

Assuming a total of 100 parking spaces, Table 5 illustrates the A.M. and P.M. peak-hour trip generation for the park and ride lot.

Table 5
Park and Ride Lot
A.M. and P.M. Peak Hour Trip Generation

Number of Parking Spaces	Average Trip Generation Rate	A.M. Peak Hour Trips Entering (80%)	Exiting (20%)
100	0.75	60	15

Number of Parking Spaces	Average Trip Generation Rate	P.M. Peak Hour Trips Entering (22%)	Exiting (78%)
100	0.63	14	49

Trip Distribution and Assignment

Trip distribution and assignment is the process that identifies the roadway network used in traveling to and from the project and the percentage of project-generated traffic that will use each roadway. Trip distribution was determined for the same two elements of the project used for trip generation:

1) Bus traffic

2) Park and ride/dropoffs

Bus Traffic

The trip distribution for projected bus traffic at the Waianae Coast Community Transit Center, the Wahiawa Community Transit Center and the Mililani Community Transit Center was determined by Oahu Transit Services, Inc., which operates Oahu's transit service, and their consultants, who developed the Hub and Spoke Transit Center plan.

In Wahiawa, in-bound buses will turn left onto Lehua Street from California Avenue, right on Kilani Avenue, right on North Cane Street, and either proceed into the transit center's driveway or turn right back onto California Avenue and into on-street bus bays.

In Waianae, hub services have already been implemented and will only change by being re-routed to the transit center on Leihoku Street.

In Mililani, routes of ingress and egress have not yet been finalized.

Park and Ride/Dropoffs

The trip distribution for the Waianae Coast Community Transit Center park and ride lot was based on an evaluation of the project vicinity for accessibility to the site. Generally, it was assumed that park and ride lot users' travel patterns would heavily favor Farrington Highway, the primary route used to access the site, with a small percentage destined to or originating from Leihoku Street. Again, note that only the Waianae site will provide park and ride facilities.

4

Traffic Analysis

Level of Service

Level of service (LOS) analysis is based on the methodology presented in the 2000 Highway Capacity Manual (HCM) published by the Transportation Research Board. LOS is based on a scale of six increments corresponding to a range of delay from A to F, where A is free-flowing traffic with almost no delay and F is heavily congested traffic with long delays. LOS and corresponding levels of delay are displayed in Table 6 for signalized intersections.

Table 6
Intersection Level of Service Definitions

LOS	Control Delay per Vehicle(s)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

LOS calculations for this report were prepared using Synchro version 5. Synchro is a traffic analysis software that utilizes the Highway Capacity methodology (2000 HCM*). Synchro LOS output sheets are contained in Appendix A. The City and County of Honolulu have established LOS D as the minimum acceptable threshold for signalized intersections in the A.M. and P.M. peak hours.

*The 2000 HCM (and 1997 HCM) use control delay rather than stopped delay used in the 1994 HCM and Synchro 3.2. Control delay is equal to stopped delay times 1.3. Caution is urged when comparing results from Synchro 3.2 and/or the 1994 method, because of the higher delay thresholds with the 2000 HCM.

Waianae

The intersection of Farrington Highway and Leihoku Street operates at LOS A in the A.M. and P.M. peak hours based on counts taken May 20, 2002. Although there are significant through movements both northbound and southbound on Farrington Highway, there are relatively insignificant volumes from Leihoku Street or turning left onto Leihoku Street from southbound Farrington Highway, resulting in few interruptions or delays for through traffic. The intersection continues to operate at LOS A in the cumulative and cumulative plus project phases.

Table 7
Existing Level of Service Summary—Waianae Transit Center

Intersection		A.M. Peak				P.M. Peak			
		Approach		Intersection		Approach		Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Farrington Highway/ Leihoku Street	NB	A	4.5	A	5.3	A	3.6	A	5.2
	SB	A	4.7			A	4.7		
	EB	—	—			—	—		
	WB	B	12.1			B	18		

Table 8
Cumulative Level of Service Summary—Waianae Transit Center

Intersection		A.M. Peak				P.M. Peak			
		Approach		Intersection		Approach		Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Farrington Highway/ Leihoku Street	NB	A	4.7	A	5.3	A	4.8	A	5.3
	SB	A	4.5			A	3.6		
	EB	—	—			—	—		
	WB	B	12.5			B	18.7		

Table 9
Cumulative Project Level of Service Summary—Waianae Transit Center

Intersection		A.M. Peak				P.M. Peak			
		Approach		Intersection		Approach		Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Farrington Highway/ Leihoku Street	NB	A	4.9	A	5.5	A	4.9	A	5.5
	SB	A	4.7			A	3.7		
	EB	—	—			—	—		
	WB	B	12.5			B	18.4		

Wahiawa

Overall, the intersection of California Avenue and North Cane Street operates at LOS A in the A.M. and P.M. peak hours. In the A.M., queues form southbound on North Cane Street extending upstream to Center Street. Eastbound queues on California Avenue typically extend upstream to the mid-block point. However, all queues are able to clear on one signal cycle.

The intersection of California Avenue and Lehua Street also operates at LOS A in both peak hours. As with the intersection of California Avenue at North Cane Street, there are heavy through volumes both eastbound and westbound. At this intersection, there are relatively minor side street volumes to interrupt the overall flow of traffic on the major street. It should be noted that there are no separate left-turn lanes on either approach of California Avenue. Existing left-turn volumes do not currently dictate the need for exclusive left-turn lanes; however, from an operational perspective, when the Hub and Spoke Plan is implemented in Wahiawa, signal phasing and striping adjustments may be warranted.

Table 10
Existing Level of Service Summary—Wahiawa Transit Center

Intersection		A.M. Peak Approach LOS	A.M. Peak Approach Delay	A.M. Peak Intersection LOS	A.M. Peak Intersection Delay	P.M. Peak Approach LOS	P.M. Peak Approach Delay	P.M. Peak Intersection LOS	P.M. Peak Intersection Delay
California Avenue/ North Cane Street	NB	—	—	A	7.8	—	—	A	6.2
	SB	B	12.2			A	8.5		
	EB	A	7.0			A	6.2		
	WB	A	7.0			A	5.1		
California Avenue/ Lehua Street	NB	A	7.1	A	5.3	A	7.3	A	5.2
	SB	A	9.0			A	9.6		
	EB	A	5.6			A	6.4		
	WB	A	5.8			A	6.3		

Table 11
Cumulative Level of Service Summary—Wahiawa Transit Center

Intersection		A.M. Peak Approach LOS	A.M. Peak Approach Delay	A.M. Peak Intersection LOS	A.M. Peak Intersection Delay	P.M. Peak Approach LOS	P.M. Peak Approach Delay	P.M. Peak Intersection LOS	P.M. Peak Intersection Delay
California Avenue/ North Cane Street	NB	—	—	A	8.0	—	—	A	6.3
	SB	B	12.4			A	8.7		
	EB	A	7.1			A	6.2		
	WB	A	7.1			A	5.1		
California Avenue/ Lehua Street	NB	A	7.4	A	6.1	A	7.4	A	6.9
	SB	A	9.5			A	9.7		
	EB	A	5.6			A	6.5		
	WB	A	5.8			A	6.4		

Mililani

The intersection of Meheula Parkway and Makaimoimo Street operates overall at LOS B and C, respectively, in the A.M. and P.M. peak hours. This intersection provides direct access to the Mililani Town Center, Mililani High School and Walmart. There are significant westbound left-turn movements from Meheula Parkway onto southbound Makaimoimo Street. Left-turn movements on both Meheula Parkway approaches are protected. Northbound and southbound left turns from Makaimoimo Street are not protected.

The intersection of Meheula Parkway and Lanikuhana Street operates overall at LOS D and B, respectively, in the A.M. and P.M. peak hours. This intersection also provides direct access to the Mililani Town Center and Walmart. There are significant left-turn movements that queue in both the A.M. and P.M. peak hours on westbound Meheula Parkway. However, these left turns generally clear on one signal cycle. The southbound approach of Lanikuhana Street, Ho'okelewaa Street also experiences significant queues in the peak periods. Left-turn movements from Meheula Parkway are protected.

Table 12
Existing Level of Service Summary—Mililani Transit Center

Intersection		A.M. Peak				P.M. Peak			
		Approach		Intersection		Approach		Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Meheula Parkway/ Makaimoimo Street	NB	B	18.8	B	19.0	C	30.0	C	27.6
	SB	B	15.8			B	10.1		
	EB	B	19.7			C	27.6		
	WB	B	19.2			C	28.1		
Meheula Parkway/ Lanikuhana Street	NB	A	7.7	D	41.7	B	12.7	B	19.0
	SB	E	63.1			B	18.0		
	EB	D	43.0			C	24.0		
	WB	D	52.8			B	18.9		

Table 13
Cumulative Level of Service Summary—Mililani Transit Center

Intersection		A.M. Peak				P.M. Peak			
		Approach		Intersection		Approach		Intersection	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
California Avenue/ North Cane Street	NB	B	19.9	B	19.4	C	32.1	C	29.7
	SB	B	16.0			B	10.2		
	EB	C	20.2			C	30.1		
	WB	B	19.4			C	29.7		
California Avenue/ Lehua Street	NB	A	7.8	D	43.4	B	12.9	B	19.4
	SB	E	71.3			B	18.2		
	EB	D	43.8			C	24.5		
	WB	D	52.8			B	19.3		

5

Additional Traffic Analysis

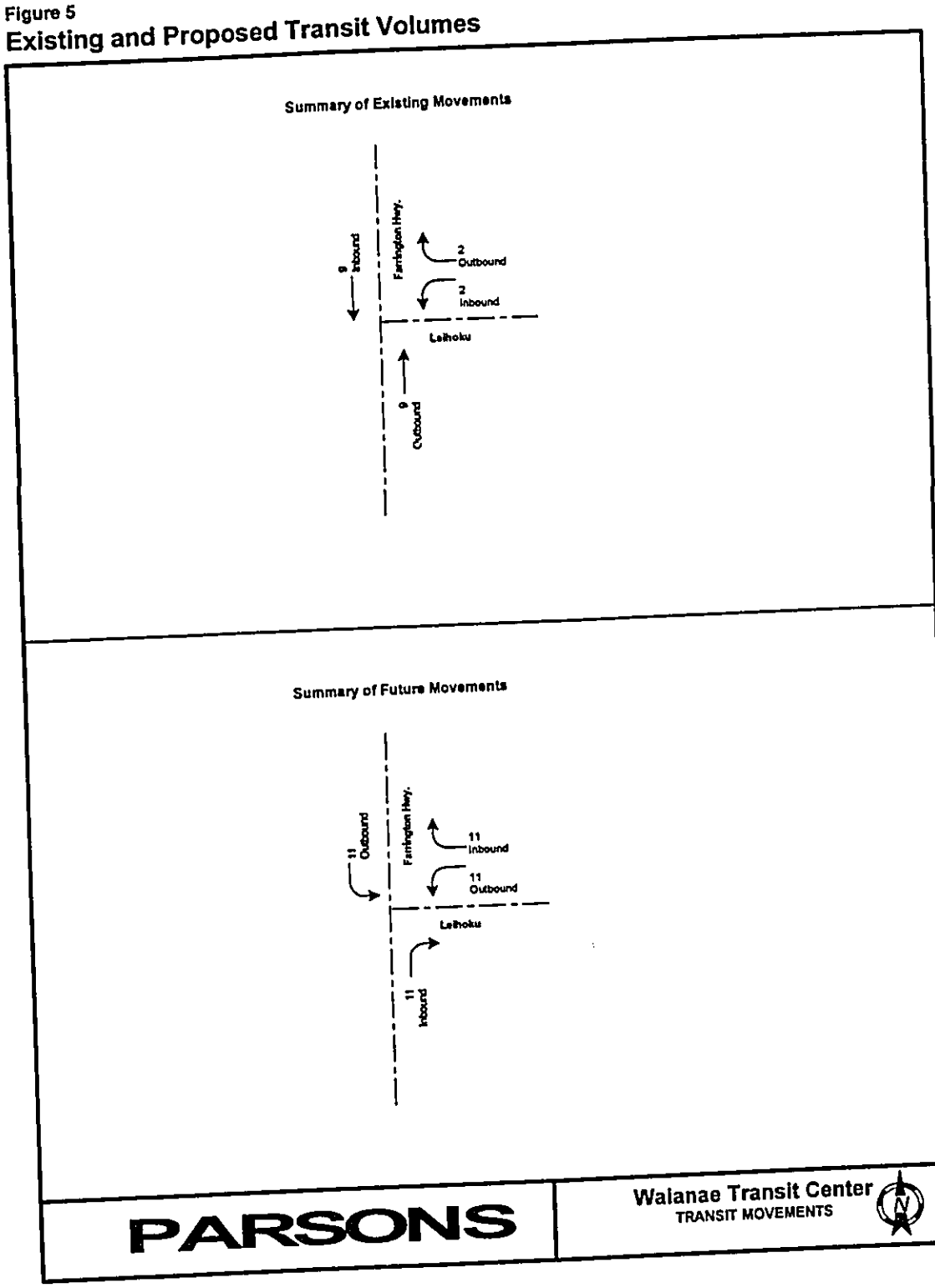
Bus Operational Analysis—Waianae

From an operational perspective, bus service in Waianae will remain relatively unchanged once the Community Transit Center comes on-line. Essentially, the existing schedule also represents the service that will utilize the transit center in the future. The existing service will be re-routed up Leihoku Street to the transit center, where the buses will dwell before pulsing en masse to their destinations.

Although the number of buses passing through the transit center will not change, the turning movements at the intersection of Farrington Avenue and Leihoku Street will differ. In the future, northbound buses on Farrington Highway will turn east onto Leihoku Street and enter the transit center before continuing northbound. This will be facilitated by a right-turn movement from Leihoku Street onto northbound Farrington Highway. Likewise, buses traveling southbound on Farrington Highway will turn left at the intersection before entering the transit center. They will continue their trip by making a left-turn movement from Leihoku Street onto southbound Farrington Highway.

The additional eastbound right turns can be easily accommodated from Farrington Highway onto Leihoku Street, as can the corresponding right turns from Leihoku Street onto eastbound Farrington Highway. There is sufficient storage in the left-turn bay to accommodate the left-turn movements from northbound Farrington Highway onto Leihoku Street and the corresponding left-turn movements from Leihoku Street onto southbound Farrington Highway.

Figure 5
Existing and Proposed Transit Volumes



Bus Operational Analysis—Wahiawa

The proposed Wahiawa Hub and Spoke Service Plan reflects an increase in service from what is currently provided by approximately six buses in the A.M. and P.M. peak hours.

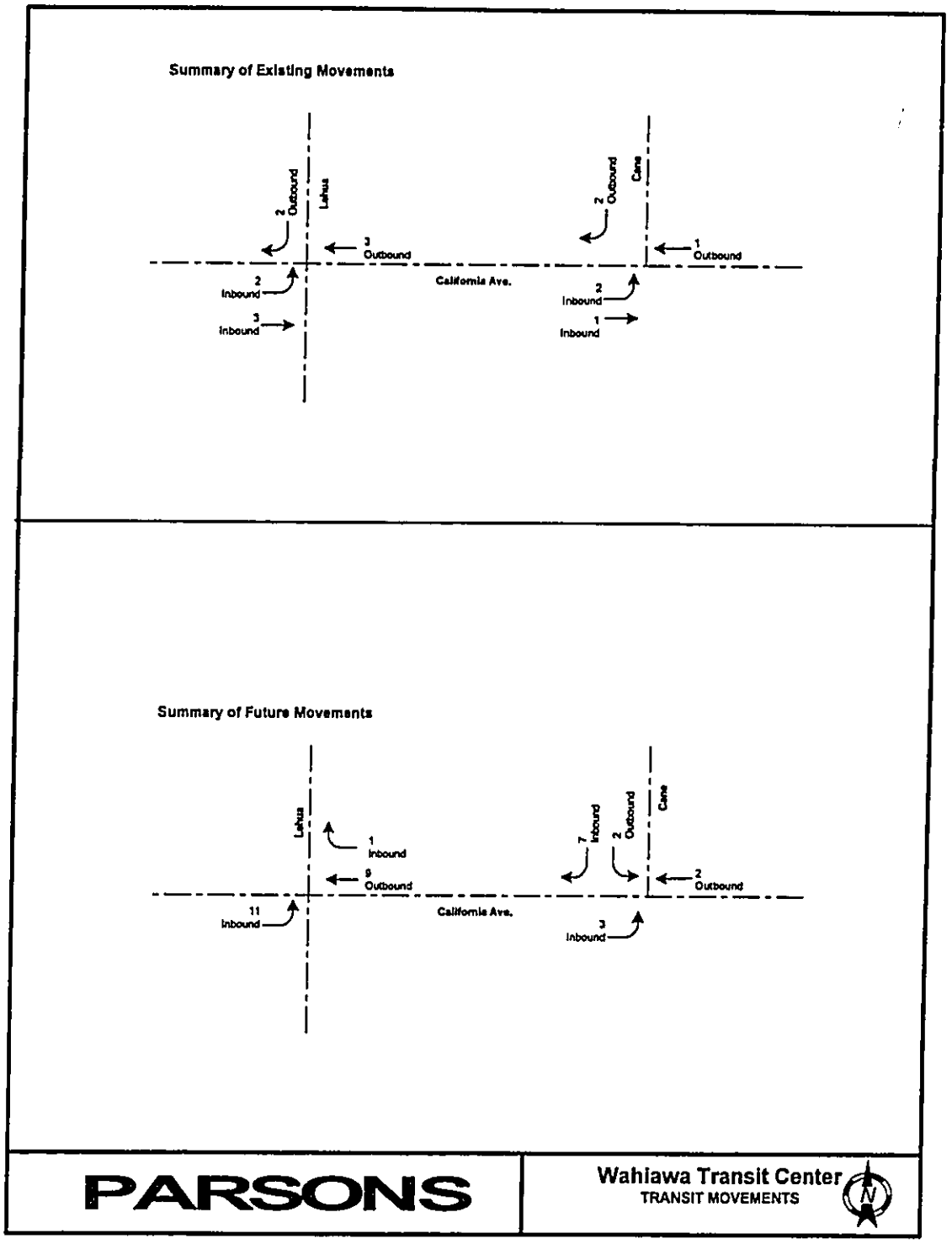
The predominant movement at the Wahiawa hub becomes an eastbound left-turn movement from California Avenue onto Lehua Street, a right turn onto Kilani Avenue, a right at North Cane Street, then either a right turn onto Center Street and into the transit center or a right turn onto California Avenue (westbound) adjacent to the center.

Lacking heavy opposing left-turn movements at Lehua Street/Kilani Avenue and Kilani Avenue/North Cane Avenue and with no opposing left-turn movements at California Avenue/North Cane Avenue, the additional right-turn movements can easily be accommodated without any operational impacts.

The predominant left-turn movement, however, must be made from a shared left-turn/through lane on eastbound California Avenue onto northbound Lehua Street. The left turns are not protected and with heavy through movements westbound, queues are likely to form, inhibiting the ability of the buses to make the left-turn movement in one signal cycle.

Figure 6

Existing and Proposed Transit Volumes



Bus Operational Analysis—Mililani

The key component of the proposed Mililani Hub and Spoke Plan is two median breaks on Meheula Parkway between Makaimoimo Street and Lanikuhana Street. These median breaks provide for access to and egress from the Mililani Transit Center located along the frontage of the Mililani Town Center.

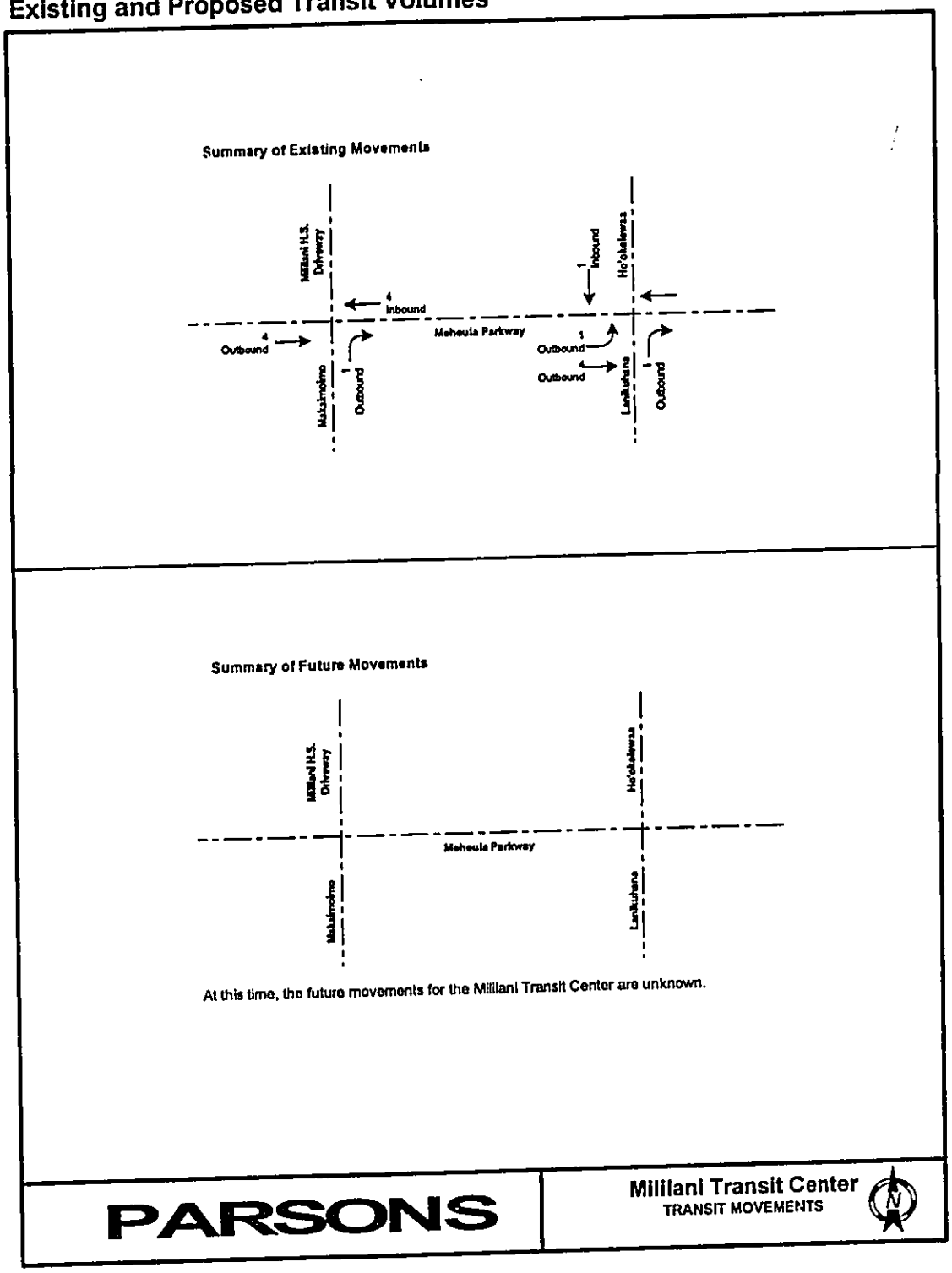
The first median break, westbound on Meheula Parkway just west of Lanikuhana Street will provide a left-turn bay for buses only to access the transit center. The second median break, just east of Makaimoimo Street, will provide for egress from the transit center and allow buses to continue westbound on Meheula Parkway.

To successfully implement this proposal and minimize impacts to the transportation infrastructure, the left-turn bay providing access to the transit center should provide sufficient storage capacity for a minimum of two buses.

To facilitate egress from the transit center, detector loops should be placed in the driveway of the center to stop traffic on all approaches at the intersections of Meheula Parkway and Lanikuhana Street and Meheula Parkway and Makaimoimo Street. A second option would be to stop all eastbound and westbound traffic on Meheula Parkway and allow the minor street traffic to continue. These options will provide for sufficient gaps in traffic flow and allow buses to cross eastbound Meheula Parkway and enter westbound Meheula Parkway without major conflicts with through traffic.

With only two pulses per hour, there would be minimal disruption to the overall flow of traffic.

Figure 7
Existing and Proposed Transit Volumes



6

Conclusions and Recommendations

Waianae

The completion of the Waianae Coast Community Transit Center will have no significant traffic impact within the project study area. Transit service levels in Waianae have already been increased to the level that will serve the proposed transit center. Transit routes will only be modified at the intersection of Farrington Highway and Leihoku Street, which provides direct access to the future transit center. No level of service or operational impacts are associated with this plan.

Wahiawa

The completion of the Wahiawa Community Transit Center will have less than significant impacts within the project study area. Although transit service levels will be increased from existing conditions with the implementation of the Hub and Spoke Plan, the frequency of the pulse system and the physical orientation of the transit center will minimize any impacts.

The predominant movement into the transit center from California Avenue will be a right-turn movement, which can be made very efficiently. It is recommended, though, that the signal phasing and/or striping be modified on the eastbound approach of California Avenue and Lehua Avenue to facilitate the left-turn movement. Currently, left turns must be made from a shared left-turn/through lane. Left-turn traffic must wait for a gap in westbound traffic to complete this maneuver. Heavy westbound through movements make left turns somewhat problematic during peak periods. With the addition of approximately nine buses in the peak hours, this lane may queue upstream to the next intersection as the buses wait for a sufficient gap. Modifying the phasing on the eastbound approach to add a protected/permitted phase will

allow eastbound traffic to proceed first, unopposed. After the protected phase ends, left turns can still be made on the permitted phase as gaps allow. A second option would be to re-stripe the shared left-turn/through lane as a single left-turn lane and implement a protected left-turn phase. This option would, however, restrict the capacity for through traffic at this location.

Mililani

The completion of the Mililani Community Transit Center is expected to have some operational impacts, which can be lessened with mitigations. The transit center will necessitate two median breaks on Meheula Parkway to facilitate access and egress to the transit center. It is recommended that the median break west of Lanikuhana, which provides access to the transit center, provide for storage for at least two 40-foot buses. This will prevent buses from blocking through traffic westbound on Meheula Parkway as they wait for gaps in traffic eastbound.

The median break that allows for egress from the proposed transit center, will significantly shorten the existing westbound left-turn bay at Meheula Parkway and Makaimoimo Street. As there are heavy left-turn movements from this lane to the Mililani Town Center and Walmart, additional storage capacity should be provided to the east of the median break.

In order to facilitate egress from the transit center, it is also recommended that loop detectors be installed in the project driveway. The loops would serve to stop traffic on all approaches at the intersections of Meheula Parkway/ Makaimoimo Street and Meheula Parkway/Lanikuhana Street or to stop the predominant eastbound/westbound through traffic and allow minor street traffic to proceed. This would minimize vehicular/bus conflicts and create gaps for efficient egress.

APPENDIX C

Air Quality Environmental Assessment Final Report

Prepared by The Environmental Company, Inc., June 2002

Partners, Inc.

AIR QUALITY
ENVIRONMENTAL ASSESSMENT
FINAL REPORT

at

Waianae Coast Community Transit Center

(AMP Project No. A0096.20)

June 2002

Prepared for:

AM Partners, Inc.
1164 Bishop St., Suite 1000
Honolulu, HI 96813

Prepared by:

The Environmental Company, Inc.

Air Quality Environmental Assessment

Final Report

Waianae Coast Community Bus Transit Center

86-052 Leihoku Street, Waianae, Hawaii

June 2002

Prepared for:

AM Partners, Inc

Prepared by:

The Environmental Company, Inc.
1001 Bishop St., Pauahi Tower, Suite 1240
Honolulu, Hi 96813

TABLE OF CONTENT

EXECUTIVE SUMMARY

The Honolulu City & County Department of Transportation Services is proposing to construct the Waianae Coast Community Bus Transit Center at 86-052 Leihoku Street, Waianae, Hawaii. The proposed project will consist of seven (7) bus bays along with passenger waiting facilities and other ancillary facilities. The project is expected to be completed at the end of July, 2003 and will result in increased emissions due to exhaust from the increased bus activity at the said location. This study examines the potential short- and long-term air quality impacts that may occur as a result of these extra exhaust emissions and includes potential impact due to construction activities. In addition, this study suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate.

Both Federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated, including particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are more stringent than the comparable national standards except for those pertaining to sulfur dioxide and particulate matter.

Regional and local climate, together with the amount and type of human activity generally dictate the air quality at the project site. Trade winds dominate in the region. Rough terrain plays an important role in local wind pattern. During winter, occasional storms may generate strong winds from the south (kona winds) for brief periods. When the trade winds or kona winds are weak or absent, landbreeze-seabreeze circulations or mountain drainage winds may develop. Wind speeds are often lower compared to more exposed coastal locations, but the trade winds still provide relatively good ventilation much of the time. Temperatures in the Oahu area leeward of the Koolaus are generally very moderate with average daily temperatures ranging from about 70 Fahrenheit (°F) to 85°F. Extreme temperatures range from about 53°F to about 95°F. Rainfall in the Waianae area is relatively low, averaging about 20 inches per year.

The present air quality at the project site appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all national ambient air quality standards are currently being met, although occasional exceedances of the more stringent state standard for ozone may occur.

The resulting increase in the air pollution due to bus emission at the Waianae Coast Bus Transit Center was found to be relatively smaller than the significant emission rates as defined in the Hawaii Administrative Rules. Therefore, it is unlikely that any measurable impacts on air quality will occur. Implementing any air quality mitigation measures for long-term impacts from the proposed project is probably unnecessary and unwarranted.

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

The Department of Transportation Services (DTS), City and County of Honolulu is proposing to construct and operate the Waianae Coast Community Bus Transit Center on the island of Oahu, Hawaii. The proposed project will have seven (7) bus bays with passengers waiting facilities and other ancillary facilities. It will have circulator service line and a trunk line serving the Waianae and Honolulu route and is expected to start operation by the end of July 2003. This air quality assessment will be part of the basis to determine whether a more detailed environmental assessment is needed for the proposed development.

The Environmental Company, Inc. (TEC, Inc.) conducted an air quality environmental assessment during the month of May 2002 to estimate the impact of future increased emissions due to activities at the Bus Transit Center. To ascertain the potential of the air quality impact on the project, the maximum annual bus volume was predicted for the Transit Center as a worst case scenario. The purpose of this study is to describe existing air quality in the project area and to assess the potential long-term direct and indirect air quality impacts that could result from the use of the proposed facilities. Measures to mitigate these impacts are suggested where possible and appropriate.

1.2 PROJECT OVERVIEW

1.2.1 Site Description

The proposed **Waianae Coast Community Bus Transit Center** is located at 86-052 Leihoku Street, Waianae, HI on a portion of TMK 8-6-1:29 adjacent to the Waianae Mall (Fig. 1.1, Site Map). The site is currently occupied by a fenced warehouse structure (Fig. 1.2). Across the street is the Waianae YMCA located south-east of the transit site while to the south is the Waianae Waste Water Treatment Plant (Fig. 1.3 and 1.4). The Transit Center will occupy an area of approximately 2.82 acres zoned as I-2, Intensive Industrial. The areas surrounding the proposed site are zoned residential with light commercial activities at the adjacent Waianae Mall (Fig. 1.5).

The Transit Center will provide seven bays for TheBus and paratransit vehicles, arranged around a central "island" that include passenger waiting shelters, a comfort station with restrooms, vending and information kiosks, landscaping, bike parking, lockers, and a "gathering place" feature. The facility will also provide three bays for private school buses, a passenger drop-off/pick-up area, and parking for approximately 100 vehicles. The Transit Center will operate circulator lines that would service the leeward coast area and a trunk line that will serve the Waianae and Downtown Honolulu route.

1.2.2 Interviews

Mr. James Burke of DTS described the activities at the proposed Bus Transit Center including the bus schedule and dwell time or wait-time for the buses to load and unload passengers. He also indicated that there will be 5 regular buses and 2 articulated buses to service the Transit Center. Finally, Mr. Burke concurred with the air quality assessment strategy that utilizes maximum allowable bus traffic at the Transit Center,

which represents a worst case scenario as the basis for calculating the annual volume of buses expected at the center.

In an effort to calculate annual emission volumes at the proposed Bus Transit Center, TEC, requested actual emission data from Mr. Rick Hardy of the Oahu Transit Services, Inc. Mr. Hardy explained that these data are not available because emissions from existing buses have not been monitored. He further explained that the Oahu Transit Services Inc. follow a strict maintenance schedule on their engines as per manufacturer specification. He explained that currently, buses serving the island of Oahu are equipped with diesel engines (Detroit Diesel Series 50) that have been tested and approved by the United State Environmental Protection Agency (EPA) prior to commercial production. Furthermore, he indicated that a $9,000 rebuild kit is used on a regular basis to ensure that each engine performs within the allowable EPA emission standard for heavy duty engines.

Pacific Detroit Diesel Company, through the help of Ms. Stella Yara, provided the EPA Emission standard (Table 1) and indicated that the regular buses at the Oahu Transit Services, use 1993 to 1998 model of the Series 50 diesel engines. The articulated buses use the 1999 Series 50 diesel engine. She reiterated that no actual emission data on the currently used buses on Oahu are available.

The Hawaii Department of Health (HDOH) through the help of Ms. Liza Young, provided Hawaii air quality data, including the Hawaii and EPA standards for the six criteria pollutants (Table 2). She further reinforced the claim of Mr. Hardy and Ms. Yara that automobile emission data are not available in the state of Hawaii and it is not required for the Oahu Transit Services to provide these data. The HDOH relies on the air monitoring stations strategically located in Oahu to monitor the amount of engine emission in the environment (Fig. 1.6).

1.2.3 Annual Bus Volume

The Waianae Coast Community Bus Transit Center is expected to operate 24 hours daily. The Transit Center will be serviced by 5 regular buses and 2 articulated buses. Seven buses (circulators and trunk line) will be operating for 16 hours a day and two trunk line buses for the next 8 hours. The service plan for the Transit Center reflects a "pulse" of activity about every ½ hour when the circulators and the trunk lines services are expected to meet at the Transit Center. The loading dwell time is about 3 to 5 minutes to allow the bus to load and unload passengers. It is assumed that the bus will be running in idle mode over this period in order to operate the air-conditioning system.

In order to assess the impact of the Transit Center on the quality of the ambient air, the air quality environmental assessment was evaluated on a worst case scenario. This scenario consisted of assuming that the Bus service remains on normal weekday schedule 365 days a year. Actual buses operate on a limited schedule on weekends and holidays. In addition, all buses at the station are assumed to be in idle mode while waiting for passengers. The route numbers and service span for the Transit Center are based on Draft Central Oahu Hub and Spoke Service Plan and current public timetable for the existing service. Based on the above assumptions, the worst case scenario estimated 93,440 buses expected to visit the Waianae Coast Community Bus Transit Center each year.

2.0 AIR QUALITY ENVIRONMENTAL ASSESSMENT

2.1 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 2 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, Federal and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants have the potential to create or exacerbate some form of adverse health effects or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit, and the state 1-hour limit for ozone is more than two times as stringent as the national 1-hour standard. The national 1-hour ozone standard will be phased out (pending court appeal) the next few years in favor of the new (and more stringent) 8-hour standard (Table 2).

The Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its airborne particulate standards to follow those set by the Federal government. During 1997, the Federal government again revised its standards for particulate, but the new standards have been challenged in Federal court. To date, the HDOH has not updated the state particulate standards.

2.2 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state and most of the year, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. Waianae, the site of the proposed project, is a suburban area within the City and County of Honolulu. Waianae is located leeward of the Waianae Range. Although climatic conditions vary somewhat across the project area, long-term weather data available from the Honolulu International Airport, located a few miles to the southeast, is at least semi-representative.

Wind frequency data given in Table 3 for Honolulu International Airport show that the annual prevailing wind direction for this area of Oahu is east northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and nearly 75 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent occurring only a few days during the year and mostly in association with winter storms. Wind speeds average about 11 mph (10 knots) and mostly vary between about 4 and 18 mph (5 and 15 knots). Surface wind speeds in the project area are somewhat lighter, and local wind directions are likely affected by the terrain.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade wind tend to have the least temperature variation, while inland and leeward areas often have the most. The project area's leeward location results in a relatively moderate temperature profile compared to some other locations around Oahu and the state. At the airport, average annual daily minimum and maximum temperatures are 70°F and 84°F, respectively [1]. The extreme minimum temperature was 53°F during January 1998, and the extreme maximum was 95°F during September 1994. Temperatures in the Waianae area may be slightly higher compared to the airport due to wind-sheltering effects.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is often measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In suburban areas, like those in

the project area, stability class 5 or 6 is generally the highest stability class that occurs, developing during the nighttime and early morning.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in the state typically are above 3,000 feet (1,000 meters).

Rainfall can have a beneficial effect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water-soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Waianae area is one of the drier areas on Oahu due to its *leeward and near sea level location.* Average annual rainfall amounts to about 20 inches [2].

2.3 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent by natural sources. Table 4 presents an air pollutant emission summary for the island of Oahu for calendar year 1993. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Oahu originate from area sources, such as the mineral products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxides emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources. Based on previous emission inventories that have been reported for Oahu, it appears that emissions of particulate and nitrogen oxides have increased during the past ten years, while emissions of sulfur oxides, carbon monoxide and hydrocarbons have declined.

Roadways in the vicinity of the Transit Center site carry moderate volumes of motor vehicle traffic at times, and roadway intersections may be congested during peak traffic hours. Emissions from motor vehicles using these roadways, primarily nitrogen oxides and carbon monoxide, may cause localized impacts on air quality.

At the proposed site of the Waianae Coast Transit Center, the nearest industrial source of air pollution is the Waianae Wastewater Treatment Plant, which is located a few hundred feet to the south. Wastewater treatment plants emit hydrogen sulfide, which can cause odor nuisance even at very low concentrations. Kahe Power Plant is situated about 7 miles to the southeast, and adjacent to this is the Waimanalo Gulch Sanitary Landfill. Campbell Industrial Park is located about 12 miles to the southeast. Emissions

from these facilities consist primarily of sulfur dioxide, nitrogen oxides and particulate. Due to the prevailing wind pattern in the area, it is unlikely that emissions from these sources cause any chronic impacts on air quality in the Waianae area, but occasional impacts may occur with south winds.

With the demise of sugarcane growing on the Ewa Plain, air pollutions impacts from agriculture have significantly diminished in the area. Agriculture-related emissions in the Waianae area consist mostly of particulate matter from small-scale operations. Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawaii.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station, however, typically does not monitor the full complement of air quality parameters. Table 5 shows annual summaries of air quality measurements that were made nearest to the project area for several of the regulated air pollutants for the period 1996 through 2000. These are the most recent data that are currently available.

During the 1996-2000 period, sulfur dioxide was monitored by the State Department of Health at an air quality station located at Kapolei. Concentrations monitored were consistently low compared to the standards. Annual second-highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 17 to 64 $\mu g/m^3$, while the annual second-highest 24-hour concentrations ranged from 5 to 16 $\mu g/m^3$. Annual average concentrations were only about 1 to 2 $\mu g/m^3$. There were no exceedances of the state/national 3-hour (1,300 $\mu g/m^3$) or 24-hour (365 $\mu g/m^3$) AAQS for sulfur dioxide during the 5-year period.

Particulate matter less than 10 microns in diameter (PM-10) is also measured at the Kapolei monitoring station. Annual second-highest 24-hour PM-10 concentrations ranged from 26 to 129 $\mu g/m^3$ between 1996 and 2000. Average annual concentrations ranged from 13 to 19 $\mu g/m^3$. All values reported were within the state and national AAQS (50 $\mu g/m^3$ and 150 $\mu g/m^3$ for the average annual and annual values respectively).

Carbon monoxide measurements were also made at the Kapolei monitoring station. The annual second-highest 1-hour concentrations ranged from 1.2 to 1.7 mg/m^3. The annual second-highest 8-hour concentrations ranged from 0.6 to 0.8 mg/m^3. No exceedances of the state 1-hour (10 mg/m^3) or 8-hour (5 mg/m^3) AAQS were reported.

Nitrogen dioxide is also monitored by the Department of Health at the Kapolei monitoring station. Annual average concentrations of this pollutant ranged from 2 to 9 $\mu g/m^3$, safely inside the state and national AAQS at 70 $\mu g/m^3$ and 100 $\mu g/m^3$ respectively.

The nearest available ozone measurements were obtained at Sand Island (about 25 miles southeast of the project area). The second-highest 1-hour concentrations for each year from 1996 to 2000 ranged from 91 to 110 $\mu g/m^3$. Up to 13 exceedances of the state AAQS (100 $\mu g/m^3$ per year) were recorded during the monitoring period. No specific trend is discernable, although the number of exceedances was lower during the latter half of the five-year period.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS of 1.5 $\mu g/m^3$ were recorded. Monitoring for this parameter was discontinued during 1997.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide, particulate matter and lead are currently being met at the project site. Due to the abundance of ozone in the state of Hawaii, it is likely, that the state AAQS for ozone may be exceeded on occasion based on the Sand Island measurements for this parameter. The abundance of ozone is greatly influence by the amount of sunshine in the state. While carbon monoxide measurements at the Kapolei monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections.

2.4 PROJECT IMPACT

2.4.1 Bus Emissions

The proposed facilities will result in increased bus traffic on nearby roadways, potentially causing long-term impacts on ambient air quality in the vicinity of the Transit Center where the buses will congregate. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide, and they also emit nitrogen oxides and other contaminates. In urban and suburban areas, carbon monoxide emissions near congested roadway intersections are the usual issue. In the case of diesel-powered buses, however, the primary air pollution emissions consist of nitrogen oxides and particulate matter. Carbon monoxide emissions are generally inconsequential compared to automobile emissions.

Although computer models can generally be used to assess the impacts of carbon monoxide emissions from motor vehicle traffic, it is probably impractical to attempt to quantitatively model the bus emissions of nitrogen oxides and particulate that may be associated with the proposed facilities. In lieu of this, annual emissions from project bus operations in the vicinity of the Waianae Coast Transit Center was estimated and compared to the "significant" emission rates as defined in the Hawaii Administrative Rules. Strictly speaking, the significant emission rates are intended to be applied to stationary point sources and not mobile sources such as bus traffic. Nevertheless, it is believed that this will provide a reasonable approach to ascertaining the significance of the project-related emissions of nitrogen oxides and particulate. If the project emissions are shown to be below the significant emissions rates, this is usually taken to indicate that a more detailed assessment of the emissions is not warranted.

To begin the evaluation of the potential long-term impacts on air quality related to the proposed facilities, the annual bus volumes at Waianae Coast Transit Center was estimated. This was done by first identifying the bus routes that would include each Transit Center and then reviewing the schedules for these routes to enumerate the buses each day that would be associated with each route at the Transit Center. Table 6 shows the estimated annual bus volume at the Waianae Coast Transit Center and the basis for the estimate. As indicated in the table, the expected total annual bus volumes at the facility is 93,440. As noted in the table, these estimates assume that weekend service will be the

same as weekday service. Actual annual bus volumes will be somewhat lower due to reduced service on weekends and holidays.

Buses using the proposed Transit Center will emit air pollution on approach, during idle and as they depart. To estimate the bus emissions during these modes of operation, the EPA computer model MOBILE6.1 [5] was used in combination with the expected annual bus volumes. MOBILE6.1 can be used to provide composite emission factors for a given year, vehicle class, average vehicle speed and ambient air temperature. The composite emission factors generally pertain to various modes of operation (acceleration, cruise, deceleration and idle) and are specified in terms of grams per vehicle mile of travel. Idle emission rates in terms of grams per minute can be estimated separately. For this project, MOBILE6.1 was used to estimate emission factors for the heavy-duty diesel vehicle (HDDV) class. Emission factors for nitrogen oxides, particulate, volatile organic compounds (VOC), carbon monoxide and sulfur dioxide were calculated for the year 2003, the expected year of project completion. Due to new emission standards for this class of vehicle that will be phased in during the next several years, emissions of nitrogen oxides and particulate will diminish in later years. An average annual temperature of 77°F was assumed, and it was further assumed that the average approach and departure speeds would be 25 mph.

Table 7 shows the resulting estimated composite and idle emission factors for HDDV. Nitrogen oxides emissions are the most appreciable followed by carbon monoxide, volatile organic compounds, sulfur dioxide and particulate. It is worth noting that carbon monoxide emissions from light-duty gasoline vehicles (LDGV) are about five times higher per vehicle mile of travel than are those for HDDV.

The next task is to determine the total vehicle miles and bus idle times associated with the Transit Center. A reasonable but somewhat arbitrary assumption is that emissions that occur beyond 1 mile of the Transit Centers will not significantly impact air quality in the vicinity of the Transit Center. Thus, the relevant approach and depart vehicle miles at the Transit Center were estimated to amount to the annual bus volume multiplied by 2 miles. Total annual idle times were estimated based on the annual bus volume and the assumption that each bus would idle for an average of 5 minutes at the Transit Centers. The resulting total annual approach and depart miles and the total annual idling times for the Transit Center are shown in Table 8.

The emission factors given in Table 7 combined with the estimated annual approach/depart miles and annual idle times shown in Table 8 will provide estimates of the total annual emissions attributable to the Transit Center. The resulting estimated annual emissions for the Waianae Coast Transit Center for the year 2003 are indicated in Table 9. Nitrogen oxides emissions at the Waianae Coast Transit Center is about 3 tons per year, while carbon monoxide emissions would amount to about 1.1 ton per year. Emissions of particulate, VOC and sulfur dioxide would be much less than 1 ton per year each. Emissions of nitrogen oxides and particulate can be expected to decrease with time as newer buses are phased in that must meet more stringent emission standards.

To ascertain the significance of the Transit Center emissions, the estimated annual emissions shown in Table 8 can be compared to the significant emission rates, which are defined in Hawaii Administrative Rules (HAR), Title 11, Chapter 60.1. Table 10 lists

the significant emission rates for nitrogen oxides, particulate, VOC, carbon monoxide and sulfur dioxide. A comparison of these two tables shows that the Transit Center emissions will be substantially less than the defined significant emission rates. Nitrogen oxides emissions at the Waianae Transit Center is about 7.5 percent of the significant emission rate, while all other emissions would amount to about 1 percent or less of the significant values.

2.4.2 Fugitive Dust Emissions During Construction

Although not a primary concern of this air quality assessment, short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction equipment traveling to and from the project sites, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [3] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project sites would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [4] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities will also likely obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

2.5 CONCLUSIONS AND RECOMMENDATIONS

2.5.1 Primary Impact of Long-term Emissions

The purpose of this air quality assessment is to evaluate the impact that increased bus emissions will have on air quality when the Transit Center is in operation. Based on the worst case scenario described in section 1.2.3, it is estimated that any long-term impacts on air quality near the proposed Transit Center due to emissions from project-related bus traffic will be negligible. Annual emissions from bus traffic at the Transit Center will amount to only a small fraction of the state-defined significant emission rates, and thus it can be anticipated that any direct impacts on air quality from bus emissions will be minimal. It is conceivable, however, that indirect impacts on air quality could occur if the normal flow of ambient traffic on adjacent roadways is disrupted by bus traffic, causing excess emissions to occur from other motor vehicle traffic. Thus, the proposed facilities should be designed so as minimize the disruption of traffic on adjacent roadways. Implementing other measures to mitigate long-term impacts is probably unnecessary and unwarranted.

2.5.2 Secondary Impact of Construction Activities

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of windscreens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment, roadway lane closures and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours and by trying to avoid roadway lane closures during peak traffic periods.

References

1. "Local Climatological Data, Annual Summary with Comparative Data, Honolulu, Hawaii, 1998", National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, NC.

2. U.S. Department of Commerce, Weather Bureau, "Climatography of the United States No. 86-44, Decennial Census of the United States Climate, Climatic Summary of the United States, Supplement for 1951 through 1960, Hawaii and Pacific", Washington, D.C., 1965.

3. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Research Triangle Park, NC, January 1995.

4. State of Hawaii. Hawaii Administrative Rules, Chapter 11-60, Air Pollution Control.

5. User's Guide to MOBILE6.1 and 6.2: Mobile Source Emission Factor Model, Draft, U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Mobile Sources, Emission Control Technology Division, Test and Evaluation Branch, Ann Arbor, Michigan, March 2002.

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ACRONYMS

AAQS	Ambient Air Quality Standards
AMP	AM Partners, Inc.
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DTS	Dept. of Transportation Services
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FONSI	Finding Of No Significant Impact
HAR	Hawaii Administrative Rules
HC	Hydrocarbons
HDDV	Heavy-duty Diesel Vehicle
HDOH	Hawaii Dept. of Health
LDGV	Light-duty Gasoline Vehicle
NO_x	Nitrogen Oxides
PM	Particulate Matter
TEC	The Environmental Company, Inc.
TC	Transit Center
TMK	Tax Map Key
VOC	Volatile Organic Compounds

Table 1 EPA Emission Standards for Heavy-duty Diesel Engines, g/bhp-hr.

Model Year 1987 – 2003 (Source: Dieselnet.com)

Heavy-Duty Diesel Truck Engines				
Year	HC	CO	NOx	PM
1988	1.3	15.5	10.7	0.6
1990	1.3	15.5	6	0.6
1991	1.3	15.5	5	0.25
1994	1.3	15.5	5	0.1
1998	1.3	15.5	4	0.1
Urban Bus Engines				
Year	HC	CO	NOx	PM
1991	1.3	15.5	5	0.25
1993	1.3	15.5	5	0.1
1994	1.3	15.5	5	0.07
1996	1.3	15.5	5	0.05*
1998	1.3	15.5	4	0.05*

* - in-use PM standard 0.07

Table 2 Summary of State of Hawaii and National Ambient Air Quality Standards

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	$\mu g/m^3$	Annual	50[a]	50[a]	50
		24 Hours	150[b]	150[b]	150[c]
Particulate Matter (<2.5 microns)	$\mu g/m^3$	Annual	15[a]	15[a]	-
		24 Hours	65[d]	65[d]	-
Sulfur Dioxide	$\mu g/m^3$	Annual	80	-	80
		24 Hours	365[c]	-	365[c]
		3 Hours	-	1300[c]	1300[c]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours	10[c]	-	5[c]
		1 Hour	40[c]	-	10[c]
Ozone	$\mu g/m^3$	8 Hours	157[e]	157[e]	-
		1 Hour	235[f]	235[f]	100[c]
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	$\mu g/m^3$	1 Hour	-	-	35[c]

[a] Three-year average of annual arithmetic mean.

[b] 99th percentile value averaged over three years.

[c] Not to be exceeded more than once per year.

[d] 98th percentile value averaged over three years.

[e] Three-year average of fourth-highest daily 8-hour maximum.

[f] Standard is attained when the expected number of exceedances is less than or equal to 1.

Note: Standards for particulate matter (<2.5 microns) and for 8-hour ozone are subject to court appeal.

Table 3 Annual Wind Frequency for Honolulu International Airport (%)

Wind Direction	Wind Speed (knots)									Total
	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	
N	0.5	2.5	1.3	0.5	0.0	0.0	0.0	0.0	0.0	4.8
NNE	0.3	1.2	1.6	1.5	0.2	0.0	0.0	0.0	0.0	4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3	0.0	0.0	0.0	23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3	0.0	0.0	0.0	34.7
E	0.1	1.0	2.5	2.8	0.5	0.0	0.0	0.0	0.0	7.0
ESE	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1
SE	0.0	0.3	0.8	1.0	0.1	0.0	0.0	0.0	0.0	2.2
SSE	0.1	0.4	1.2	0.7	0.1	0.0	0.0	0.0	0.0	2.4
S	0.1	0.5	1.4	0.6	0.1	0.0	0.0	0.0	0.0	2.7
SSW	0.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	1.5
SW	0.0	0.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	1.5
WSW	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	1.2
W	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1
WNW	0.2	1.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.0
NW	0.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	3.8
NNW	0.5	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	3.8
Calm	2.5									2.5
Total	5.4	18.3	30.6	36.5	8.5	0.7	0.0	0.0	0.0	100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 4 Air Pollution Emissions Inventory for the Island of Oahu, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	25,891	49,374	75,265
Sulfur Oxides	39,230	nil	39,230
Nitrogen Oxides	92,436	31,141	123,577
Carbon Monoxide	28,757	121,802	150,559
Hydrocarbons	4,160	421	4,581

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 5 Annual Summaries of Air Quality Measurements for Monitoring Stations Near Oahu Transit Center Project (Source: HDOH Annual Summaries, Hawaii Air Quality Data, 1996-2000)

Parameter / Location	1996	1997	1998	1999	2000
Sulfur Dioxide / Kapolei					
3-Hour Averaging Period:					
No. of Samples	2785	2845	2723	2710	2505
Highest Concentration ($\mu g/m^3$)	45	61	69	30	23
2nd Highest Concentration ($\mu g/m^3$)	42	52	64	17	18
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
No. of Samples	358	361	343	360	362
Highest Concentration ($\mu g/m^3$)	14	20	17	6	6
2nd Highest Concentration ($\mu g/m^3$)	11	16	16	6	5
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	2	2	2	2	1
Particulate (PM-10) / Kapolei					
24-Hour Averaging Period:					
No. of Samples	55	269	359	362	356
Highest Concentration ($\mu g/m^3$)	52	41	34	129	148
2nd Highest Concentration ($\mu g/m^3$)	29	26	34	39	129
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	19	13	15	15	17
Carbon Monoxide / Kapolei					
1-Hour Averaging Period:					
No. of Samples	8220	8649	8044	8395	8595
Highest Concentration (mg/m^3)	1.7	1.8	1.9	1.5	2.5
2nd Highest Concentration (mg/m^3)	1.6	1.7	1.5	1.2	1.6
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
No. of Samples	1049	1085	1044	1048	1076
Highest Concentration (mg/m^3)	0.7	0.7	0.6	0.6	1.0
2nd Highest Concentration (mg/m^3)	0.7	0.7	0.6	0.6	0.8
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration ($\mu g/m^3$)	2	8	8	7	9
Ozone / Sand Island					
1-Hour Averaging Period:					
No. of Samples	8263	8702	8688	8566	8482
Highest Concentration (mg/m^3)	92	106	114	110	98
2nd Highest Concentration (mg/m^3)	91	106	110	106	96
No. of State AAQS Exceedances	0	13	7	8	0

Table 6 Estimated Annual Bus Volumes for the Waianae Coast Transit Center

Transit Center	Route No.	Service Start Time	Service End Time	Hours/Day	Buses/Hour	Buses/Day	Buses/Year
Waianae	All	-	-	16	14	224	81,760
	All	-	-	8	4	32	11,680
				Total	93,440		

Notes:

1. Route numbers based on Draft Central Oahu Hub and Spoke Service Plan.
2. Service times based on Draft Central Oahu Hub and Spoke Plan and Current Public Timetables for existing service.
3. Buses per hour calculated based on planned service headways.
4. Weekend service assumed to be the same as weekday service.
5. Express routes not included.

Table 7 Emission Factors for Heavy-Duty Diesel Vehicles

Parameter	Composite Emission Factor (g/mile)	Idle Emission Factor (g/min)
Nitrogen Oxides	12.3	0.90
Particulate	0.411	0.017
Volatile Organic Compounds	0.733	0.080
Carbon Monoxide	3.72	0.64
Sulfur Dioxide	0.448	0.019

Notes:

1. Emission factors obtained from MOBILE6.1.
2. Emission factors pertain to calendar year 2003 and ambient temperature of 77°F.
3. Composite emission factors pertain to an average vehicle speed of 25 mph.
4. Idle emission factors based on 2.5 mph speed.
5. Particulate emission factors pertain to exhaust emissions only.

Table 8 Annual Approach/Depart Miles and Idle Times for the Proposed Transit Center Project

Transit Center	Annual Bus Volume	Annual Approach/Depart Miles	Annual Idle Time (minutes)
Waianae	93,440	186,880	467,200
Wahiawa	84,315	168,630	421,575
Mililani	78,475	156,950	392,375

Table 9 Estimated Annual Emissions for the Waianae Coast Transit Center Project

Transit Center	Parameter	Annual Approach/Depart Emissions (tons)	Annual Idle Emissions (tons)	Total Annual Emissions (tons)
Waianae	Nitrogen Oxides	2.5	0.46	3.0
	Particulate	0.085	0.0087	0.094
	VOC	0.15	0.041	0.19
	Carbon Monoxide	0.76	0.33	1.1
	Sulfur Dioxide	0.092	0.0098	0.10

Table 10 Significant Emission Rates

Parameter	Emission Rate (tons/year)
Nitrogen Oxides	40
Particulate	15
Volatile Organic Compounds	40
Carbon Monoxide	100
Sulfur Dioxide	40

Notes:

1. As defined in Hawaii Administrative Rules, Title 11, Chapter 60.1.
2. Particulate emission rate pertains to particles less than 10 microns aerodynamic diameter.

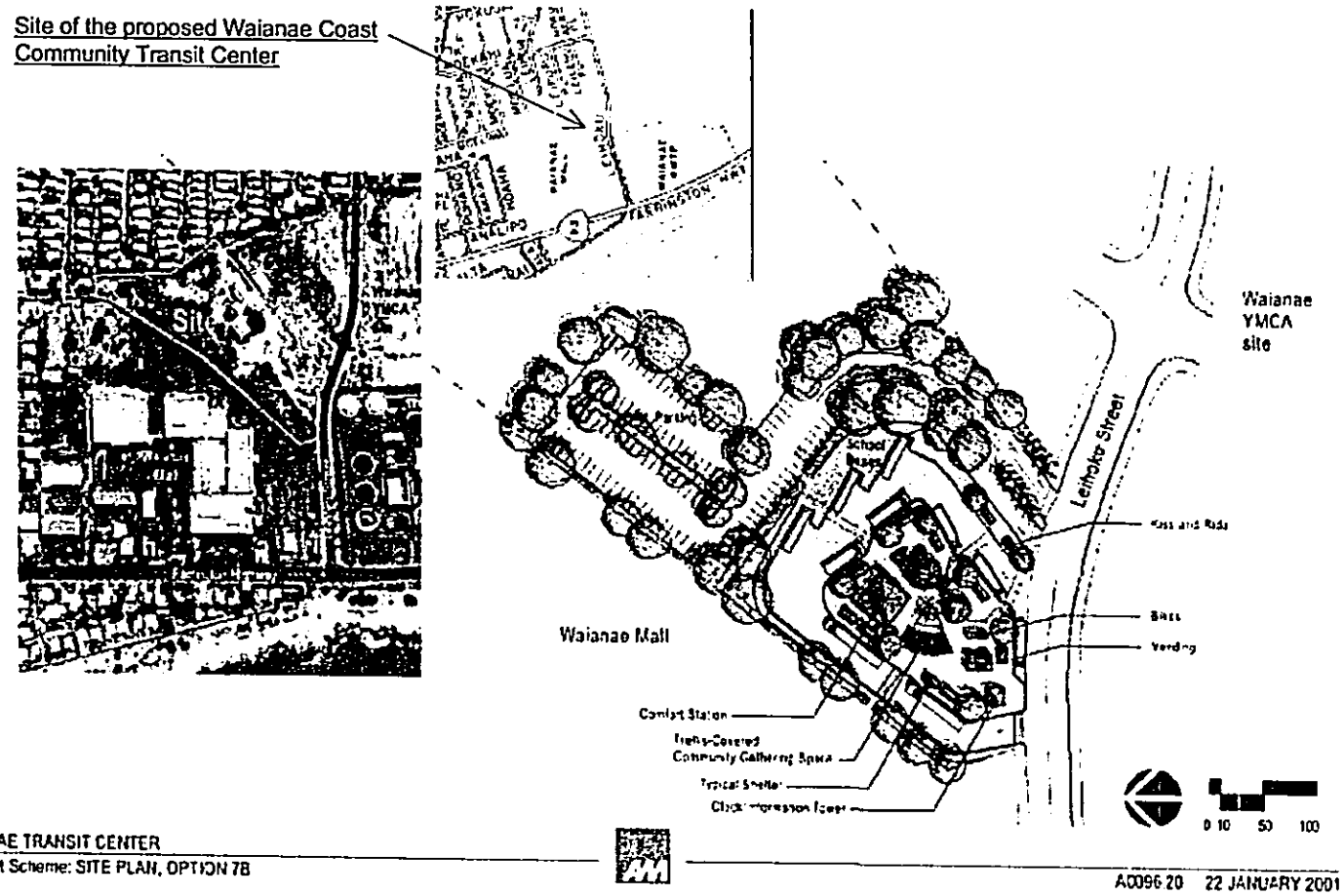


Figure 1.1 Site Map and Plan of the proposed Waianae Coast Community Transit Center.

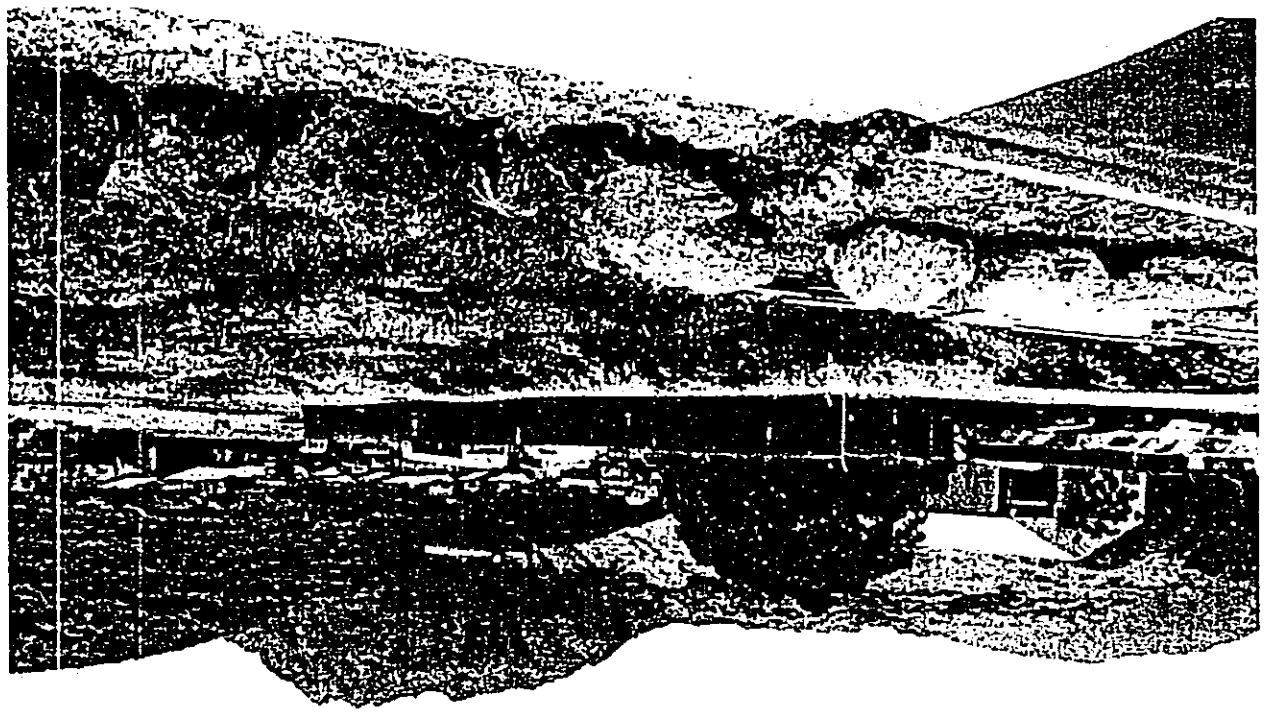


Figure 1.2 Site of the proposed Waianae Coast Community Transit Center.

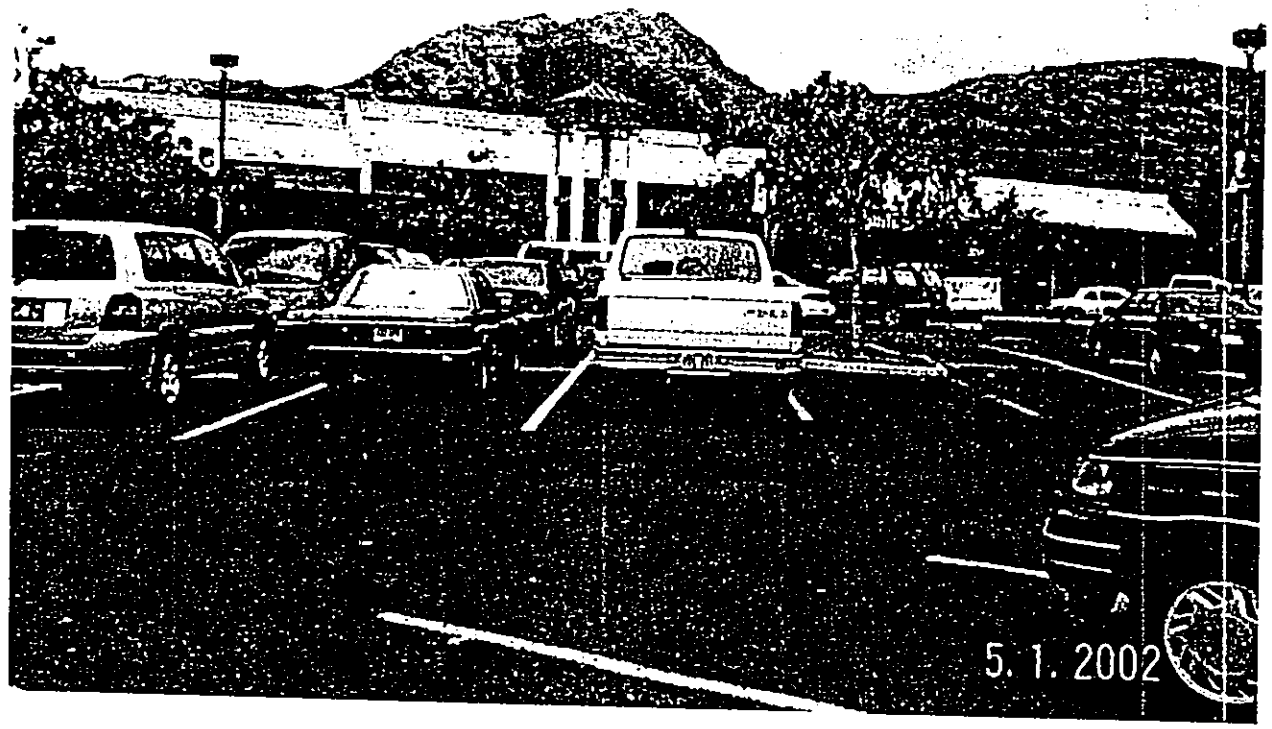


Figure 1.5 Waianae Mall adjacent to the proposed Waianae Coast Community Transit Center.

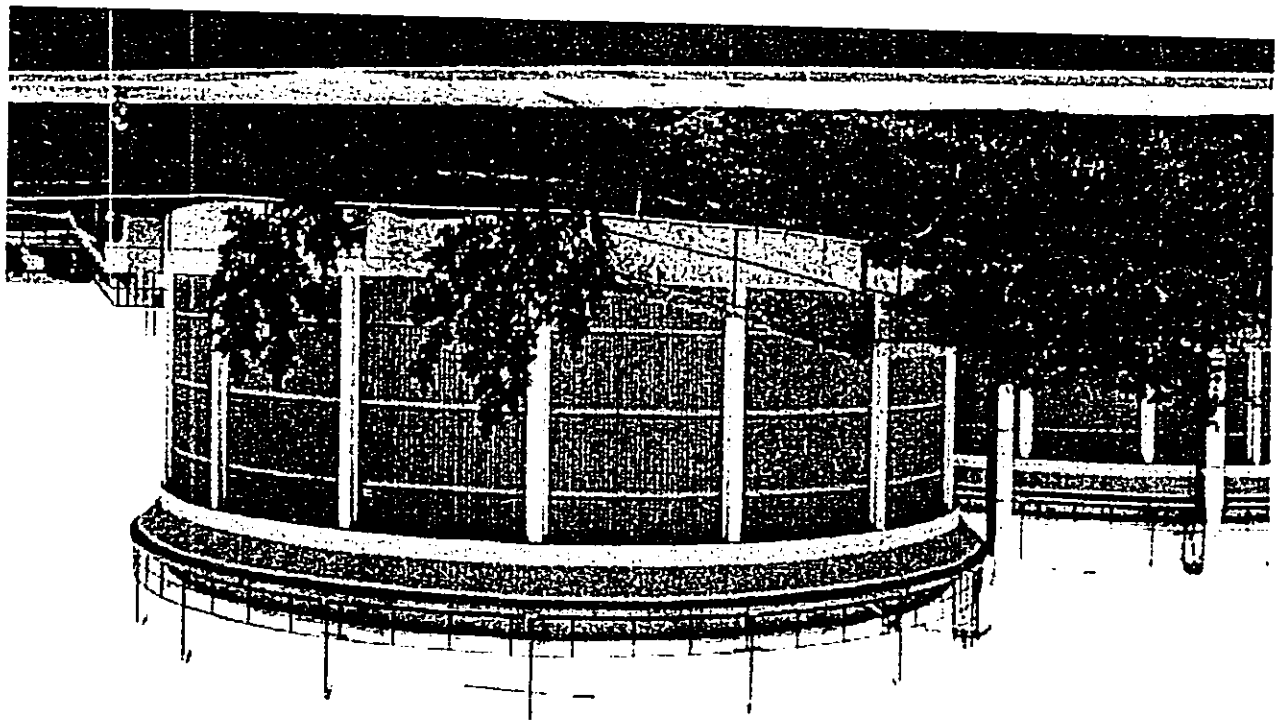


Figure 1.4 Waianae Waste Water Treatment Plant south of the proposed Waianae Coast Community Transit Center.

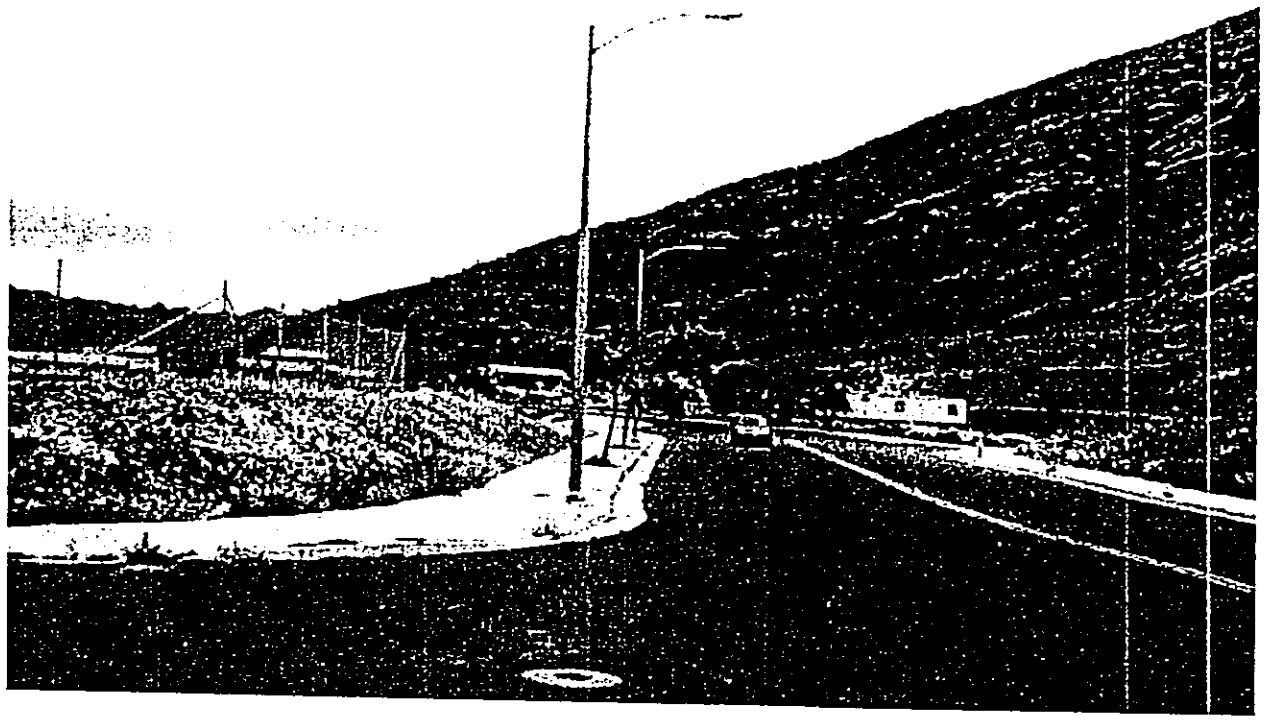
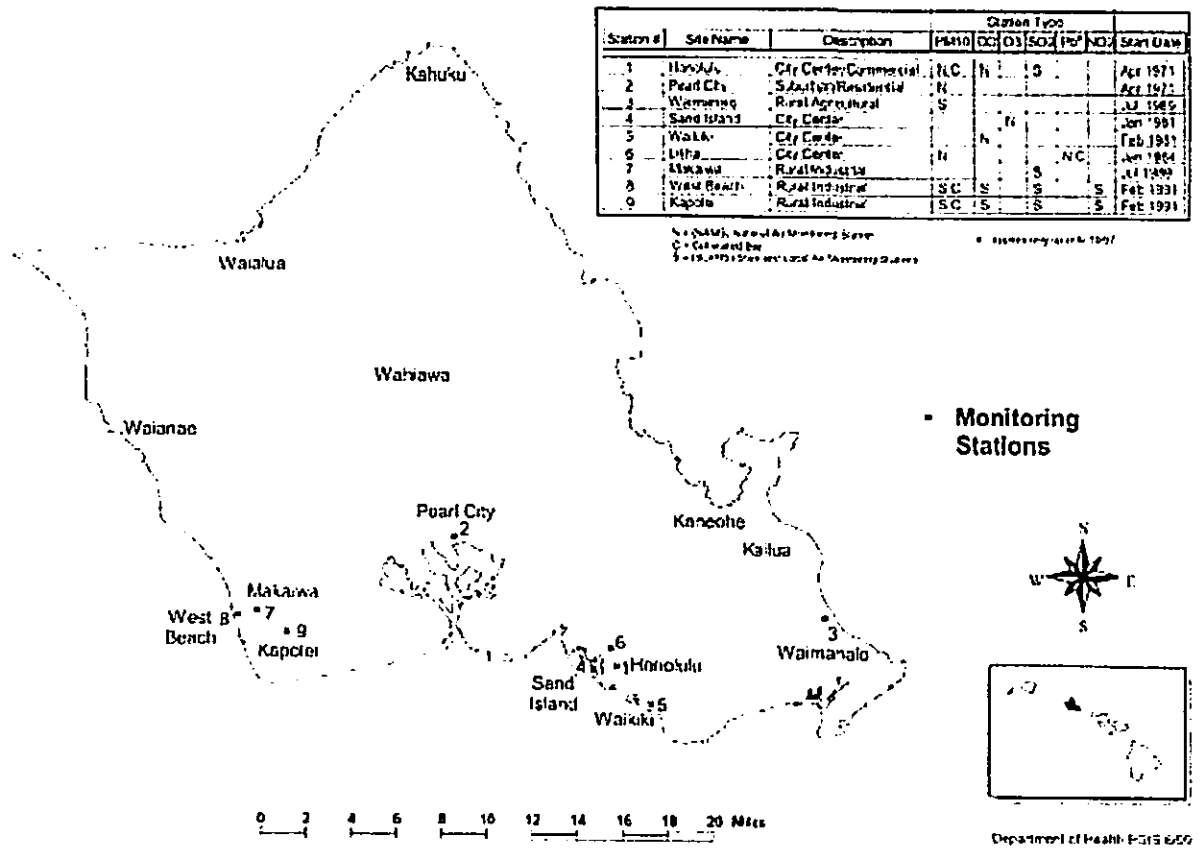


Figure 1.3 The Waianae YMCA east of the proposed Waianae Coast Community Transit Center.

Island of Oahu - Air Quality Monitoring Stations



Station #	Site Name	Description	Station Type PM10	CO	O3	SO2	Pb*	NO2	Start Date
1	Honolulu	City Center/Commercial	N,C	N		S			Apr 1971
2	Pearl City	Suburban/Residential	N						Apr 1971
3	Waimanalo	Rural Agricultural	S						Jul 1985
4	Sand Island	City Center			N				Jan 1981
5	Waikiki	City Center		N					Feb 1981
6	Liliha	City Center	N					N,C	Jan 1984
7	Makaha	Rural/Suburban				S			Jul 1999
8	West Beach	Rural Industrial	S,C	S		S		S	Feb 1981
9	Kapolei	Rural Industrial	S,C	S		S		S	Feb 1981

Figure 1.6 Air quality Monitoring Stations on the island of Oahu, Hawaii

AIR QUALITY STUDY

FOR THE PROPOSED

OAHU TRANSIT CENTERS PROJECT

OAHU, HAWAII

Prepared for:

The Environmental Company, Inc.

May 2002

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1.0 SUMMARY

The Honolulu City & County Department of Transportation Serivces is proposing to develop the Oahu Transit Centers Project at three locations in West and Central Oahu. The three locations include Waianae, Wahiawa and Mililani. The proposed project will consist of seven to ten bus bays at each location along with passenger waiting facilities and other ancillary facilities. Development of the project is expected to be completed during 2003. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate.

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are more stringent than the comparable national standards except for those pertaining to sulfur dioxide and particulate matter.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. Winds at each location are predominantly trade winds, but they are likely often deviated by the local terrain. During winter, occasional storms may generate strong winds from the south (kona winds) for brief periods. When the trade winds or kona winds are weak or absent, landbreeze-seabreeze circulations or mountain drainage winds may develop. Wind speeds are often lower compared to more exposed coastal locations, but the trade

winds still provide relatively good ventilation much of the time. Temperatures in the Oahu area leeward of the Koolaus are generally very moderate with average daily temperatures ranging from about 70?F to 85?F. Extreme temperatures range from about 53?F to about 95?F. Rainfall in the Waianae area is relatively low with an average of about 20 inches per year, while the Wahiawa and Mililani areas receive about 50 inches per year.

The present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standard for ozone may occur. It is also probable that the more stringent state standards for carbon monoxide are exceeded at times near congested roadway intersections.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of

active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, buses coming to and from the proposed transit centers will result in a long-term increase in air pollution emissions in the project area. To assess the potential impact of these emissions, estimates of project-related annual emissions were prepared. These were then compared to the significant emission rates defined in the Hawaii Administrative Rules. This comparison showed that the bus emissions at the transit centers will be relatively small compared to the significant emission rates. Therefore, as long as the transit center operations do not disrupt traffic on nearby roadways, it is unlikely that any measurable impacts on air quality will occur. Implementing any air quality mitigation measures for long-term impacts from the proposed project is probably unnecessary and unwarranted.

2.0 INTRODUCTION

The Honolulu City & County Department of Transportation Services is proposing to develop the Oahu Transit Centers Project at three locations on the island of Oahu. These consist of the Waianae

Coast Community Transit Center, the Wahiawa Community Transit Center and the Mililani Community Transit Center. Figure 1 indicates the locations of the three proposed transit centers.

The proposed Waianae Coast Community Transit Center will be located at 86-052 Leihoku Street, on a portion of TMK 8-6-1:29 adjacent to the Waianae Mall and across the street from the site of the Waianae YMCA. This facility will provide seven bays for TheBus and paratransit vehicles, arranged around a central "island" that will accommodate passenger waiting shelters, a comfort station with restrooms, vending and information kiosks, landscaping, bike parking/lockers, and a "gathering place" feature. The facility will also provide three bays for private school buses, a passenger drop-off/pick-up area, and parking for approximately 100 vehicles.

The proposed Wahiawa Community Transit Center will be located in Wahiawa's Civic Center at 956 California Avenue, on portions of TMK 7-4-6:2 and TMK 7-4-6:12. This facility will provide eight bays for TheBus and paratransit vehicles, four of which will be located off-street while the other four will be located along California Avenue. Passenger waiting shelters, a comfort station with restrooms, bike parking/lockers, and informational kiosks will be provided, along with landscaping and additional street trees.

The proposed Mililani Community Transit Center will located along Meheula Parkway fronting Mililani Town Center, and will use air rights over a portion of the shopping center's parking lot and landscape strip. The Center will provide ten bays for TheBus and paratransit vehicles, passenger waiting shelters, a comfort

station, informational kiosks, bike parking/lockers, and landscaping. An elevator and open stairways will provide links from the Transit Center to the shopping center parking level. A proposal has also been made to provide community meeting space at the lower level.

Development of all three transit centers is expected to be completed during 2003.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short-term and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities. Measures to mitigate these impacts are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with

an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit, and the state 1-hour limit for ozone is more than two times as stringent as the national 1-hour standard. The national 1-hour ozone standard will be phased out (pending court appeal) the next few years in favor of the new (and more stringent) 8-hour standard.

The Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. During 1997, the federal government again revised its standards for particulate, but the new standards have been challenged in federal court. To date, the Hawaii Department of Health has not updated the state particulate standards.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state and most of the year, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. Waianae, Wahiawa and Mililani, the sites of the proposed project, are suburban areas within the City and County of Honolulu. Waianae is located leeward of the Waianae Range, while Wahiawa and Mililani are situated between the Koolau and Waianae Ranges. Although climatic conditions vary somewhat

across the project area, long-term weather data available from the Honolulu International Airport, located a few miles to the southeast, is at least semi-representative.

Wind frequency data given in Table 2 for Honolulu International Airport show that the annual prevailing wind direction for this area of Oahu is east northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and nearly 75 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent occurring only a few days during the year and mostly in association with winter storms. Wind speeds average about 11 mph (10 knots) and mostly vary between about 4 and 18 mph (5 and 15 knots). Surface wind speeds in the project area are somewhat lighter, particularly at the Waianae site, and local wind directions likely are affected by the terrain.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade wind tend to have the least temperature variation, while inland and leeward areas often have the most. The project area's leeward location results in a relatively moderate temperature profile compared to some other locations around Oahu and the state. At the airport, average annual daily minimum and maximum temperatures are 70?F and 84?F, respectively

[1]. The extreme minimum temperature was 53?F during January 1998, and the extreme maximum was 95?F during September 1994. Temperatures in the Waianae area may be slightly higher compared to the airport due to wind-sheltering effects, while the Wahiawa and Mililani areas are probably slightly cooler due to the higher elevation.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is often measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In suburban areas, like those in the project area, stability class 5 or 6 is generally the highest stability class that occurs, developing during the nighttime and early morning.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer

land. Mixing heights in the state typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial effect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water-soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Waianae area is one of the drier areas on Oahu due to its leeward and near sea level location. Average annual rainfall amounts to about 20 inches [2]. Wahiawa and Mililani, located at a higher elevation and between the Koolau and Waianae Ranges, have a wetter climate receiving about 50 inches per year [2].

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, industrial sources, agricultural operations and to a lesser extent by natural sources. Table 3 presents an air pollutant emission summary for the island of Oahu for calendar year 1993. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Oahu originate from area sources, such as the mineral products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxides emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources. Based on previous emission inventories that

have been reported for Oahu, it appears that emissions of particulate and nitrogen oxides have increased during the past ten years, while emissions of sulfur oxides, carbon monoxide and hydrocarbons have declined.

Roadways in the vicinity of the three proposed transit center sites carry moderate volumes of motor vehicle traffic at times, and roadway intersections may be congested during peak traffic hours. Emissions from motor vehicles using these roadways, primarily nitrogen oxides and carbon monoxide, may cause localized impacts on air quality.

At the Waianae site, the nearest industrial source of air pollution is the Waianae Wastewater Treatment Plant, which is located a few hundred feet to the south. Wastewater treatment plants emit hydrogen sulfide, which can cause odor nuisance even at very low concentrations. Kahe Power Plant is situated about 7 miles to the southeast, and adjacent to this is the Waimanalo Gulch Sanitary Landfill. Campbell Industrial Park is located about 12 miles to the southeast. Emissions from these facilities consist primarily of sulfur dioxide, nitrogen oxides and particulate. Due to the prevailing wind pattern in the area, it is unlikely that emissions from these sources cause any chronic impacts on air quality in the Waianae area, but occasional impacts may occur with south winds.

The Wahiawa and Mililani sites are farther removed from large industrial sources of air pollution, although emissions from distant sources at Campbell Industrial Park may affect these areas during kona wind conditions.

With the demise of sugarcane growing on the Ewa Plain, air pollutions impacts from agriculture have significantly diminished in the area. Agriculture-related emissions in the Waianae area consist mostly of particulate matter from small-scale operations, while the Wahiawa and Mililani areas may experience occasional dust and smoke impacts from nearby, large-scale pineapple cultivation and harvesting operations.

Natural sources of air pollution emissions that also could affect the project area but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of Hawaii.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station, however, typically does not monitor the full complement of air quality parameters. Table 4 shows annual summaries of air quality measurements that were made nearest to the project area for several of the regulated air pollutants for the period 1996 through 2000. These are the most recent data that are currently available.

During the 1996-2000 period, sulfur dioxide was monitored by the State Department of Health at an air quality station located at Kapolei. Concentrations monitored were consistently low compared to the standards. Annual second-highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 17 to 64 ?g/m^3, while the annual second-highest 24-hour concentrations ranged from 5 to 16 ?g/m^3. Annual average

concentrations were only about 1 to 2 ?g/m^3. There were no exceedances of the state/national 3-hour or 24-hour AAQS for sulfur dioxide during the 5-year period.

Particulate matter less than 10 microns in diameter (PM-10) is also measured at the Kapolei monitoring station. Annual second-highest 24-hour PM-10 concentrations ranged from 26 to 129 ?g/m^3 between 1996 and 2000. Average annual concentrations ranged from 13 to 19 ?g/m^3. All values reported were within the state and national AAQS.

Carbon monoxide measurements were also made at the Kapolei monitoring station. The annual second-highest 1-hour concentrations ranged from 1.2 to 1.7 mg/m^3. The annual second-highest 8-hour concentrations ranged from 0.6 to 0.8 mg/m^3. No exceedances of the state or national 1-hour or 8-hour AAQS were reported.

Nitrogen dioxide is also monitored by the Department of Health at the Kapolei monitoring station. Annual average concentrations of this pollutant ranged from 2 to 9 ?g/m^3, safely inside the state and national AAQS.

The nearest available ozone measurements were obtained at Sand Island (about 15 to 25 miles southeast of the project area). The second-highest 1-hour concentrations for each year from 1996 to 2000 ranged from 91 to 110 ?g/m^3. Up to 13 exceedances of the state AAQS per year were recorded during the monitoring period. No specific trend is discernable, although the number of

exceedances was lower during the latter half of the five-year period.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued during 1997.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide, particulate matter and lead are currently being met at the project site. It is likely, however, that the state AAQS for ozone may be exceeded on occasion based on the Sand Island measurements for this parameter. While carbon monoxide measurements at the Kapolei monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections.

6.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction

equipment traveling to and from the project sites, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [3] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the three project sites would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [4] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further

stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities will also likely obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

After construction is completed, use of the proposed facilities will result in increased bus traffic on nearby roadways, potentially causing long-term impacts on ambient air quality in the vicinity of each of the three transit centers where the buses will congregate. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide, and they also emit nitrogen oxides and other contaminates. In urban and suburban areas, carbon monoxide emissions near congested roadway intersections are the usual issue. In the case of diesel-powered buses, however, the primary air pollution emissions consist of nitrogen oxides and particulate matter; carbon monoxide emissions are generally inconsequential compared to automobile emissions.

Although computer models can generally be used to assess the impacts of carbon monoxide emissions from motor vehicle traffic, it is probably impractical to attempt to quantitatively model the bus emissions of nitrogen oxides and particulate that may be associated with the proposed facilities. In lieu of this, annual emissions from project bus operations in the vicinity of each of the proposed transit centers were estimated and compared to the "significant" emission rates as defined in the Hawaii Administrative Rules. Strictly speaking, the significant emission rates are intended to be applied to stationary point sources and not mobile sources such as bus traffic. Nevertheless, it is believed that this will provide a reasonable approach to ascertaining the significance of the project-related emissions of nitrogen oxides and particulate. If the project emissions are shown to be below the significant emissions rates,

this is usually taken to indicated that a more detailed assessment of the emissions is not warranted.

To begin the evaluation of the potential long-term impacts on air quality related to the proposed facilities, the annual bus volumes at each of the three transit centers were estimated. These were estimated by first identifying the bus routes that would include each transit center and then reviewing the schedules for these routes to enumerate the buses each day that would be associated with each route at the transit centers. Table 5 shows the resulting estimated annual bus volume at each facility and the basis for these estimates. As indicated in the table, the expected total annual bus volumes at each transit center are 93,440 at Waianae, 84,315 at Wahiawa and 78,475 at Mililani. As noted in the table, these estimates assume that weekend service will be the same as weekday service. Actual annual bus volumes will be somewhat lower due to reduced service on weekends and holidays.

Buses using the proposed transit centers will emit air pollution on approach, during idle and as they depart. To estimate the bus emissions during these modes of operation, the EPA computer model MOBILE6.1 [5] was used in combination with the expected annual bus volumes. MOBILE6.1 can be used to provide composite emission factors for a given year, vehicle class, average vehicle speed and ambient air temperature. The composite emission factors generally pertain to various modes of operation (acceleration, cruise, deceleration and idle) and are specified in terms of grams per vehicle mile of travel. Idle emission rates in terms of grams per minute can be estimated separately. For this project, MOBILE6.1 was used to estimate emission factors for the heavy-duty diesel vehicle (HDDV) class. Emission factors for nitrogen oxides,

particulate, volatile organic compounds (VOC), carbon monoxide and sulfur dioxide were calculated for the year 2003, the expected year of project completion. Due to new emission standards for this class of vehicle that will be phased in during the next several years, emissions of nitrogen oxides and particulate will diminish in later years. An average annual temperature of 77°F was assumed, and it was further assumed that the average approach and departure speeds would be 25 mph.

Table 6 shows the resulting estimated composite and idle emission factors for HDDV. Nitrogen oxides emissions are the most appreciable followed by carbon monoxide, volatile organic compounds, sulfur dioxide and particulate. It is worth noting that carbon monoxide emissions from light-duty gasoline vehicles (LDGV) are about five times higher per vehicle mile of travel than are those for HDDV.

The next task is to determine the total vehicle miles and bus idle times associated with each transit center. A reasonable but somewhat arbitrary assumption is that emissions that occur beyond 1 mile of the transit centers will not significantly impact air quality in the vicinity of the transit centers. Thus, the relevant approach and depart vehicle miles at each facility were estimated to amount to the annual bus volume multiplied by 2 miles. Total annual idle times were estimated based on the annual bus volume and the assumption that each bus would idle for an average of 5 minutes at the transit centers. The resulting total annual approach and depart miles and the total annual idling times for each transit center are shown in Table 7.

The emission factors given in Table 6 combined with the estimated annual approach/depart miles and annual idle times shown in Table 7 will provide estimates of the total annual emissions attributable to each transit center. The resulting estimated annual emissions for each facility for the year 2003 are indicated in Table 8. Nitrogen oxides emissions would amount to less than 3 tons per year at each transit center, while carbon monoxide emissions would amount to about 1 ton per year at each location. Emissions of particulate, VOC and sulfur dioxide would be much less than 1 ton per year each. Emissions of nitrogen oxides and particulate can be expected to decrease with time as newer buses are phased in that must meet more stringent emission standards.

To ascertain the significance of the transit center emissions, the estimated annual emissions shown in Table 8 can be compared to the significant emission rates, which are defined in Hawaii Administrative Rules (HAR), Title 11, Chapter 60.1. Table 9 lists the significant emission rates for nitrogen oxides, particulate, VOC, carbon monoxide and sulfur dioxide. A comparison of these two tables shows that the transit center emissions will be substantially less than the defined significant emission rates. Nitrogen oxides emissions at each location would amount to about 8 percent of the significant emission rate, while all other emissions would amount to about 1 percent or less of the significant values.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities

are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of windscreens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment, roadway lane closures and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours and by trying to avoid roadway lane closures during peak traffic periods.

After the proposed project is completed, any long-term impacts on air quality near the three proposed transit centers due to

emissions from project-related bus traffic will be negligible. Annual emissions from bus traffic at each transit center will amount to only a small fraction of the state-defined significant emission rates, and thus it can be anticipated that any direct impacts on air quality from bus emissions will be minimal. It is conceivable, however, that indirect impacts on air quality could occur if the normal flow of ambient traffic on adjacent roadways is disrupted by bus traffic, causing excess emissions to occur from other motor vehicle traffic. Thus, the proposed facilities should be designed so as minimize the disruption of traffic on adjacent roadways. Implementing other measures to mitigate long-term impacts is probably unnecessary and unwarranted.

REFERENCES

1. "Local Climatological Data, Annual Summary with Comparative Data, Honolulu, Hawaii, 1998", National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, NC.

2. U.S. Department of Commerce, Weather Bureau, "Climatography of the United States No. 86-44, Decennial Census of the United States Climate, Climatic Summary of the United States, Supplement for 1951 through 1960, Hawaii and Pacific", Washington, D.C., 1965.

3. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Research Triangle Park, NC, January 1995.

4. State of Hawaii. Hawaii Administrative Rules, Chapter 11-60, Air Pollution Control.

5. User's Guide to MOBILE6.1 and 6.2: Mobile Source Emission Factor Model, Draft, U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Mobile Sources, Emission Control Technology Division, Test and Evaluation Branch, Ann Arbor, Michigan, March 2002.

Figure 1 - Project Location Map

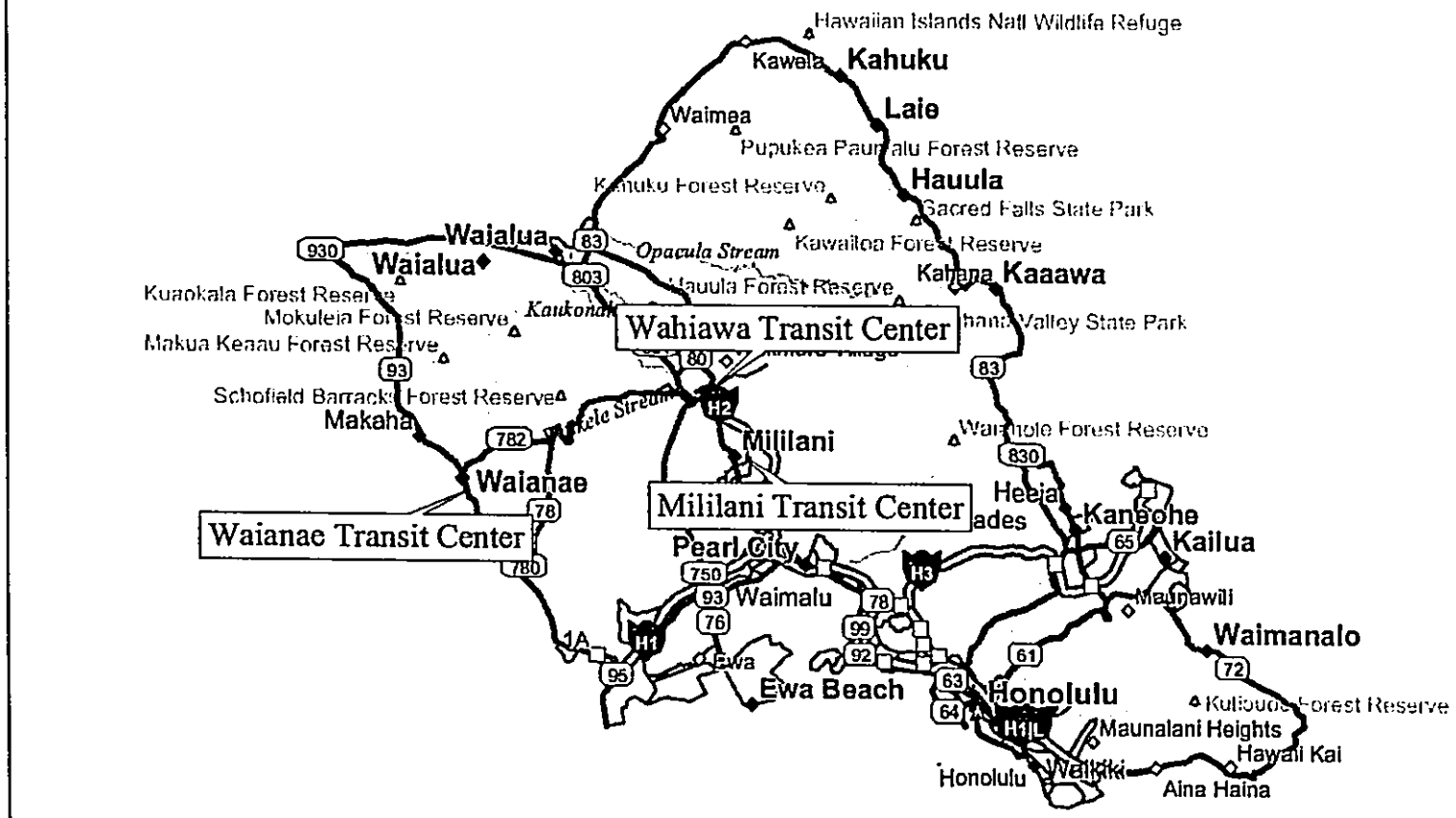


Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL
AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	?g/m³	Annual 24 Hours	50[a] 150[b]	50[a] 150[b]	50 150[c]
Particulate Matter (<2.5 microns)	?g/m³	Annual 24 Hours	15[a] 65[d]	15[a] 65[d]	- -
Sulfur Dioxide	?g/m³	Annual 24 Hours 3 Hours	80 365[c] -	- - 1300[c]	80 365[c] 1300[c]
Nitrogen Dioxide	?g/m³	Annual	100	100	70
Carbon Monoxide	mg/m³	8 Hours 1 Hour	10[c] 40[c]	- -	5[c] 10[c]
Ozone	?g/m³	8 Hours 1 Hour	157[e] 235[f]	157[e] 235[f]	- 100[c]
Lead	?g/m³	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	?g/m³	1 Hour	-	-	35[c]

[a] Three-year average of annual arithmetic mean.

[b] 99th percentile value averaged over three years.

[c] Not to be exceeded more than once per year.

[d] 98th percentile value averaged over three years.

[e] Three-year average of fourth-highest daily 8-hour maximum.

[f] Standard is attained when the expected number of exceedances is less than or equal to 1.

Note: Standards for particulate matter (<2.5 microns) and for 8-hour ozone are subject to court appeal.

Table 2

ANNUAL WIND FREQUENCY FOR HONOLULU INTERNATIONAL AIRPORT (%)

Wind Direction	Wind Speed (knots)									Total
	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	
N	0.5	2.5	1.3	0.5	0.0	0.0	0.0	0.0	0.0	4.8
NNE	0.3	1.2	1.6	1.5	0.2	0.0	0.0	0.0	0.0	4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3	0.0	0.0	0.0	23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3	0.0	0.0	0.0	34.7
E	0.1	1.0	2.5	2.8	0.5	0.0	0.0	0.0	0.0	7.0
ESE	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1
SE	0.0	0.3	0.8	1.0	0.1	0.0	0.0	0.0	0.0	2.2
SSE	0.1	0.4	1.2	0.7	0.1	0.0	0.0	0.0	0.0	2.4
S	0.1	0.5	1.4	0.6	0.1	0.0	0.0	0.0	0.0	2.7
SSW	0.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	1.5
SW	0.0	0.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	1.5
WSW	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	1.2
W	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1
WNW	0.2	1.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.0
NW	0.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	3.8
NNW	0.5	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	3.8
Calm	2.5									2.5
Total	5.4	18.3	30.6	36.5	8.5	0.7	0.0	0.0	0.0	100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR
ISLAND OF OAHU, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	25,891	49,374	75,265
Sulfur Oxides	39,230	nil	39,230
Nitrogen Oxides	92,436	31,141	123,577
Carbon Monoxide	28,757	121,802	150,559
Hydrocarbons	4,160	421	4,581

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 4

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST OAHU TRANSIT CENTERS PROJECT

Parameter / Location	1996	1997	1998	1999	2000
Sulfur Dioxide / Kapolei					
3-Hour Averaging Period:					
No. of Samples	2785	2845	2723	2710	2505
Highest Concentration (?g/m³)	45	61	69	30	23
2nd Highest Concentration (?g/m³)	42	52	64	17	18
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
No. of Samples	358	361	343	360	362
Highest Concentration (?g/m³)	14	20	17	6	6
2nd Highest Concentration (?g/m³)	11	16	16	6	5
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration (?g/m³)	2	2	2	2	1
Particulate (PM-10) / Kapolei					
24-Hour Averaging Period:					
No. of Samples	55	269	359	362	356
Highest Concentration (?g/m³)	52	41	34	129	148
2nd Highest Concentration (?g/m³)	29	26	34	39	129
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration (?g/m³)	19	13	15	15	17
Carbon Monoxide / Kapolei					
1-Hour Averaging Period:					
No. of Samples	8220	8649	8044	8395	8595
Highest Concentration (mg/m³)	1.7	1.8	1.9	1.5	2.5
2nd Highest Concentration (mg/m³)	1.6	1.7	1.5	1.2	1.6
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
No. of Samples	1049	1085	1044	1048	1076
Highest Concentration (mg/m³)	0.7	0.7	0.6	0.6	1.0
2nd Highest Concentration (mg/m³)	0.7	0.7	0.6	0.6	0.8
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration (?g/m³)	2	8	8	7	9
Ozone / Sand Island					
1-Hour Averaging Period:					
No. of Samples	8263	8702	8688	8566	8482
Highest Concentration (mg/m³)	92	106	114	110	98
2nd Highest Concentration (mg/m³)	91	106	110	106	96
No. of State AAQS Exceedances	0	13	7	8	0

Source: State of Hawaii Department of Health, "Annual Summaries, Hawaii Air Quality Data, 1996 - 2000"

Table 5

ESTIMATED ANNUAL BUS VOLUMES FOR
OAHU TRANSIT CENTERS PROJECT

Transit Center	Route No.	Service Start Time	Service End Time	Hours/Day	Buses/Hour	Buses/Day	Buses/Year
Waianae	All	-	-	16	14	224	81,760
	All	-	-	8	4	32	11,680
						Total	93,440
Wahiawa	511	5:00	22:00	17.0	2	34	12,410
	512	7:00	19:00	12.0	1	12	4,380
	513	6:00	19:00	13.0	1	13	4,745
	514	5:00	0:00	19.0	1	19	6,935
	E	7:30	22:00	14.5	2	29	10,585
	50	6:00	22:00	16.0	2	32	11,680
	51	9:00	18:00	9.0	2	18	6,570
	52	5:10	22:00	17.0	2	34	12,410
	62	4:40	0:35	20.0	2	40	14,600
						Total	84,315
Mililani	501	5:00	21:30	16.5	2	33	12,045
	502	5:00	19:30	14.5	1	14	5,110
	503	5:00	19:30	14.5	1	15	5,475
	E	7:30	22:00	14.5	2	29	10,585
	50	6:00	22:00	16.0	2	32	11,680
	51	9:00	18:00	9.0	2	18	6,570
	52	5:10	22:00	17.0	2	34	12,410
	62	4:40	0:35	20.0	2	40	14,600
						Total	78,475

Notes:

1. Route numbers based on Draft Central Oahu Hub and Spoke Service Plan.
2. Service times based on Draft Central Oahu Hub and Spoke Plan and Current Public Timetables for existing service.
3. Buses per hour calculated based on planned service headways.
4. Weekend service assumed to be the same as weekday service.
5. Express routes not included.

Table 6

EMISSION FACTORS FOR
HEAVY-DUTY DIESEL VEHICLES

Parameter	Composite Emission Factor (g/mile)	Idle Emission Factor (g/min)
Nitrogen Oxides	12.3	0.90
Particulate	0.411	0.017
Volatile Organic Compounds	0.733	0.080
Carbon Monoxide	3.72	0.64
Sulfur Dioxide	0.448	0.019

Notes:

1. Emission factors obtained from MOBILE6.1.
2. Emission factors pertain to calendar year 2003 and ambient temperature of 77°F.
3. Composite emission factors pertain to an average vehicle speed of 25 mph.
4. Idle emission factors based on 2.5 mph speed.
5. Particulate emission factors pertain to exhaust emissions only.

Table 7

ANNUAL APPROACH/DEPART MILES AND IDLE TIMES FOR
OAHU TRANSIT CENTERS PROJECT

Transit Center	Annual Bus Volume	Annual Approach/Depart Miles	Annual Idle Time (minutes)
Waianae	93,440	186,880	467,200
Wahiawa	84,315	168,630	421,575
Mililani	78,475	156,950	392,375

Table 8

ESTIMATED ANNUAL EMISSIONS FOR OAHU TRANSIT CENTERS PROJECT

Transit Center	Parameter	Annual Approach/Depart Emissions (tons)	Annual Idle Emissions (tons)	Total Annual Emissions (tons)
Waianae	Nitrogen Oxides	2.5	0.46	3.0
	Particulate	0.085	0.0087	0.094
	VOC	0.15	0.041	0.19
	Carbon Monoxide	0.76	0.33	1.1
	Sulfur Dioxide	0.092	0.0098	0.10
Wahiawa	Nitrogen Oxides	2.3	0.42	2.7
	Particulate	0.076	0.0079	0.084
	VOC	0.14	0.037	0.18
	Carbon Monoxide	0.69	0.30	0.99
	Sulfur Dioxide	O.083	0.0088	0.092
Mililani	Nitrogen Oxides	2.1	0.39	2.5
	Particulate	0.071	0.0074	0.078
	VOC	0.13	0.034	0.16
	Carbon Monoxide	0.64	0.28	0.92
	Sulfur Dioxide	O.077	0.0082	0.085

Table 9

SIGNIFICANT EMISSION RATES

Parameter	Emission Rate (tons/year)
Nitrogen Oxides	40
Particulate	15
Volatile Organic Compounds	40
Carbon Monoxide	100
Sulfur Dioxide	40

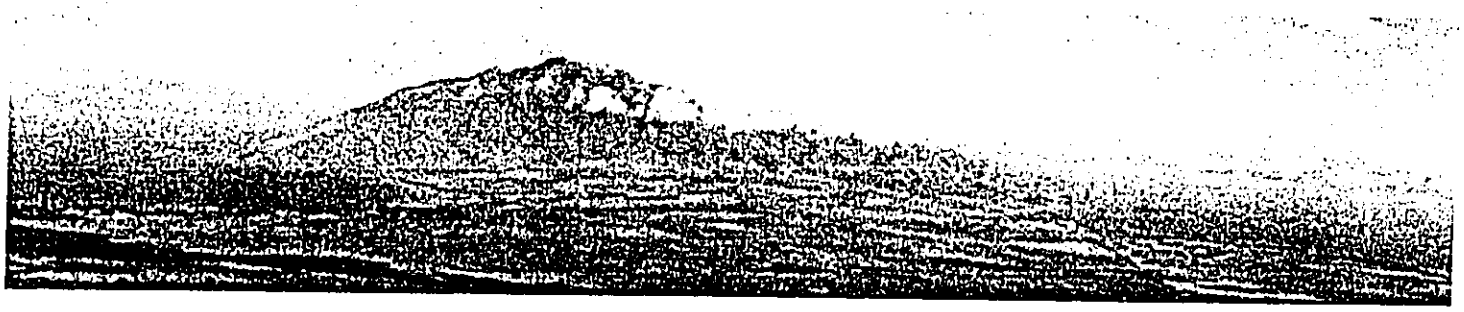
Notes:

1. As defined in Hawaii Administrative Rules, Title 11, Chapter 60.1.
2. Particulate emission rate pertains to particles less than 10 microns aerodynamic diameter.

State of Hawaii

Department of Health
Clean Air Branch
Honolulu, Hawaii

Annual Summary
Hawaii Air Quality Data



2000

2000
HAWAII AIR QUALITY DATA

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Section 1
INTRODUCTION

The Department of Health has been monitoring ambient air quality in the State of Hawaii since 1957. Until 1971, there was only one air monitoring site, which was located on the island of Oahu. The air monitoring network today has expanded to include 17 monitoring stations on Oahu, Kauai, Maui and Hawaii. The primary purpose of the statewide monitoring network is to measure ambient air concentrations of the six criteria pollutants that the United States Environmental Protection Agency (EPA) has promulgated National Ambient Air Quality Standards (NAAQS). The six criteria pollutants with NAAQS are: carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone and particulate matter less than or equal to 10 micrometers (PM_{10}). The State of Hawaii also has standards for ozone, carbon monoxide and nitrogen dioxide more stringent than the NAAQS and an ambient air standard for hydrogen sulfide.

Ambient air monitoring for lead was discontinued in October 1997 with EPA approval. Since sampling for lead began, levels in the state have been far below the federal standard, and with the elimination of lead in gasoline, measured levels were consistently zero or nearly zero.

Most commercial, industrial and transportation activities and their associated air quality effects occur on Oahu where nine of the stations are located. Agricultural operations produce the greatest air quality impacts on Maui and Kauai. Impacts on ambient air quality from the ongoing eruption of the Kilauea Volcano and from activities associated with geothermal energy production are being monitored on the island of Hawaii. Current plans call for the continuation of sampling at these sites, however, relocations, additions and/or discontinuations can occur in the future as the need arises.

This report summarizes the air pollutant data collected at the 17 monitoring stations during calendar year 2000. Tabular and graphic summaries are provided which compare the measured concentrations with State and Federal ambient air quality standards. In addition, air pollutant concentration trend summaries are depicted in graphic form.

Various other data may be summarized as the need arises. Questions regarding these data and other air quality data should be addressed to:

State of Hawaii
Department of Health
Clean Air Branch
P.O. Box 3378
Honolulu, Hawaii 96801-3378
Phone: 808-586-4200
Fax: 808-586-4359

Section 2
DEFINITIONS

"Ambient Air": The general outdoor atmosphere, external to buildings, to which the general public has access.

"Ambient Air Quality": The quality or state of purity of the ambient air.

"Ambient Air Quality Standard": A limit in the quantity and exposure to pollutants dispersed or suspended in the ambient air.

"Carbon Monoxide": Carbon monoxide (CO) is a colorless, odorless, tasteless gas under atmospheric conditions. It is produced by the incomplete combustion of carbon fuels with the majority of emissions coming from transportation sources.

"Collocated": Procedure required for a certain percentage of PM_{10} samplers in the monitoring network. Collocated samplers determine precision or variation in the PM_{10} concentration measurements of identical samplers run in the same location under the same sampling conditions.

"EPA": The United States Environmental Protection Agency.

"Hydrogen Sulfide": Hydrogen sulfide (H_2S) is a toxic, colorless gas with a characteristic "rotten egg" odor detectable at very low levels. Also known as sewer gas, it is naturally occurring from sources such as volcanic activity, petroleum exploration and bacterial decomposition of organic matter.

"NAAQS": National Ambient Air Quality Standards. These are pollutant standards that the EPA has established to protect public health and welfare. NAAQS have been set for carbon monoxide, nitrogen dioxide, PM_{10}, ozone, sulfur dioxide, and lead. These are commonly referred to as the six criteria pollutants.

"NAMS": National Air Monitoring Stations. Sites which are part of the SLAMS network, must meet more stringent siting requirements, equipment type and quality assurance criteria.

"Nitrogen Dioxide": Nitrogen dioxide (NO_2) is a brownish, highly corrosive gas with a pungent odor. It is formed in the atmosphere from emissions of nitrogen oxides (NO_x). Sources of nitrogen oxides include electric utilities, industrial boilers, motor vehicle exhaust and combustion of fossil fuels. NO_2 is also a component in the atmospheric reaction that produces ground-level ozone.

"Ozone": This is the main constituent in photochemical air pollution. It is formed in the atmosphere by a chemical reaction of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. In the upper atmosphere, ozone (O_3) shields the earth from harmful ultraviolet radiation; however, at ground level, it can cause harmful effects in humans and plants.

"Particulate Matter": Any dispersed matter, solid or liquid, in which the individual aggregates are larger than the single molecules in diameter, but smaller than 500 microns. Particulate matter includes dust, soot, smoke, and liquid droplets from sources such as factories, power plants, motor vehicles, construction activities, agricultural activities, and fires.

"PM_{10}": Particulate matter that is 10 microns or less in aerodynamic diameter. The EPA revised the NAAQS for particulate matter in 1987 to cover only PM_{10} because the smaller particles have a greater potential for respiratory health impacts.

"SLAMS" State and Local Air Monitoring Stations. The Clean Air Act requires that every state establish a network of air monitoring stations for criteria pollutants, using requirements set by the EPA Office of Air Quality Planning and Standards.

"Sulfur Oxides": Sulfur oxides are colorless gases which include sulfur dioxide (SO_2), sulfur trioxide, their acids and the salts of their acids. Emissions of sulfur oxides are largely from sources that burn fossil fuels such as coal and oil. In the State of Hawaii, another source of sulfur oxide emissions is from the eruption of Kilauea Volcano on the Big Island.

"Vog": Vog is a local term used when referring to the atmospheric haze produced by the combination of volcanic gas and particles with air and sunlight.

Table 2-1 **State of Hawaii and Federal Ambient Air Quality Standards**

Air Pollutant	Averaging Time	Standards		
		Hawaii State Standard [a] ($\mu g/m^3$)	Federal Primary Standard [b] ($\mu g/m^3$)	Federal Secondary Standard [c] ($\mu g/m^3$)
Carbon Monoxide	1-hour 8-hour	10,000 5,000	40,000 10,000	40,000 10,000
Nitrogen Dioxide	Annual (arithmetic)	70	100	100
PM_{10}	24-hour Annual (arithmetic)	150 50	150 50	150 50
Ozone	1-hour	100	235	235
Sulfur Dioxide	3-hour 24-hour Annual (arithmetic)	1,300 365 80	--- 365 80	1,300 --- ---
Lead	Calendar Quarter (arithmetic)	1.5	1.5	1.5
Hydrogen Sulfide	1-hour	35	—	---

[a] Designated to protect public health and welfare and to prevent the significant deterioration of air quality. Source: HAR §11-59-1
[b] Designated to prevent against adverse effects on public health. Source: 40CFR Part 50
[c] Designated to prevent against adverse effects on public welfare, including effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials. Source: 40CFR Part 50

Section 3
SITE LOCATIONS AND DESCRIPTIONS

This section provides a description of the monitoring stations in the State of Hawaii. Table 3-1 lists the air pollutant(s) measured at each monitoring station, characterizes the area surrounding the station, and indicates the start dates for data collection. Table 3-2 identifies the type of sampler used to measure the concentration of each air pollutant. Figures 3-1, 3-2, 3-3 and 3-4 show the location of each monitoring station on the islands of Oahu, Kauai, Maui and Hawaii, respectively.

The following three subsections discuss each monitoring station in more detail.

A. ISLAND OF OAHU

1. Honolulu: Located atop the Department of Health (DOH) building (Kinau Hale), at 1250 Punchbowl Street in downtown Honolulu, this site is in a commercial, institutional, and residential area. It was established in April 1971 as a NAMS and SLAMS station. The pollutants sampled at this site are PM_{10}, CO, and SO_2.

2. Pearl City: Located atop the Leeward Medical Center, at 860 Fourth Street, the area is a combination of commercial and residential units and is approximately nine and a half miles northwest of downtown Honolulu. This site was established in April 1971 as a NAMS site initially for collection of Total Suspended Particulates (TSP) before it was changed to PM_{10} sampling in July 1985.

3. Waimanalo: Located within the Waimanalo Sewage Treatment Facility, at 41-1069 Kalanianaole Highway, this site is in a sparsely populated rural and agricultural community. Waimanalo is on the windward (upwind) side of Oahu approximately ten miles east-northeast of downtown Honolulu. This site was established in June 1971 as a SLAMS site initially for the sampling of TSP before it was changed to PM_{10} sampling in July 1989.

4. Sand Island: Located at the Anuenue Fisheries, the area is composed of light industrial, commercial, recreational, and harbor units and is approximately two miles southwest (typically downwind) of downtown Honolulu. This is a NAMS station that was established in February 1981 for the sampling of ozone.

5. Waikiki: Located at 2131 Kalakaua Avenue, Waikiki is a busy commercial and residential area with heavy vehicular traffic. It is approximately three miles southeast of downtown Honolulu. The station was established in January 1981as a NAMS site for the sampling of carbon monoxide.

6. Liliha: Located at Kauluwela Elementary School, 1486 Aala Street, this site is in a residential and commercial area near the H-1 freeway, approximately one and a quarter miles north of downtown Honolulu. This NAMS station was established in January 1984 and currently monitors for PM_{10}.

7. Makaiwa: Located at 92-670 Farrington Highway, this site is in a residential and agricultural area approximately twenty-five miles west of downtown Honolulu. This station is downwind and to the southeast of an electrical power plant. This site was established in July 1989 as a SLAMS station monitoring for SO_2.

8. West Beach: Located within the Ko'Olina Golf Course, this site is in a recreational, residential, and agricultural area approximately 27 miles west of downtown Honolulu and 1.5 miles northwest of Campbell Industrial Park. This SLAMS station was established in February 1991 for NO_2, PM_{10}, CO and SO_2.

9. Kapolei: Located at 91-591 Kalaeloa Boulevard at the entrance to Campbell Industrial Park, this site is in a commercial, industrial, and residential area with nearby agricultural lands. It is approximately 25 miles west of downtown Honolulu and was established in February 1991 as a SLAMS site. Air pollutants measured at the site include NO_2, PM_{10}, CO and SO_2.

B. ISLAND OF KAUAI

Lihue: The Lihue monitoring station is located in downtown Lihue at the District Health Office, 3034 Umi Street. This site is in a commercial and residential area with nearby agricultural areas. It is a SLAMS station that was established in November 1972 for the sampling of total particulates but was changed to a PM_{10} sampling site in October 1985.

C. ISLAND OF MAUI

1. Kihei: This station is located in Hale Piilani Park. This special purpose monitoring station is in a residential and agricultural area and was established to monitor PM_{10} from sugarcane burning activities.

2. Paia: This station is located in a residential area at 141 Baldwin Avenue. The site is downwind of several sugarcane fields and is just northeast of the HC&S Co. Paia Mill. This site was established in August 1996 as a special PM_{10} sampling station for sugarcane burning activities.

D. ISLAND OF HAWAII

1. Kona: This station is located on the grounds of the Konawaena High School at 81-1043 Konawaena School Road in Kealakekua, Hawaii. This special purpose site was established in April 1997 to monitor vog in the Kona area. The pollutants sampled at this site are SO_2 and PM_{10}. The 1-in 6-day sampling for PM_{10} at this site was discontinued on June 11, 2000.

2. Hilo: Established in March 1995, this station is located on the grounds of the Adult Rehabilitation Center of Hilo at 1099 Waianuenue Avenue to monitor vog. The pollutants sampled are SO_2 and PM_{10}.

3. Honokaa: Located at Honokaa High and Intermediate School at 45-527 Pakalana Street, this station was established in August 1997 on the upwind side of the island to monitor vog. The pollutants sampled at this site are SO_2 and PM_{10}. This site was discontinued on August 1, 2000.

4. Lava Tree: This station in Puna, is located on the eastern border of the Lava Tree State Park in a residential-agricultural area near Nanawale Estates. It is approximately 1.4 miles northwest of the Puna Geothermal Venture power plant. The station was established in August 1993 and monitors for H_2S.

5. Puna E: Located in the Leilani Estates residential subdivision in Puna, it is approximately 3 miles south-southwest of the Puna Geothermal Venture power plant. Established in 1992, this station monitors for H_2S.

Table 3-1 **State of Hawaii Air Monitoring Network**

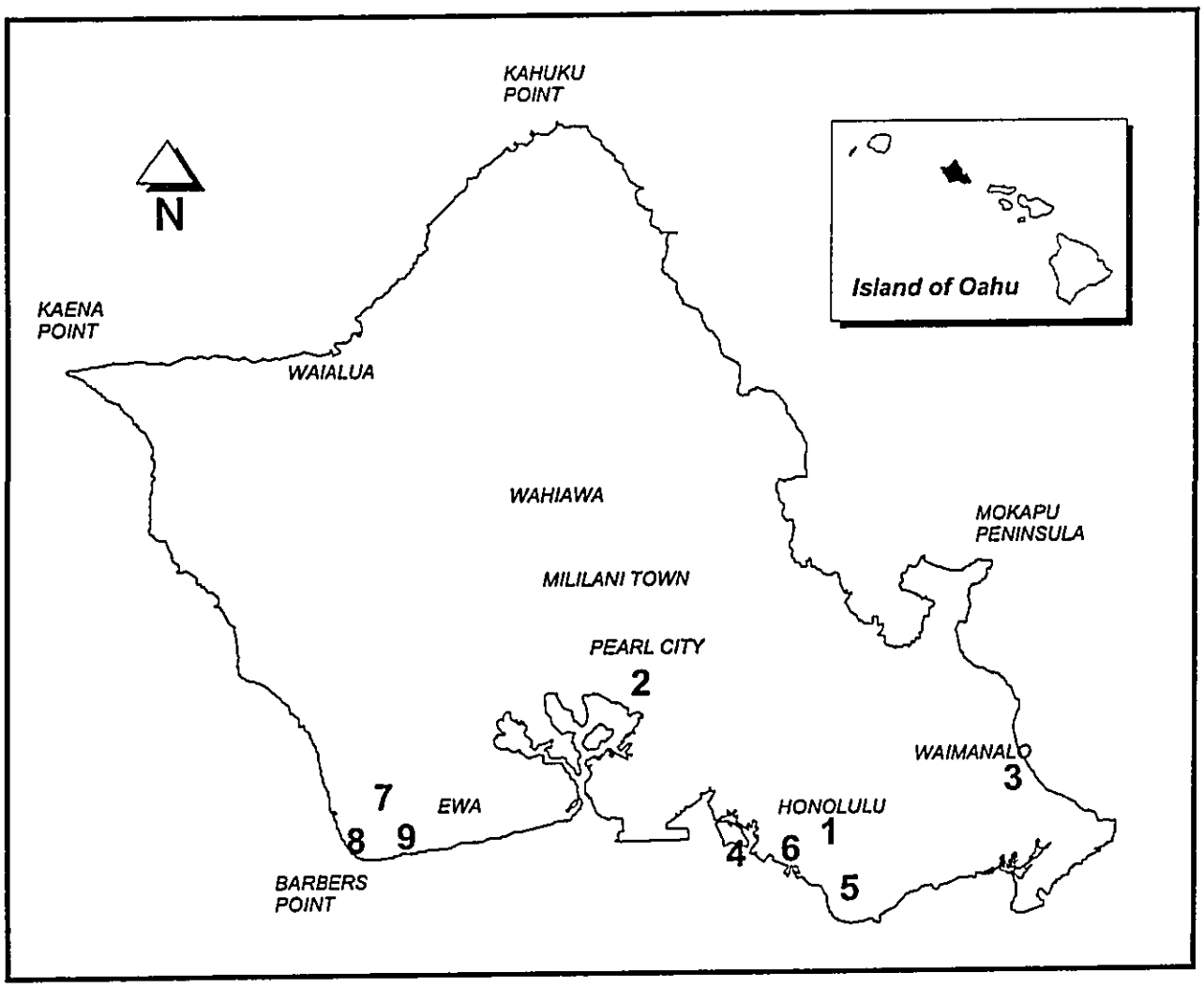
SITE	Station Type						SITE DESCRIPTION	START DATE
	PM_{10}	CO	O_3	SO_2	NO_2	H_2S		
OAHU								
HONOLULU	N	N	-	S	-	-	Center City/Commercial	April 1971
PEARL CITY	N	-	-	-	-	-	Suburban/Residential	April 1971
WAIMANALO	S	-	-	-	-	-	Rural / Agricultural	July 1989
SAND ISLAND	-	-	N	-	-	-	Center City	January 1981
WAIKIKI	-	N	-	-	-	-	Center City	February 1981
LILIHA	N	-	-	-	-	-	Center City	January 1981
MAKAIWA	-	-	-	S	-	-	Rural / Industrial	July 1989
WEST BEACH	S,C	S	-	S	S	-	Rural/Industrial	February 1991
KAPOLEI	S	S	-	S	S	-	Rural / Industrial	February 1991
KAUAI								
LIHUE	S	-	-	-	-	-	Center City / Commercial	October 1985
MAUI								
KIHEI	SS	-	-	-	-	-	Suburban / Residential	June 1996
PAIA	SS	-	-	-	-	-	Rural / Residential	August 1996
HAWAII								
KONA	SS	-	-	SS	-	-	Suburban	April 1997
HILO	SS	-	-	SS	-	-	Center City	March 1995
HONOKAA	SS	-	-	SS	-	-	Rural/Agricultural	May 1997
LAVA TREE	-	-	-	-	-	SS	Rural/Agricultural	August 1993
PUNA E	-	-	-	-	-	SS	Rural/Agricultural	1992

N = (NAMS) National Air Monitoring Station
C = Collocated Site
S = (SLAMS) State and Local Air Monitoring Stations
SS = Special Study (for sugar cane burning, vog, and geothermal energy)

Table 3-2 **Sampling Equipment at Each Monitoring Station**

Monitoring Station	PM_{10} Continuous Ambient Particulate Monitor	PM_{10} Manual Ambient Particulate Monitor (1 in 6 day)	CO Continuous Non-dispersive Infrared Analyzer	SO_2 Continuous Pulsed Fluorescent Ambient Air Analyzer	O_3 Continuous UV Photometric Analyzer	NO_2 Continuous Chemiluminescence Analyzer	H_2S Continuous Pulsed Fluorescent Ambient Air Analyzer
OAHU							
Honolulu	X		X	X			
Pearl City	X						
Waimanalo		X					
Sand Island					X		
Waikiki			X				
Liliha	X						
Makaiwa				X			
West Beach		X	X	X		X	
Kapolei	X		X	X		X	
KAUAI							
Lihue		X					
MAUI							
Kihei	X						
Paia	X						
HAWAII							
Kona		X		X			
Hilo		X		X			
Honokaa		X		X			
Lava Tree							X
Puna E							X

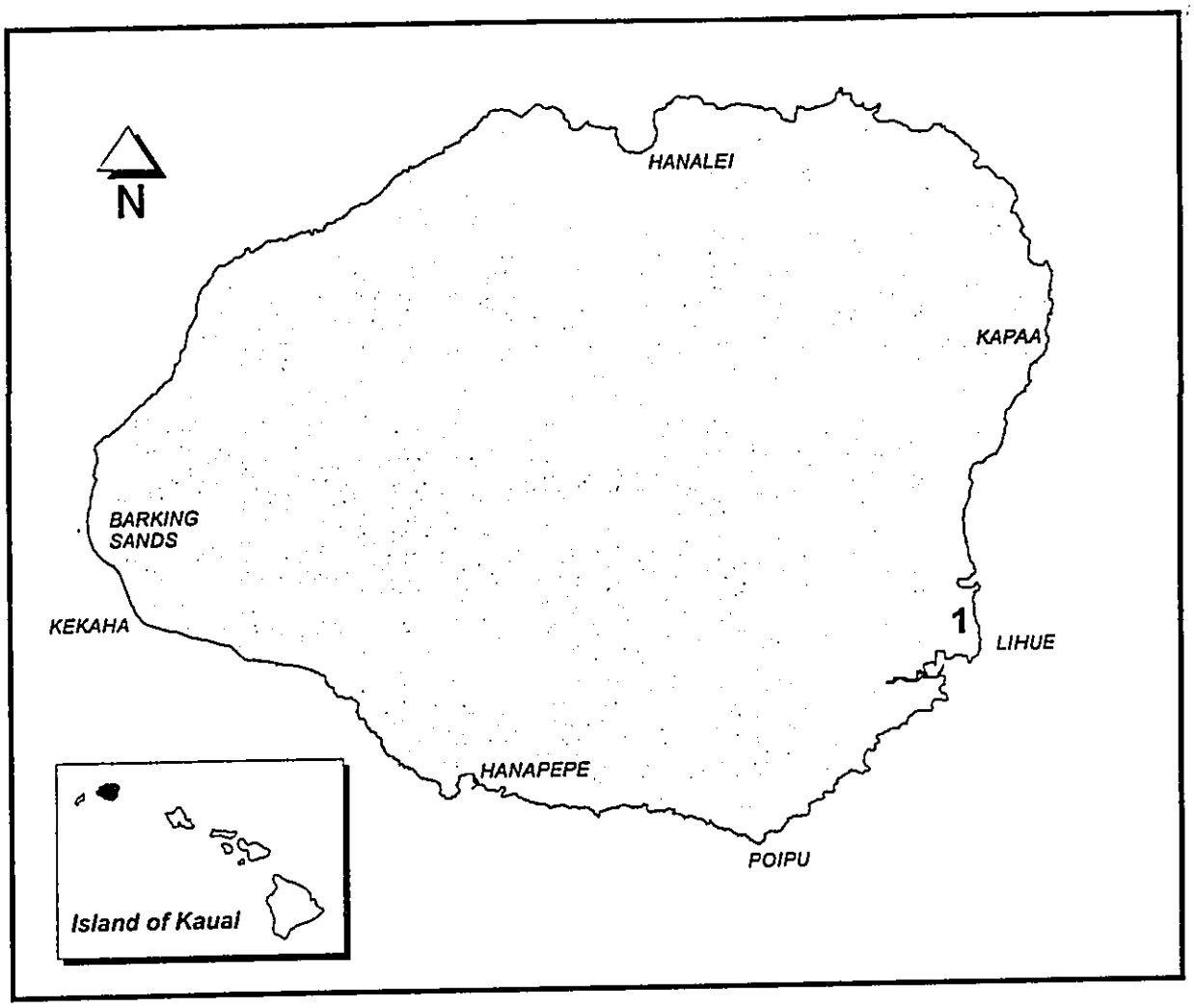
Figure 3-1 **Island of Oahu: Location of Air Monitoring Stations**



LEGEND

1. Honolulu (PM_{10}, SO_2, CO)
2. Pearl City (PM_{10})
3. Waimanalo (PM_{10})
4. Sand Island (O_3)
5. Waikiki (CO)
6. Liliha (PM_{10})
7. Makaiwa (SO_2)
8. West Beach (PM_{10}, SO_2, CO, NO_2)
9. Kapolei (PM_{10}, SO_2, CO, NO_2)

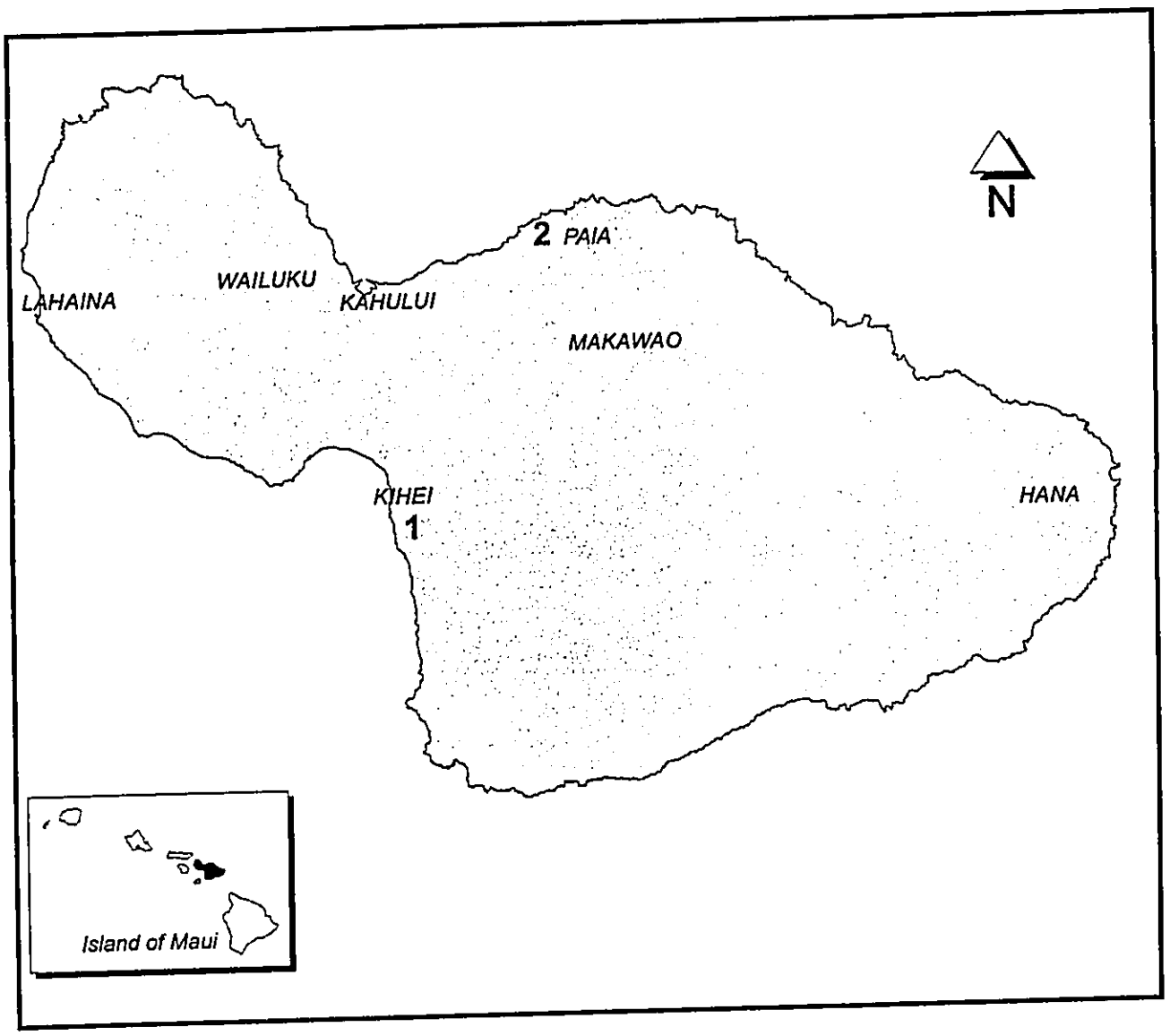
Figure 3-2 **Island of Kauai: Location of Air Monitoring Station**



LEGEND

1 Lihue (PM_{10})

Figure 3-3 **Island of Maui: Location of Air Monitoring Stations**

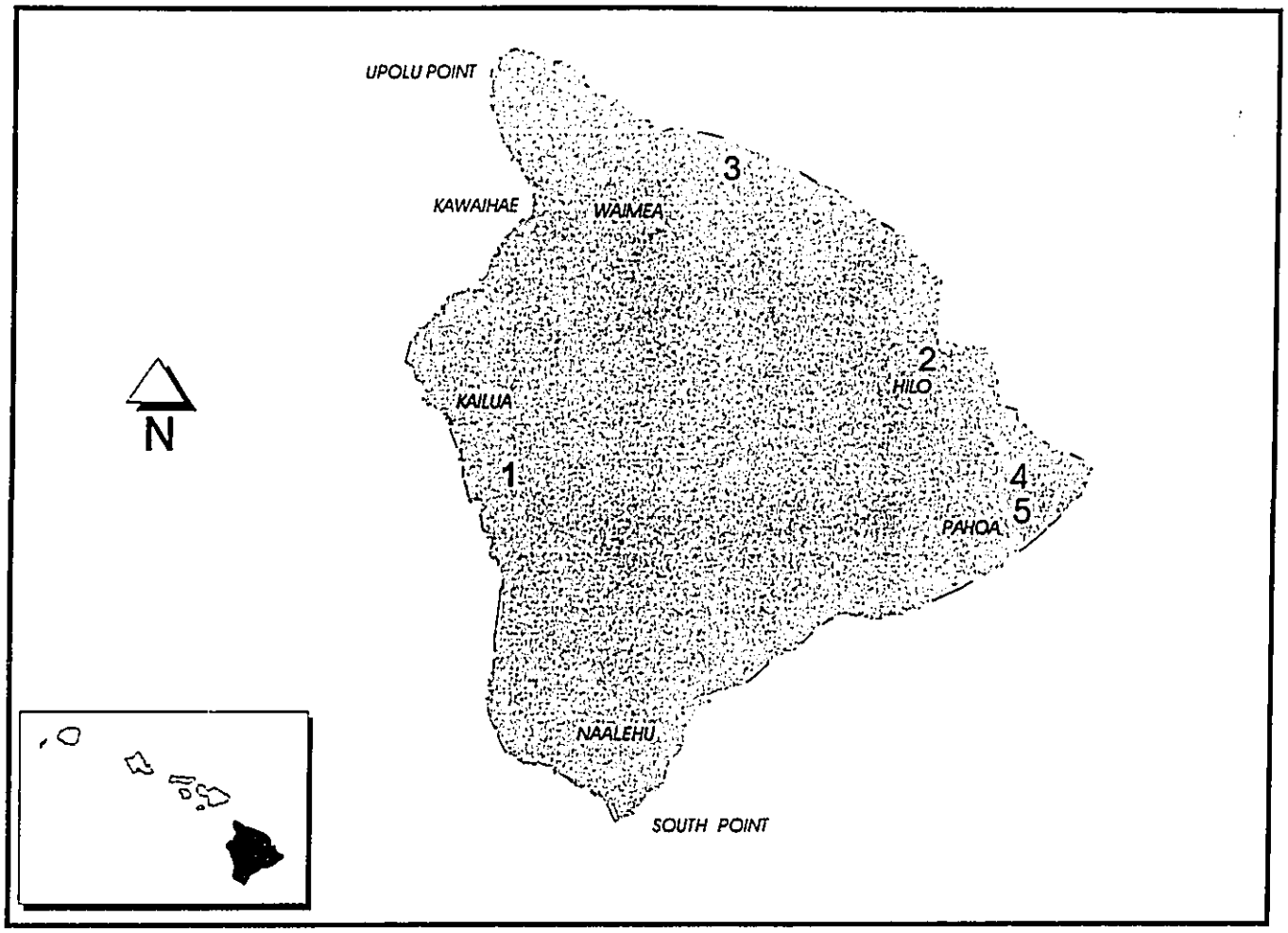


LEGEND

1 Kihei (PM_{10})

2 Paia (PM_{10})

Figure 3-4 **Island of Hawaii: Location of Air Monitoring Stations**



LEGEND

1 Kona (PM_{10}, SO_2)
2 Hilo (PM_{10}, SO_2)
3 Honokaa (PM_{10}, SO_2)
4 Lava Tree (H_2S)
5 Puna E (H_2S)

Section 4

2000 AIR QUALITY DATA

Hawaii enjoys some of the best air quality in the nation and, being an island state, is not impacted by pollution from neighboring states. However, as in any metropolitan area, there is some air pollution from various industrial and mobile sources in addition to agricultural and natural sources. The Department of Health, Clean Air Branch, has the responsibility for monitoring, protecting and enhancing the state's air quality and regulates and monitors pollution sources to ensure that the levels of criteria pollutants remain well below the state and federal air quality standards.

The following tables summarize the pollutant concentrations measured at each monitoring station. Tables 4-1 through 4-7 are annual summaries grouped by pollutant and provide the number of occurrences exceeding the NAAQS. There is no federal ambient air quality standard for H_2S, and Table 4-8 provides the number of occurrences exceeding the state standard.

The annual statistics provided in tables 4-1 through 4-8 are the highest and second highest $\mu g/m^3$ values recorded in the year for the averaging period and the annual means, which is the arithmetic mean of all valid hours recorded in the year. The possible periods is the total number of possible sampling periods in the year for the averaging time, and valid periods is the total number of sampling periods after data validation.

Tables 4-9 through 4-16 are monthly summaries of the range and average of each pollutant for each averaging period. The range is the lowest and highest $\mu g/m^3$ values recorded in the month for the averaging period and the average is the arithmetic mean of all hours recorded in the month. The highest value recorded in the year for each site is highlighted.

In the year 2000, the State of Hawaii was in attainment for all federal ambient air quality standards.

Table 4-1 **Annual Summary of 24-Hour PM_{10}**

	Annual Statistics			24-hour Occurrences Greater than 150 µg/m³													
	Max Hr		Annual Means														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	83	31	14	0	0	0	0	0	0	0	0	0	0	0	0	366	361
Liliha	65	44	15	0	0	0	0	0	0	0	0	0	0	0	0	366	363
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[a]Waimanalo	35	28	17	0	0	0	0	0	0	0	0	0	0	0	0	61	47
Pearl City	164[b]	154[b]	16	1[b]	0	0	0	0	0	0	0	0	0	0	1[b]	366	358
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	148	129	17	0	0	0	0	0	0	0	0	0	0	0	0	366	356
[a]West Beach	41	40	14	0	0	0	0	0	0	0	0	0	0	0	0	61	54
KAUAI																	
[a]Lihue	39	36	18	0	0	0	0	0	0	0	0	0	0	0	0	61	50
MAUI																	
Kihei	83	77	25	0	0	0	0	0	0	0	0	0	0	0	0	366	355
Paia	48	45	18	0	0	0	0	0	0	0	0	0	0	0	0	366	350
HAWAII																	
[a]Kona	23	23	18	0	0	0	0	0	0	0	0	0	0	0	0	28[c]	17
[a]Hilo	18	16	11	0	0	0	0	0	0	0	0	0	0	0	0	61	41
[a]Honokaa	23	17	10	0	0	0	0	0	0	0	0	0	0	0	0	36[d]	22
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[a] PM_{10} sampling once every 6th day
[b] Highest values, measured by a continuous method, occurred on 1/1/00 and 12/31/00, probably due to fireworks
[c] PM_{10} sampling was discontinued at this site on 6/11/00
[d] This station was discontinued on 8/1/00

Table 4-2 Annual Summary of 1-Hour Carbon Monoxide

	Annual Statistics			1-hour Occurrences Greater than 40,000 µg/m³													
	Max Hr		Annual Means														
OAHU	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
Honolulu	3990	3762	774	0	0	0	0	0	0	0	0	0	0	0	0	8784	8726
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	4332	4332	905	0	0	0	0	0	0	0	0	0	0	0	0	8784	8728
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	2508	1596	336	0	0	0	0	0	0	0	0	0	0	0	0	8784	8595
West Beach	1596	1596	197	0	0	0	0	0	0	0	0	0	0	0	0	8784	8368
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hilo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honokaa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4-3 **Annual Summary of 8-Hour Carbon Monoxide**

	Annual Statistics			8-hour Occurrences Greater than 10,000 µg/m³													
	— Max Hr—		--Annual Means--														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	1753	1724	774	0	0	0	0	0	0	0	0	0	0	0	0	1098	1091
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	2166	2038	905	0	0	0	0	0	0	0	0	0	0	0	0	1098	1094
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	1055	827	336	0	0	0	0	0	0	0	0	0	0	0	0	1098	1076
West Beach	1012	627	197	0	0	0	0	0	0	0	0	0	0	0	0	1098	1042
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hilo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honokaa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4-4 **Annual Summary of 1-Hour Ozone**

	Annual Statistics — Max Hr		Annual Means	1-hour Occurrences Greater than 235 µg/m³													
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	98	96	32	0	0	0	0	0	0	0	0	0	0	0	0	8784	8482
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Beach	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hilo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honokaa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4-5 **Annual Summary of 3-Hour Sulfur Dioxide**

	Annual Statistics			3-hour Occurrences Greater than 1,300 µg/m³													
	Max Hr		Annual Means														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	65	18	1	0	0	0	0	0	0	0	0	0	0	0	0	2928	2832
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	72	69	3	0	0	0	0	0	0	0	0	0	0	0	0	2928	2862
Kapolei	23	18	1	0	0	0	0	0	0	0	0	0	0	0	0	2928	2505
West Beach	11	9	1	0	0	0	0	0	0	0	0	0	0	0	0	2928	2304
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	50	49	6	0	0	0	0	0	0	0	0	0	0	0	0	2928	2897
Hilo	438	301	4	0	0	0	0	0	0	0	0	0	0	0	0	2928	2277
Honokaa	213	176	4	0	0	0	0	0	0	0	0	0	0	0	0	1704*	1691
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* This station was discontinued on 8/1/00

Table 4-6 **Annual Summary of 24-Hour Sulfur Dioxide**

	Annual Statistics			24-hour Occurrences Greater than 365 µg/m³													
	Max Hr		Annual Means														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	9	7	1	0	0	0	0	0	0	0	0	0	0	0	0	366	357
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	20	17	3	0	0	0	0	0	0	0	0	0	0	0	0	366	361
Kapolei	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	366	362
West Beach	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	366	333
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	25	16	6	0	0	0	0	0	0	0	0	0	0	0	0	366	365
Hilo	94	73	4	0	0	0	0	0	0	0	0	0	0	0	0	366	284
Honokaa	61	28	4	0	0	0	0	0	0	0	0	0	0	0	0	213*	213
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* This station was discontinued on 8/1/00

Table 4-7 **Annual Summary of Nitrogen Dioxide**

	Annual Statistics			Annual Occurrences Greater than 100 µg/m³													
	Max Hr		Annual Means														
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	-	-	9	-	-	-	-	-	-	-	-	-	-	-	0	8784	7213
West Beach	-	-	7	-	-	-	-	-	-	-	-	-	-	-	0	8784	8104
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hilo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honokaa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lava Tree	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Puna E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 4-8 **Annual Summary of 1-Hour Hydrogen Sulfide**

	Annual Statistics — Max Hr		Annual Means-	1-hour Occurrences Greater than 35 µg/m³													
	1st High	2nd High	All Hours	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Possible Periods	Valid Periods
OAHU																	
Honolulu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liliha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waikiki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sand Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waimanalo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pearl City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Makaiwa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kapolei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Beach	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KAUAI																	
Lihue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAUI																	
Kihei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAWAII																	
Kona	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hilo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honokaa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lava Tree	7	7	2	0	0	0	0	0	0	0	0	0	0	0	0	8784	8319
Puna E	13	7	<1	0	0	0	0	0	0	0	0	0	0	0	0	8784	8276

Table 4-9 **Monthly Summary of 24-Hour PM_{10} ($\mu g/m^3$)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Honolulu	Range	7-*83*	9-21	7-31	8-21	8-21	7-15	10-17	9-21	7-18	12-22	9-23	8-20
	Average	15	15	16	15	14	11	13	15	13	16	15	14
Liliha	Range	10-*65*	9-21	13-36	9-25	9-22	8-16	10-18	9-19	7-18	9-21	10-20	8-44
	Average	16	16	19	16	15	11	14	14	12	15	15	14
Pearl City	Range	8-*164*	9-24	8-33	8-21	9-21	7-17	10-19	10-20	8-18	13-24	13-26	11-154
	Average	19	16	17	15	14	12	14	15	13	16	19	15
Waimanalo[a]	Range	10	20	6-15	16-*35*	12-20	11-15	17-22	14-25	9-18	12-28	7-22	8-18
	Average	10	20	10	23	16	14	18	17	14	22	16	13
Kapolei	Range	8-*148*	7-38	9-41	7-129	9-35	8-27	10-30	8-19	8-16	8-52	8-26	7-22
	Average	19	19	17	28	18	16	14	13	12	16	14	14
West Beach[a]	Range	3-19	7-16	10-32	13-19	10-*41*	10-40	8-12	8-11	7-12	8-17	8	5-13
	Average	11	14	17	15	23	18	10	10	9	14	8	9
Lihue[a]	Range	11-21	27-36	13-*39*	16-21	12-24	13-18	15-20	16-29	13-21	14-27	12-22	8-22
	Average	14	32	20	18	20	15	17	24	17	21	16	15
Kihei	Range	9-48	14-67	10-41	10-77	15-64	13-54	16-62	10-46	14-52	13-77	5-37	9-*83*
	Average	17	25	20	23	28	26	35	29	27	30	17	18
Paia	Range	7-*48*	9-30	10-42	10-23	10-28	11-45	12-26	13-32	12-30	12-21	12-23	10-33
	Average	15	19	22	16	16	16	17	18	19	16	16	19
Kona[a]	Range	No Data	13-21	16-17	16-22	17-*23*	14-15	PM_{10} Sampling discontinued at this site on 6/16/00					
	Average		18	16	19	20	14						
Hilo[a]	Range	7-13	10-16	8-12	No Data	No Data	10-10	10-15	9-14	6-11	7-16	8	6-*18*
	Average	10	13	11			10	13	11	8	12	8	10
Honokaa[a]	Range	4-11	8-*23*	12-12	No Data	9-11	7-11	4-10	Station discontinued on 8/01/00				
	Average	7	15	12		10	10	8					

[a] Sampling is once every 6th day

Table 4-10 **Monthly Summary of 1-Hour Carbon Monoxide (µg/m^3)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Honolulu	Range	342-3990	456-3192	456-2508	456-1368	342-2052	114-2166	342-2052	456-1824	342-2508	228-2052	456-3762	342-2964
	Average	755	925	870	706	710	746	696	793	813	549	907	832
Waikiki	Range	342-4332	456-4332	342-2964	228-1938	456-2280	114-2166	114-1710	456-2166	456-2850	570-2508	0-3078	0-2964
	Average	963	1193	1175	679	907	1065	603	790	1003	978	718	788
Kapolei	Range	0-1368	0-1596	0-912	0-798	0-1596	0-1140	0-2508	228-912	0-1140	0-1140	0-1482	114-1596
	Average	285	287	283	219	353	216	490	404	345	327	320	495
West Beach	Range	0-798	0-1254	0-798	0-570	0-1140	0-456	0-1026	114-456	0-570	0-684	0-1596	0-912
	Average	133	230	267	181	274	235	164	146	103	218	228	189

Table 4-11 **Monthly Summary of 8-Hour Carbon Monoxide (µg/m^3)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Honolulu	Range	371-1582	641-1525	599-1268	485-955	442-1012	356-1097	371-998	556-1112	413-1724	342-1254	584-1753	399-1397
	Average	755	925	870	706	710	746	696	793	813	549	907	832
Waikiki	Range	485-2166	684-2009	684-1724	342-1411	684-1226	399-1496	257-1040	542-1466	627-2038	670-1425	14-1995	86-1568
	Average	963	1193	1175	679	907	1065	603	790	1003	978	718	788
Kapolei	Range	95-613	100-556	100-584	29-485	0-1055	0-584	114-741	257-584	71-827	86-556	14-684	114-812
	Average	285	287	283	219	353	216	490	404	345	327	320	495
West Beach	Range	71-314	128-371	114-456	100-342	114-385	100-413	49-342	114-342	0-244	14-499	0-1012	14-399
	Average	133	230	267	181	274	235	164	146	103	2128	228	189

Table 4-12 **Monthly Summary of 1-Hour Ozone (µg/m³)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Sand Island	Range	0-86	0-88	0-90	2-98	2-76	2-47	2-51	0-53	0-39	0-55	0-69	0-80
	Average	47	32	45	55	32	20	21	22	15	27	33	30

Table 4-13 **Monthly Summary of 3-Hour Sulfur Dioxide (µg/m³)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Honolulu	Range	0-65	0-17	3-18	0-3	0-2	0-3	0-2	0-17	0-6	0-7	0-7	0-5
	Average	1	4	3	<1	<1	<1	<1	<1	1	3	<1	1
Makaiwa	Range	0-27	0-48	0-55	0-12	0-61	0-46	0-8	0-18	0-49	0-61	0-25	2-72
	Average	2	5	3	2	4	3	2	3	4	3	3	6
Kapolei	Range	0-18	0-14	0-5	0-3	0-16	0-14	0-14	0-9	0-3	0-10	0-3	0-23
	Average	3	1	1	<1	1	1	1	<1	<1	<1	<1	2
West Beach	Range	0-11	0-3	0-5	0-4	0-4	0-5	0-5	3-5	3-4	0-1	0-0	0-8
	Average	1	<1	1	1	2	3	3	3	3	<1	0	<1
Kona	Range	3-37	2-49	3-50	3-44	0-23	5-13	5-10	5-16	0-22	0-41	0-28	0-38
	Average	7	7	7	8	7	6	6	7	5	4	4	6
Hilo	Range	0-136	0-438	0-106	0-187	0-5	0-20	0-3	0-3	0-115	0-2	0-16	0-174
	Average	4	19	6	4	2	1	1	<1	1	<1	2	11
Honokaa	Range	0-98	1-213	1-49	2-3	0-3	3-45	0-3	Station discontinued on 8/01/00				
	Average	4	9	4	3	2	3	3					

Table 4-14 **Monthly Summary of 24-Hour Sulfur Dioxide (µg/m³)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Honolulu	Range	0-9	<1-7	3-6	0-3	0-<1	0-<1	0-<1	0-2	0-3	1-3	0-3	0-3
	Average	1	4	3	<1	<1	<1	<1	<1	1	3	<1	1
Makaiwa	Range	<1-12	2-16	1-13	<1-5	<1-11	<1-17	1-4	0-6	<1-10	1-11	1-7	3-20
	Average	2	5	3	2	4	3	2	3	4	3	3	6
Kapolei	Range	2-5	0-5	0-3	0-1	0-5	0-5	0-4	0-3	0-1	0-2	0-1	<1-6
	Average	3	1	1	<1	1	1	1	<1	<1	<1	<1	2
West Beach	Range	<1-4	<1-1	<1-3	1-2	1-3	1-4	1-4	3-4	3-3	0-<1	0-0	0-2
	Average	1	<1	1	1	2	3	3	3	3	<1	0	<1
Kona	Range	4-16	2-14	3-25	3-15	4-11	5-9	5-7	5-9	0-10	<1-12	0-10	2-16
	Average	7	7	7	8	7	6	6	7	5	4	4	6
Hilo	Range	0-41	1-94	<1-34	2-28	<1-3	<1-5	<1-3	0-1	0-26	<1-1	1-5	1-73
	Average	4	19	6	4	2	1	1	<1	1	<1	2	11
Honokaa	Range	1-25	2-61	2-15	2-3	1-3	3-12	2-3	Station discontinued on 8/01/00				
	Average	4	9	4	3	2	3	3					

Table 4-15 **Monthly Summary of 24-Hour Nitrogen Dioxide (µg/m³)** [a]

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Kapolei	Range	3-14	1-19	5-19	2-11	5-11	4-12	5-11	6-17	6-15	7-14	4-14	7-21
	Average	7	11	10	7	7	7	8	11	9	11	8	12
West Beach	Range	1-14	2-18	2-12	1-11	3-11	2-10	3-6	3-12	3-10	0-11	4-12	5-16
	Average	5	9	5	4	6	5	5	5	6	4	7	10

[a] There is no 24-hour state or federal standard for nitrogen dioxide

Table 4-16 **Monthly Summary of 1-Hour Hydrogen Sulfide (µg/m³)**

Station		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Lava Tree	Range	3-7	0-4	0-4	0-4	0-4	0-3	0-1	0-1	1-1	1-3	1-7	0-3
	Average	3	3	3	2	1	1	1	1	1	1	1	1
Puna E	Range	0-1	0-1	0-3	0-3	0-1	0-7	0-1	0-1	0-1	0-0	0-13	0-0
	Average	<1	<1	<1	<1	1	1	<1	<1	<1	0	<1	0

Section 5
AMBIENT AIR QUALITY TRENDS

The following graphs illustrate 5-year trends for PM_{10}, ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide from 1996 to 2000.

The graphs for PM_{10}, sulfur dioxide and nitrogen dioxide (figures 5-1, 5-2, 5-5 and 5-6, respectively) represent the annual averages for each year and for each station that monitors for that pollutant. Annual averages are derived by calculating the arithmetic mean of all valid hours recorded in the year. Included in the graphs are the state and federal annual standard(s).

The graphs for 1-hour ozone and 1-hour carbon monoxide (figures 5-3 and 5-4, respectively) represent the average of the daily maximum 1-hour values recorded in the year. These values are obtained by taking the highest recorded 1-hour value for each day then calculating the arithmetic mean of all those hours to arrive at the annual maximum average. Ozone and carbon monoxide do not have state or federal annual standards, however, included in the graphs are the 1-hour standards.

Figure 5-1 **Island of Oahu: PM_{10} Annual Average 1996 - 2000**

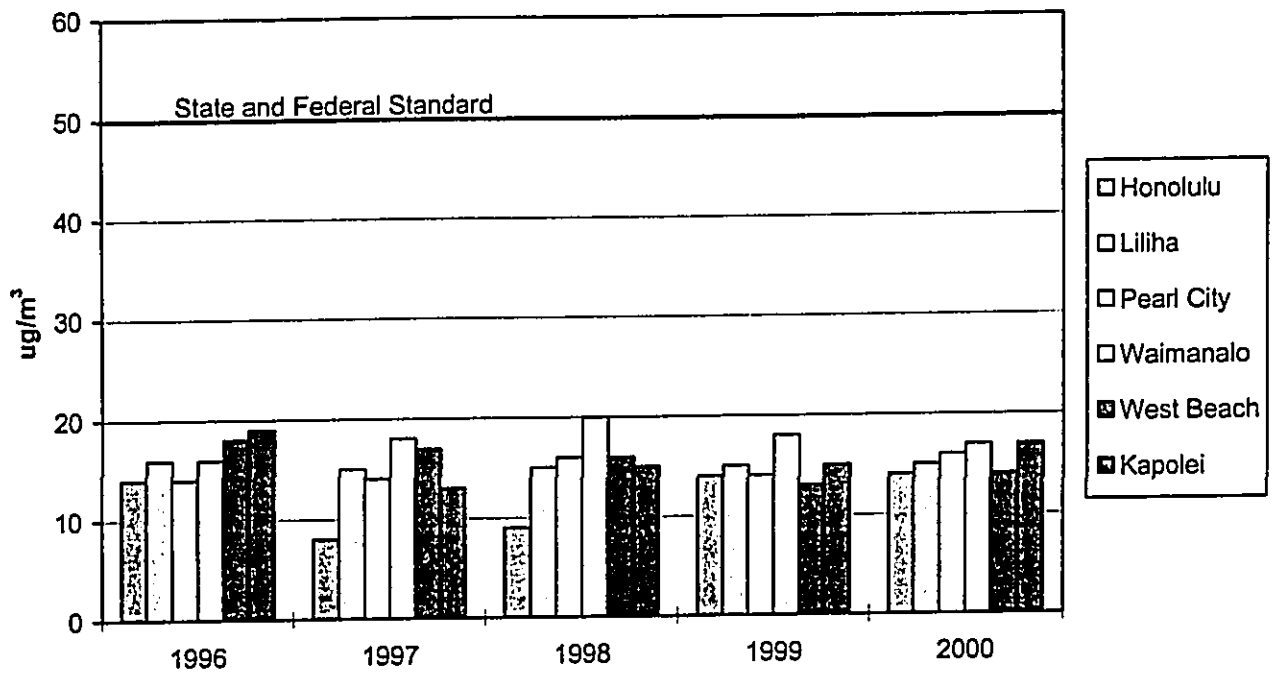


Figure 5-2 **Island of Kauai: PM_{10} Annual Average 1996 - 2000**

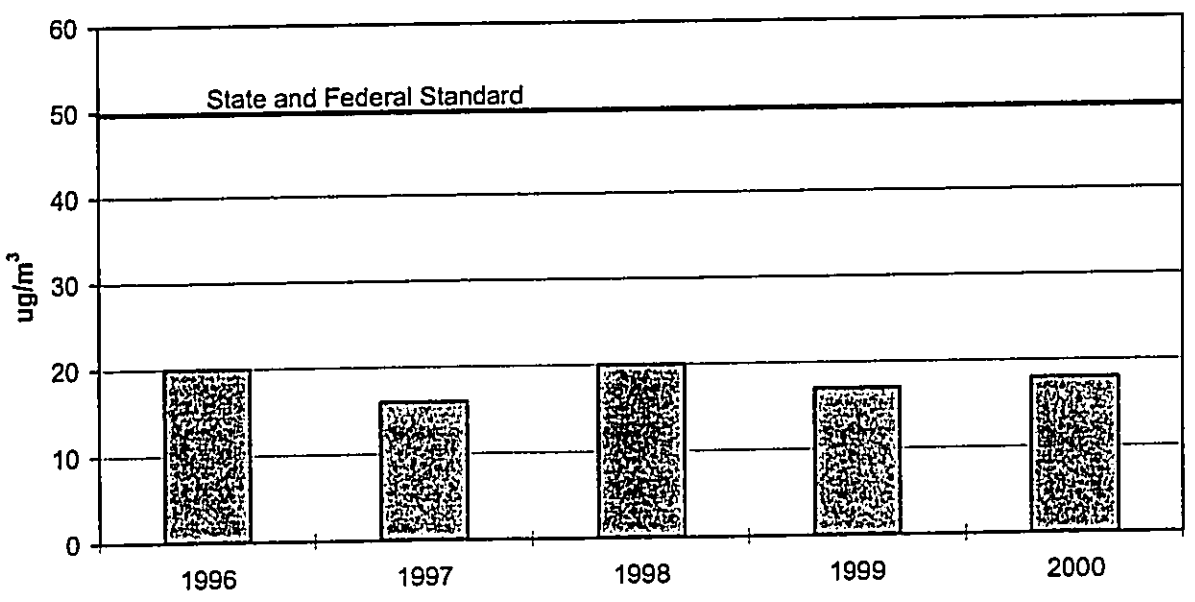


Figure 5-3 **Annual Average of Daily Maximum 1-Hour Ozone 1996 - 2000**

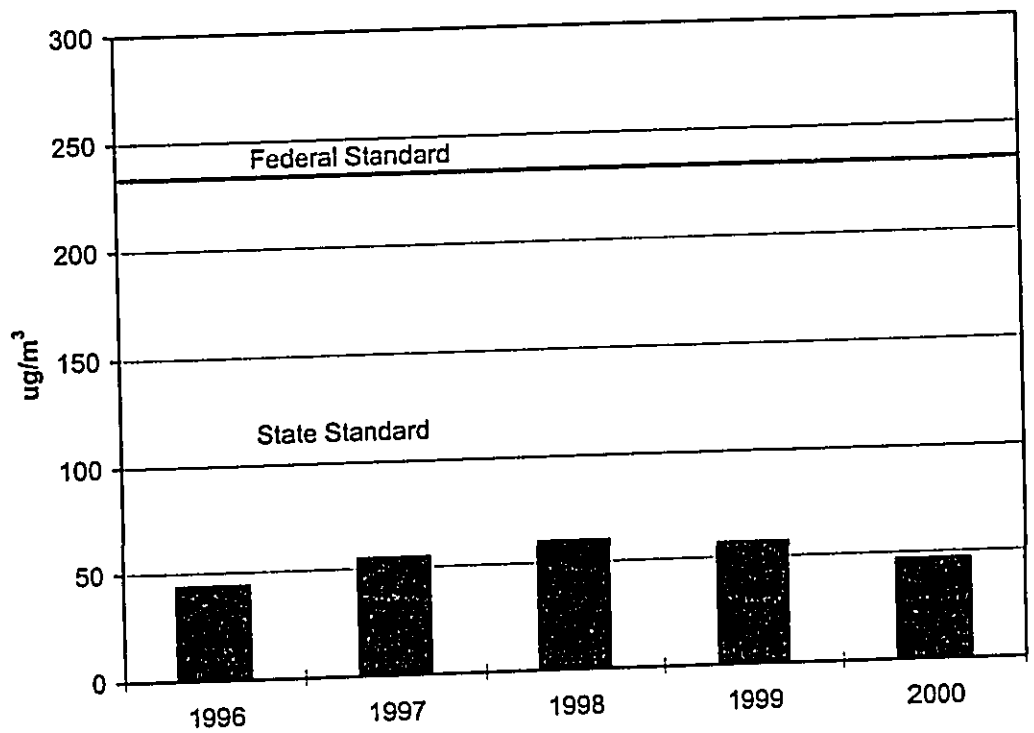


Figure 5-4 **Annual Average of Daily Maximum 1-Hour Carbon Monoxide 1996 - 2000**

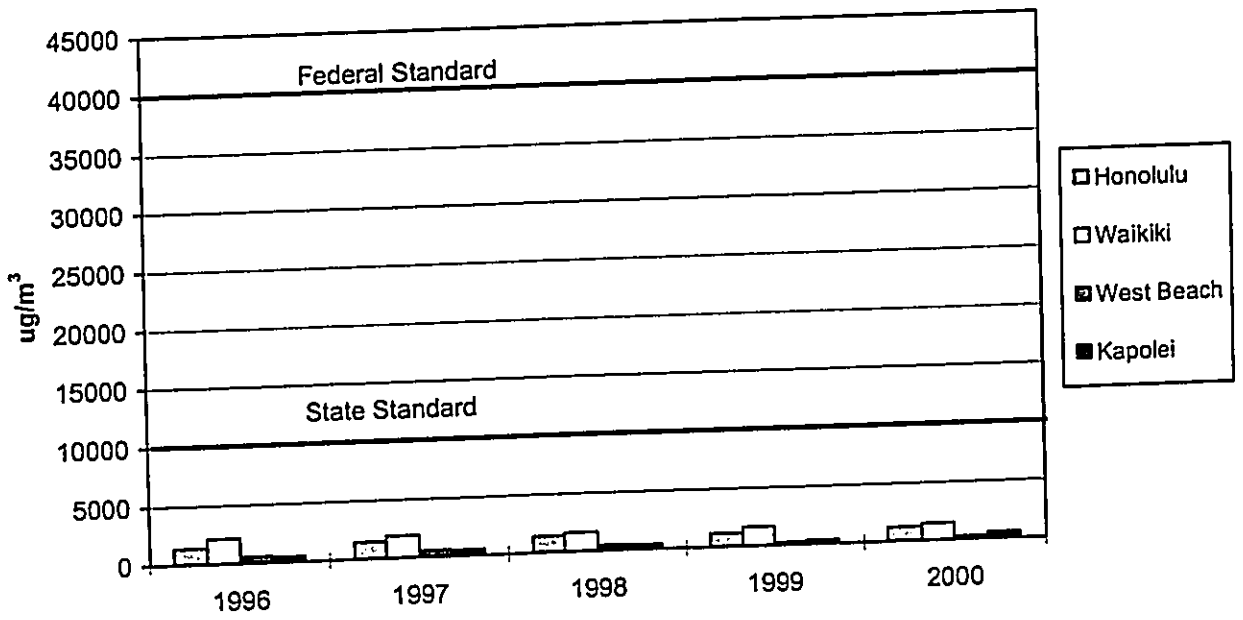


Figure 5-5 **Annual Average Sulfur Dioxide**
1996 - 2000

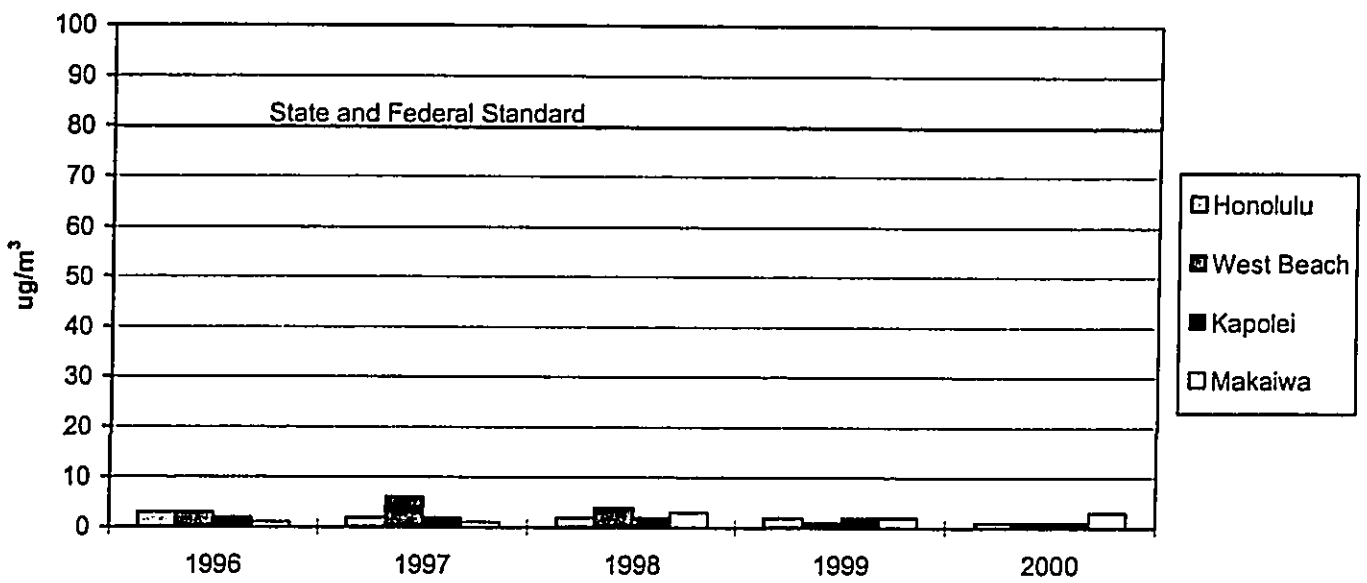
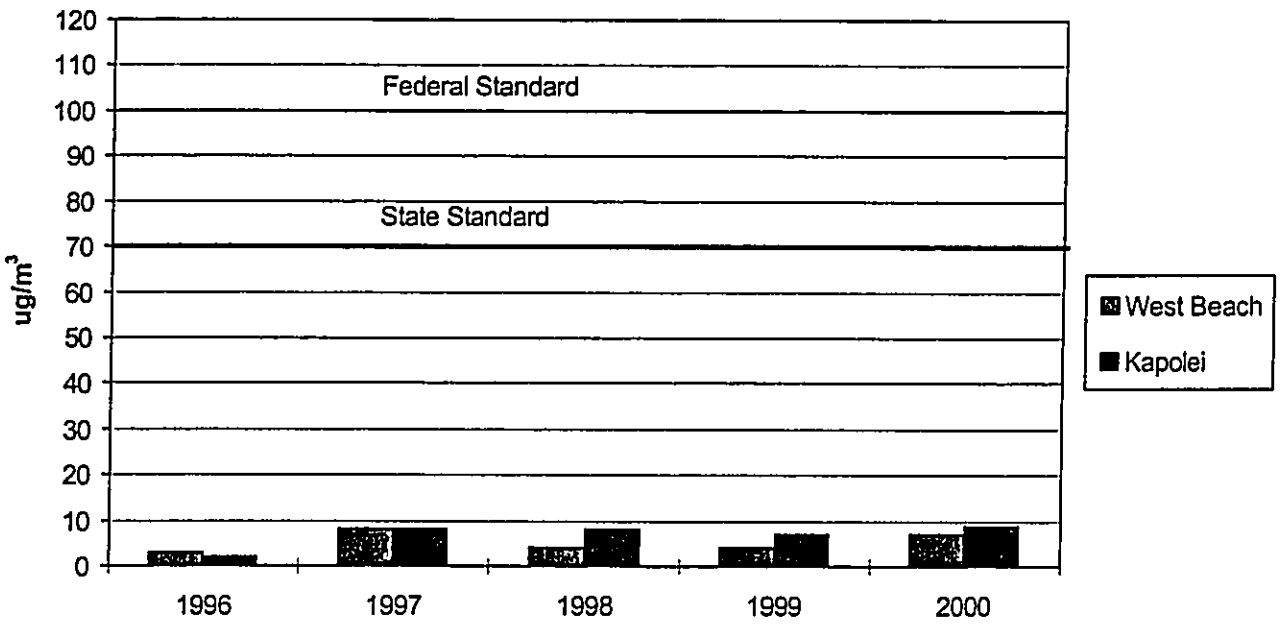


Figure 5-6 **Annual Average Nitrogen Dioxide**
1996 - 2000



APPENDIX D
Pre-Consultation Comment Letters and Responses

BENJAMIN J. CAYETANO
GOVERNOR

PT6602-2575

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
JEAN L. OSHITA
JADINE Y. URASAKI

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

IN REPLY REFER TO:
HWY-PS
2.6940

JUN 21 2002

RECEIVED
02 JUN 27 A8:02
DIRECTOR'S OFFICE
TRANSPORTATION SERVICES

Ms. Cheryl D. Soon
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear CHERYL Ms. Soon:

Subject: Draft Environmental Assessment (DEA) for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (TMK: 7-4-6: por 2 and por. 12), and Mililani, TMK: 9-5-53: por. 2)

Thank you for consulting us concerning the forthcoming DEA. We request that the DEA provide traffic volumes that would be generated by the proposed transit centers. The DEA should also include an explanation of how it was determined that 100 parking stalls would be needed at the Waianae Transit Center, 42 parking stalls would be needed at the Wahiawa transit center, and no parking stalls would be needed at the Mililani transit center.

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,

BRIAN K. MINAAI
Director of Transportation

c: AM Partners, Inc.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4432 • FAX: (808) 523-4730 • INTERNET: www.honolulu.gov

KENNETH HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

DE WAYNE H. OSHIRO
DEPUTY DIRECTOR

August 2, 2002

Brian K. Minaai, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Minaai:

Subject: Draft Environmental Assessment (DEA) for Transit Centers in Waianae (TMK: 8-6-1:29), Wahiawa (TMK: 7-4-6:2 and por.12), and Mililani (TMK: 9-5-53:por. 2).

Thank you for responding with regard to the forthcoming Transit Center DEA. Information regarding traffic volumes to be generated by the proposed projects will be reported in the DEA. The DEA will also address parking provisions associated with each of the projects. With regard to the Waianae project, provision of a park-and-ride lot for approximately 100 vehicles has been proposed based upon an assessment of potential use of such a facility if provided in conjunction with the proposed transit center at the proposed site. The Wahiawa project does not incorporate a park-and-ride component, but will include improvements to an existing parking lot used by staff of and visitors to the adjacent State agency office facilities. The proposed project is not intended to augment or duplicate the existing park-and-ride facilities provided at the Wahiawa Armory site. The Mililani project is not intended to augment or duplicate the existing Mililani Mauka park-and-ride facility.

If you have any questions or concerns, please contact James Burke, Project Manager, at 523-4445.

Sincerely,

CHERYL D. SOON
Director

cc: Gordon S. Wood, AIA, AM Partners, Inc.

PT 7/02 - 2965

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

July 19, 2002

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

LD-NAV
C&CoHDTSTRANSIT95532.RCM2
L-3405

Honorable Sheryl D. Soon
Department of Transportation Services
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

RECEIVED
02 JUL 24 P12:42
DIRECTOR'S OFFICE
TRANSPORTATION SERVICES

Dear Ms. Soon:

Subject: Pre-Consultation – Department of Transportation Services Draft Environmental Assessment for Transit Center in Waianae (TMK: 8-6-1: 29). Wahiawa (Portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (Portion of TMK: 9-5-53: 21)

This is a follow-up to our letter (Ref.: C&CoHSTRANSIT95532.RCM) to you dated June 6, 2002, pertaining to the subject matter.

Attached herewith is a copy of the Land Division Engineering Branch comment.

The Department of Land and Natural Resources has no other comment to offer on the subject matter.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0438.

Very truly yours,

Charlene E. Unoki

for DIERDRE S. MAMIYA
Administrator

C: Oahu District Land Office

DEPARTMENT OF LAND AND NATURAL RESOURCES
Land Division
Engineering Branch

COMMENTS

Please note that the proposed three (3) Transit Centers in Waianae, Wahiawa and Mililani are located in Zone D. These are areas where flood hazards are undetermined.

However, if future studies determine that the project sites are within the flood zone, the project must comply with rules and regulations of the National Flood Insurance Program (NFIP) and all applicable County Flood Ordinances. If there are questions regarding the NFIP, please contact the State Coordinator, Mr. Sterling Yong, of the Department of Land and Natural Resources at 587-0248.

In addition, the City and County of Honolulu, Department of Transportation Services is responsible to obtain the necessary water allocation credits from the Board of Water Supply for the State property in Wahiawa.

Signed: Andrew M. Monden
ANDREW M. MONDEN, CHIEF ENGINEER

Date: 6/12/02

N:\WLD\MAKAI\SUZIE\OAHU\TransitCTROahu204.doc

PT 6/02-2327

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

June 6, 2002

LD-NAV
L-2983/3124/3130/3266/3258/3086/3108/3110

C&CoHDTSTRANSIT95532RCM

RECEIVED
2002 JUN 12 A 8:40
DIRECTOR'S OFFICE
CITY & COUNTY OF HONOLULU
TRANSPORTATION SERVICES

Honorable Cheryl D. Soon, Director
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Pre-Consultation – Department of Transportation Services Draft Environmental Assessment for Transit Center in Waianae (TMK: 8-6-1: 29). Wahiawa (Portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (Portion of TMK: 9-5-53: 21)

Thank you for the opportunity to review and comment on the subject matter. A copy of the your letter dated May 9, 2002, summary description and location map covering the proposed project was distributed to the following Department of Land and Natural Resources' Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry & Wildlife
- Division of State Parks
- Division of Boating and Ocean Recreation
- Historic Preservation Division
- Commission on Water Resource Management
- Land Division Engineering Branch
- Land Division Planning and Technical Services
- Oahu District Land Office

Attached herewith is a copy of the Land Division Oahu District Land Office comment.

The Department of Land and Natural Resources has no other comment to offer on the subject matter based on the attached response.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0438.

Very truly yours,

Marlene C. Hoshi

DIERDRE S. MAMIYA
Administrator

C: Oahu District Land Office

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

2002 MAY 28 A 11:12

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532.CMT
Suspense Date: 6/3/02

MEMORANDUM:

FROM: ~~TO:~~
XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

TO: ~~FROM:~~ Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense data, we will assume there are no comments.

( ) We have no comments.

(✓) Comments attached.

Signed:

Date: 5/22/02

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

MEMORANDUM

To: Dierdre Mamiya
Land Administrator

Attn: Nick Vaccaro

From: Steve Lau
Land Agent

Subject: Department of Transportation Services, Draft Environmental Assessment for Transit Centers in Waianae (TMK:8-6-1:29), Wahiawa (portion of TMK:7-4-06:2 and 7-4-06:12), and Mililani (portion of TMK:9-5-053:2)

We have no comment on the proposed project. However, please be advised that for the Wahiawa sites (portion of TMK:7-4-06:2) is an unencumbered lot owned by DLNR.

The abutting property, TMK:7-4-06:12, which is encumbered under GEO 1763 to the Department of Accounting and General Services, Division of Public Works, for the Wahiawa Civic Center.

Both State properties would require Land Board approval for the set aside to the City and County, Department of Transportation Services.

802-O

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

2002 MAY 23 P 1:22

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532.CMT
Suspense Date: 6/3/02

MEMORANDUM:

TO:
XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(V) We have no comments. ( ) Comments attached.

Signed:
Date: 5/22/02

MAY22'02AM10:25BOR RCVD

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532;CHT
Suspense Date: 6/3/02

MEMORANDUM:

TO:
XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
✓ XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: for Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

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

Signed:

Date: 5/23/02

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

May 23, 2002

LD/NAV
A&BWAIKIKI.CHT
NIKETOWN

L-3050/3035
Suspense Date: 6/7/02

MEMORANDUM:

TO:
XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Na Ala Hele Trails
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
✓ XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: for Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Preparation of Environmental Assessment (EA) Covering A&B Waikiki Niketown Development, Island of Oahu, Hawaii
Wilson Okamoto & Associates, Inc. (Earl Matsukawa)

Please review the attached letter and exhibits covering the subject matter and submit your comments (if any) on Division letterhead signed and dated by the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments on or before the suspense date, we will assume there are no comments.

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

Signed:

Date 5/30/02

RECEIVED
2002 JUN -3 A 8:38

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532.CMT
Suspense Date: 6/3/02

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

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

Signed:

Date: 5-30-02

RECEIVED
MAY 29 2002

RECEIVED
2002 MAY 28 A 8:25

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532.CMT
Suspense Date: 6/3/02

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

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

Signed:

Date: 5/29/02

2002 MAY 23 P 12:11

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

May 21, 2002

LD-NAV
L-2938

C&CoHDTSTRANSIT95532.CMT
Suspense Date: 6/3/02

MEMORANDUM:

TO:
XXX Division of Aquatic Resources
✓XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Historic Preservation Division
XXX Commission on Water Resource Management
Land Division Branches of:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Consultation - Department of Transportation Services Draft Environmental Assessment for Transit Centers in Waianae (TMK: 8-6-1: 29), Wahiawa (portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (portion of TMK: 9-5-53: 2)

Please review the attached letter covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date. Should you need more time to review the subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. ( ) Comments attached.

Signed:

Date: DOFAW Administrator 5/22/02

DOFAW will defer comments until the draft EA is made available for review.

PT6/02-2445

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

RECEIVED
02 JUN 19 A8:05
DIRECTOR'S OFFICE
TRANSPORTATION SERVICES

June 17, 2002

LD-NAV
C&CoHDTSTRANSIT95532.RCM2
L-3456

Honorable Cheryl D. Soon, Director
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Pre-Consultation -- Department of Transportation Services Draft Environmental Assessment for Transit Center in Waianae (TMK: 8-6-1: 29), Wahiawa (Portion of TMK: 7-4-6: 2 and 7-4-6: 12), and Mililani (Portion of TMK: 9-5-53: 21)

This is a follow-up to our letter (Ref.: C&CoHSTRANSIT95532.RCM) to you dated June 6, 2002, pertaining to the subject matter.

Attached herewith is a copy of the Land Division Engineering Branch comment.

The Department of Land and Natural Resources has no other comment to offer on the subject matter.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0438.

Very truly yours,

for DIERDRE S. MAMIYA
Administrator

C: Oahu District Land Office

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

CHERYL D. SOON
DIRECTOR

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

August 2, 2002

Dierdre S. Mamiya, Administrator
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Mamiya:

Subject: Draft Environmental Assessment (DEA) for Transit Centers in Waianae (TMK: 8-6-1:29), Wahiawa (TMK: 7-4-6:2 and por.12), and Mililani (TMK: 9-5-53:por. 2).

Thank you for responding with regard to the forthcoming Transit Center DEA. If future studies determine that any or all of the project sites are within a flood zone, the project will comply with the rules and regulations of the National Flood Insurance Program (NFIP) and all applicable County Flood Ordinances. Unless other agreement is reached, the City and County of Honolulu, Department of Transportation Services, or its designate, will obtain the necessary water allocation credits from the Board of Water Supply for the transit center uses to be established on the State property in Wahiawa.

If you have any questions or concerns, please contact James Burke, Project Manager, at 523-4445.

Sincerely,

Cheryl D. Soon

CHERYL D. SOON
Director

cc: Gordon S. Wood, AIA, AM Partners, Inc.

PT 6h2-2365

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 309, KAPOLEI, HAWAII 96707
PHONE: (808) 692-5561 • FAX: 692-5131 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

EDWARD T. "SPIPPA" DIAZ
DEPUTY DIRECTOR

June 12, 2002

RECEIVED
02 JUN 13 P2:51
DIRECTOR'S OFFICE
CITY & CO. OF HONOLULU
TRANSPORTATION SERVICES

MEMORANDUM

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: WILLIAM D. BALFOUR, JR., DIRECTOR

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR TRANSIT CENTERS IN WAIANAE (TMK 8-6-1:29), WAHIAWA (PORTIONS OF TMK 7-4-6:2 AND TMK 7-4-6:12), AND MILILANI (PORTION OF TMK 9-5-53:2)

Thank you for the opportunity to review and comment on the Draft Environmental Assessment relating to Transit Centers in Waianae, Wahiawa and Mililani.

The Department of Parks and Recreation has no comment on the proposed Transit Centers.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

for WILLIAM D. BALFOUR, JR.
Director

WDB:cu (11782)

cc: Mr. Don Griffin, Department of Design and Construction

PT6102-2374

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
File
02-131/cpo

June 12, 2002

Ms. Cheryl D. Soon, Director
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

RECEIVED
02 JUN 14 A 8:01
TRANSPORTATION SERVICES
DIRECTOR'S OFFICE

Dear Ms. Soon:

Subject: Pre-Environmental Assessment (PEA) Consultation
Transit Centers in Waianae, Wahiawa and Mililani
Tax Map Key: 8-6-001:29; 7-4-006:2, 7-4-006:12; and 9-5-053:2

Thank you for the opportunity to review and comment on the subject proposal. The PEA was routed to the various branches of the Environmental Health Administration. We have the following comments.

Clean Water Branch (CWB)

1. The applicant should contact the Army Corps of Engineers to identify whether a federal permit (including a Department of Army permit) is required for this project. A Section 401 Water Quality Certification is required for "Any applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...", pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act");

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following discharges to waters of the State:

   a. Discharge of storm water runoff associated with industrial activities, as define in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi);

   b. Discharge of storm water runoff associated with construction activities that involve the disturbance of five (5) acres or greater, including clearing, grading, and excavation;

   c. Discharge of treated effluent from leaking underground storage tank remedial activities;

   d. Discharge of once through cooling water less than one million gallons per day;

   e. Discharge of hydro-testing water;

   f. Discharge of construction dewatering effluent;

   g. Discharge of treated effluent from petroleum bulk stations and terminals; and

   h. Discharge of treated effluent from well drilling activities.

   Any person requesting to be covered by a NPDES general permit for any of the above activities should file a Notice of Intent with the Department of Health, Clean Water Branch (CWB) at least thirty (30) days prior to commencement of any discharges to State waters;

3. If construction activities involve the disturbance of one acre or greater, including clearing, grading, and excavation, and will take place or extend after March 10, 2003, an NPDES general permit coverage is required for discharges of storm water runoff into State waters; and

4. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters.

If you have any questions, please contact the Clean Water Branch at (808) 586-4309.

Noise, Radiation and Indoor Air Quality (NRIAQ) Branch

All project activities shall comply with the Administrative Rules of the Department of Health, Chapter 11-46, on "Community Noise Control".

If you have any questions, please contact the NRIAQ at (808) 586-4701.

Sincerely,

GARY GILL
Deputy Director
Environmental Health Administration

c: CWB
NRIAQ

PT 6/02-2370 NE

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
ERIC T. HIRANO
LINNEL NISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

June 10, 2002

LOG NO: 30066
DOC NO: 0206EJ03

Ms. Cheryl D. Soon, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Ms. Soon:

SUBJECT: Chapter 6E-8 Historic Preservation Review Pre-Consultation on Draft Environmental Assessment for Transit Centers in Waianae, Wahiawa and Mililani, O'ahu
Lualualei, Wai'anae, Wahiawa, Wahiawa and Waipi'o,'Ewa
TMK: (1) 8-6-001:029, 7-4-006:002 and 9-5-053:002

Thank you for the opportunity to provide comment for the Draft EA for the three transit centers. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received notification of this undertaking from your office on May 23, 2002.

SHPD responded to the Department of Planning and Permitting on the Wai'anae and Wahiawa Community Transit Centers. In both locations we believe that "no historic properties will be affected" by the development of the centers because of past urbanization and grubbing which has altered the land. Copies of our correspondence for these two projects are attached (SHPD Log Nos. 28802/29151).

The Mililani Transit Center is also proposed for an area which has been extensively developed in the recent past and which was previously used for commercial agriculture. Because it is highly unlikely that historic sites would be found, we believe that no historic properties will be affected by the development of the proposed Mililani Transit Center.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

Attachments: SHPD Log 22802, 29151

c. Nick Vaccaro, DLNR Land Division

EJ:amk

RECEIVED
02 JUN 14 P 1:04
DIRECTOR'S OFFICE
TRANSPORTATION SERVICES

PT 5/02-2106

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF

ROBERT AU
GLEN KAJIYAMA
DEPUTY CHIEFS

OUR REFERENCE CS-KP

May 23, 2002

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: LEE D. DONOHUE, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR TRANSIT CENTERS IN WAIANAE (TMK 8-6-1:29), WAHIAWA (PORTIONS OF TMK 7-4-6:2 AND TMK 7-4-6:12), AND MILILANI (PORTION OF TMK 9-5-53:2)

Thank you for the opportunity to review and comment on the subject project.

We believe that there will be minimal impact on the facilities and services of the Honolulu Police Department when the proposed transit centers become operational.

If there are any questions, please call Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

RECEIVED
02 MAY 28 A11:31
DIRECTOR'S OFFICE
TRANSPORTATION SERVICES

LEE D. DONOHUE
Chief of Police

By
KARL GODSEY
Acting Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

PT - 5/02 - 2150

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

May 30, 2002

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: for CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR TRANSIT CENTERS IN WAIANAE (TMK: 8-6-1: 29), WAIHAWA (PORS. OF TMK: 7-4-6: 2 AND TMK: 7-4-6: 12), AND MILILANI (POR. TMK: 9-5-53: 2)

The existing water system is presently adequate to accommodate the proposed transit centers.

The availability of water will be confirmed when the building permit is submitted for our review and approval. When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The proposed project is subject to Board of Water Supply Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

If you have any questions, please contact Joseph Kaakua at 527-6123.

cc: AM Partners, Inc.

PT 5/02 - 2150

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425 • HONOLULU, HAWAII 96819-1869
TELEPHONE: (808) 831-7761 • FAX: (808) 831-7750 • INTERNET: www.co.honolulu.hi.us

May 29, 2002

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
FOR TRANSIT CENTERS IN WAIANAE (TMK 8-6-001: 029),
WAIHAWA (PORTIONS OF TMK 7-4-006: 002 AND TMK 7-4-006: 012),
AND MILILANI (PORTION OF TMK 9-5-053: 002)

We received your letter dated May 9, 2002, regarding the Draft Environmental Assessment for the above-mentioned projects. The Honolulu Fire Department requests that the following be complied with:

1. Maintain fire apparatus access throughout the construction sites for the duration of the project.

2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

ATTILIO K. LEONARDI
Fire Chief

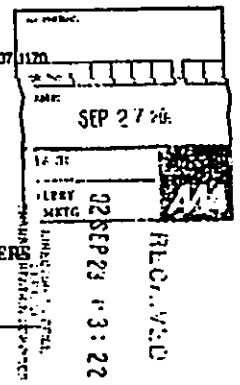
AKL/SK:bh

APPENDIX E
Draft Environmental Assessment Comment Letters and Responses

Longs Drug Stores

September 20, 2002

General Offices: 141 North Civic Drive, P.O. Box 5222, Walnut Creek, California 94596, (925) 937-1170



The City and County of Honolulu
Department of Transportation Services
Attention: Cheryl Soon, Director
650 South King Street, Third Floor
Honolulu, Hawaii 96813

RE: MILILANI AND WAHIAWA COMMUNITY TRANSIT CENTERS
DRAFT ENVIRONMENTAL ASSESSMENTS
LONGS DRUG STORE #254 AND #300
MILILANI AND WAHIAWA, HAWAII

Dear Ms. Soon:

Longs Drug Stores has reviewed the Environmental Assessments referenced above, along with that for the Wai'anae Coast Community Transit Centers. Based on our review, we wanted to clarify our understanding of the proposal, and request a response where required. We must be assured that there will be no unmitigated negative impacts as a part of this proposal.

MILILANI

Longs is concerned that customers using the Transit Center will attempt to utilize it as a park and ride facility. Without adequate parking, the natural tendency will be to utilize Mililani Town Center as a place to park and use the transit facilities. Gordon Wood of AM Partners has indicated that there will be an extensive educational effort, and signage posted to advise residents that there are no park and ride facilities at this location. If the residents want to park and ride, they will need to use the facilities at Mililani Mauka several miles away. We are concerned that enforcement will end up costing the center money if the City is not proactive about the "no shopping center parking" policy. What role will the City have in the event that its position that residents will not use the shopping center is incorrect? In that event, it is unreasonable to burden the private property owner with the expense and effort to patrol its parking area due to an unrelated use. Additionally, please advise as to the extent of the educational efforts and the signage that will be posted in this area in order to "protect" the shopping center.

Longs' understanding of the loss of parking in the shopping center, based on your letter to Castle & Cooke dated May 9, 2002, is that the parking will be reduced by no more than five stalls to accommodate the structural system for the facility.

WAHIAWA

As Longs' is not contiguous with the subject property, we do not have the same level of concern as Mililani. Will the educational efforts be the same level as those for the Mililani center?

Additionally, on page 6 you indicate, "Adequate park and ride facilities currently are provided at the Wahiawa Armory site; there is need to augment or duplicate those facilities." Based on this statement, it appears that the park and ride facility augmentation or duplication may be a requirement of this project. Please provide information with regard to: 1) where these facilities will be, 2) when they will be constructed, and 3) whether these additional parking facilities are a requirement of the Transit Center Project. Additionally, please provide assurance that the existing 90°, unmetered parking on Center Street will remain a viable option for residents who must park in this area, who may been displaced by this project if they are currently parking on the subject property.

We look forward to the Final Environmental Assessment in which the above concerns are addressed with adequate specificity to relieve our concerns regarding the T aspects, Longs also understands the benefit of providing these facilities adjacent to our stores. As a successful retailer in Hawaii, we want to make sure that our ability to serve the local residents is not impaired in any way, so we can continue to be an attractive retail option for the residents in these communities.

Should you have any questions or comments regarding the above please don't hesitate to contact me at (925) 210-6794.

Yours very truly,

LONGS DRUG STORES CALIFORNIA, INC.

Gary Veasy
Director of Design

GWV/jfp

cc: Mike Raphel
Gerald Saito
Nolan Karioka
Steven Harris, #254
Dennis Akimoto, #300
Jean Ulep, Property Management Supervisor, Castle & Cooke
Gordon Wood, AM Partners
State of Hawaii Department of Health
File

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

JEREMY HARRIS
Mayor

CHERYL D. SOON
Director

GEORGE "KEALI'I" MYERS, JR.
Deputy Director

June 24, 2003

Mr. Gary Veasy
Director of Design
Longs Drugs Stores California, Inc.
141 North Civic Drive
P.O. Box 5222
Walnut Creek, California 94596

Dear Mr. Veasy:

Subject: Waianae Coast Community Transit Center
Draft Environmental Assessment (DEA) Tax Map Key: 8-6-1:29

Thank you for your comments dated September 20, 2002, regarding the Draft Environmental Assessment (DEA) of the Waianae Coast Community Transit Center. All comments timely received will be included in the Final Environmental Assessment to be submitted to Hawaii's Office of Environmental Quality Control.

We thank you for appreciating the benefits that the proposed transit center will bring to the adjacent retailers of the area, including the Longs Drugs Store in Waianae. We anticipate the proposed Transit Center will prove a valuable asset to Waianae, and will help to assure the community's long-term economic and social vitality. We value your presence in Hawaii and we want to ensure the ability of area retailers to serve the local community is enhanced by the proposed project.

The Final Environmental Assessment (FEA) will be amended to address the concerns and comments discussed in your letter. Should you have any additional questions or comments, please don't hesitate to contact James Burke of my staff, at 523-4445.

Sincerely,

CHERYL D. SOON
Director

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P O BOX 621
HONOLULU, HAWAII 96809

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

September 13, 2002

LD-NAV
C&CoHDTSTRANSITWAIANAE.RCH
L-1358 (1)/1467/1510/1667/1586/1555

AM Partners, Inc.
Becky L. Hayashida
1164 Bishop Street, Suite 1000
Honolulu, Hawaii 96813

Dear Ms. Hayashida:

Subject: City and County of Honolulu Department of Transportation Services Draft Environmental Assessment (DEA) Covering the WAIANAE COAST COMMUNITY TRANSIT CENTER (August 2002), Island of Oahu, Hawaii Consultant: AM Partners, Inc. - Project No. A00096.20

Thank you for distributing one (1) copy of the subject Draft Environmental Assessment (DEA) to the Department of Land and Natural Resources' (DLNR) Land Division.

The DLNR Land Division made available the one (1) copy of the DEA covering the proposed project to the following DLNR Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry & Wildlife
- Division of State Parks
- Division of Boating and Ocean Recreation
- Commission on Water Resource Management
- Land Division Planning and Technical Services
- Land Division Engineering Branch
- Oahu District Land Office

Based on the attached responses the Department of Land and Natural Resources has no comment to offer on the subject matter. If the DLNR Land Division receives additional comments, they will be forwarded to your office at that time.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0438.

Very truly yours,

Charlene E. Unoki
for DIERDRE S. MAMIYA
Administrator

C: Oahu District Land Office

B02-0-F

RECEIVED
2002 SEP -3 P 3:49

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

August 27, 2002

LD-NAV
L-1358 (1)

C&CoHDTSTRANSITWAIANAE.CMT
Suspense Date: 9/11/02

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
✓XXX Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
Land Division Branches:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: City and County of Honolulu Department of Transportation Services Draft Environmental Assessment (DEA) Covering the WAIANAE COAST COMMUNITY TRANSIT CENTER (AUGUST 2002)
Consultant: AM Partners, Inc. - Project No. A0096.20

Please review the DEA covering the subject matter and submit your written comment and recommendation (if any) on Division letterhead signed and dated on or before the suspense date.

NOTE: One (1) Copy of the subject DEA is available for your review in the Land Division Office, room 220.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at ext.: 7-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

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

Signed:

Date: 9/3/02

RECEIVED
2002 SEP -4 P 3:53

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

August 27, 2002

LD-NAV
L-1358 (1)

C&CoHDTSTRANSITWAIANAE.CMT
Suspense Date: 9/11/02

MEMORANDUM:

TO: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
Land Division Branches:
XXX Planning and Technical Services
✓XXX Engineering Branch
XXX Oahu District Land Office

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Land Division

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

Signed: Eric T. Yuasa

Date: 9/4/02

RECEIVED
2002 SEP -9

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P O BOX 621
HONOLULU, HAWAII 96809

August 27, 2002

LD-NAV
L-1358 (1)

C&CoHDTSTRANSITWAIANAE.CHT
Suspense Date: 9/11/02

MEMORANDUM:

FROM: XXX Division of Aquatic Resources
XXX Division of Forestry & Wildlife
XXX Division of State Parks
XXX Division of Boating and Ocean Recreation
XXX Commission on Water Resource Management
Land Division Branches:
XXX Planning and Technical Services
XXX Engineering Branch
XXX Oahu District Land Office

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

Signed:

Date: 9/4/02

RECEIVED
2002 AUG 30 P 3:45

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P O BOX 621
HONOLULU, HAWAII 96809

August 27, 2002

LD-NAV
L-1358 (1)

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Suspense Date: 9/11/02

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