ENVIRONMENTAL IMPACT STATEMENT
for
HAWAII KAI MARINA ZONING

Hawaii Kai, Honolulu District, Island of Oahu, Hawaii

September 1985

SUBMITTED PURSUANT TO CHAPTER 343, HAWAII REVISED STATUTES, ENVIRONMENTAL IMPACT STATEMENT REGULATIONS

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THE KAISER DEVELOPMENT COMPANY

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SUMMARY

I. SUMMARY

Action: Chapter 343 applicant action for zoning change

Project Name: Hawaii Kai Marina Zoning

Accepting Authority: Department of Land Utilization, City & County of Honolulu

Project Location: All portions of the project are located within the Master planned community of Hawaii Kai in the Honolulu District of Oahu. The project sites are bounded by Kaluanui Ridge, Hawaii Kai Drive, Kuapa Pond and Lunalilo Home Road. All parcels are currently vacant and unused.

Tax Map Key:

	Parcels	Acreage	Tax Map Key
1.	Kaluanui 1	22.925	3-9-08: por. of 13
2.	Kaluanui 2 & 3	13.859	3-9-08: por. of 13
3.	Marina 11 (A)	8.727	3-9-08: por. of 13
4.	Marina 11 (B)	8.427	3-9-08: por. of 13
5.	Marina 7E (A)	20.155	3-9-08: 16, por. or 13
6.	Marina 7E,(B)	14.388	3-9-08: por. of 13
7.	Marina 8	9.305	3-9-09: por. of 13

Zoning:

	Parcels	Existing Zoning	Requested Zoning	Current D.P. Designation
1.	Kaluanui 1	AG/P-1	A-2	MD (150')
2.	Kaluanui 2&3	AG/P-1	A-2	MD (60')
3.	Marina 11 (A)	R-6	A-2	MD (60')
4.	Marina 11 (B)	P-1	A-1	LD (30')
5.	Marina 7E (A)	R-6	A-1	LD (30')
6.	Marina 7E (B)	R-6	A-2	MD (60')
7.	Marina 8	P-1	A-1	LD (30')

Proposing Applicant: Kaiser Development Company

Environmental Consultant: Environmental Communications, Inc.

Project Description: The applicant proposes to rezone approximately 97 acres to either A-1 Low-Density Apartment or A-2 Medium-Density Apartment from existing R-6, P-1 and AG-1 zoning districts in accordance with and in implementation of City and County land use policy as set forth in the East Honolulu Development Plan land use designations for the areas. The estimated number of apartment units to be constructed over a period of

six to seven years from approval of the zoning is 2,400 with the precise sequencing dependent upon market conditions. Of this number, about 470 will be low-density units (A-1 zoning) and about 1,930 will be medium-density units (A-2 zoning). The estimated population increase of 5,270 that will be generated by the development fits within the growth allocation for East Honolulu established in the Oahu General Plan and the East Honolulu Development Plan.

Probable Environmental Impacts:

1. Environmental impacts (short-term) will include dust, noise, and traffic disruptions due to the grading and construction on the project site. These impacts will be mitigated to a large extent by adhering to the Grading Ordinance, air quality standards, and construction noise standards and regulations.

2. The project will commit the sites to urban use therefore, all other uses will probably be foreclosed. However, the land is planned and committed for such urban use in the East Honolulu Development Plan.

3. The existing infrastructure, e.g. telephone, electricity, sewerage systems and internal roads, is available or will be made available to adequately accomodate the proposed project. Air and noise quality will be impacted due to increases in vehicular traffic, however, rideshare measures proposed by the developer should minimize these impacts.

II

PROJECT DESCRIPTION

II. PROJECT DESCRIPTION AND STATEMENT OF OBJECTIVES

A. Project Location

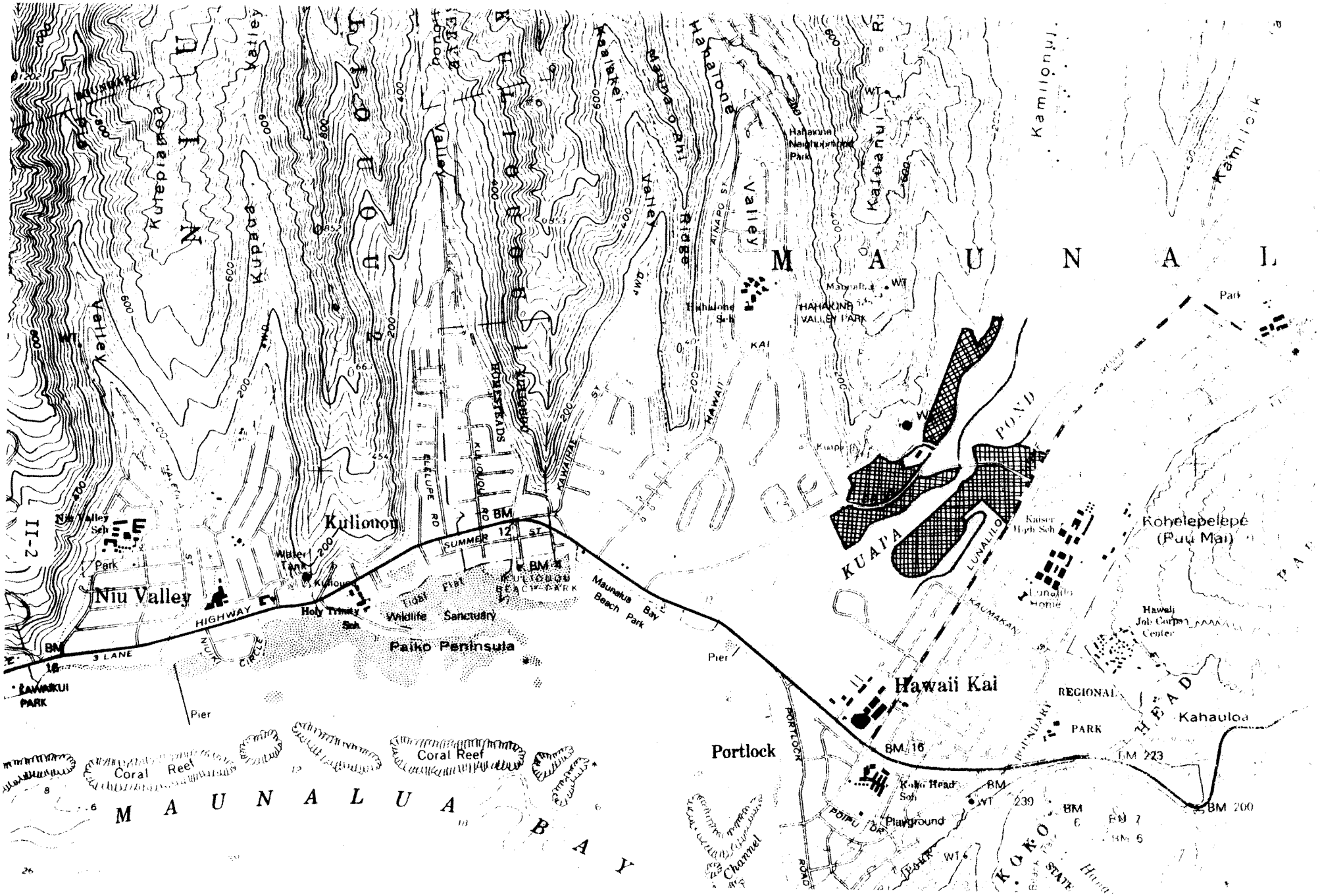
The project is located within the master planned community of Hawaii Kai, Honolulu District Oahu, Hawaii (Figure 1). Kuli'ou'ou valley is located to the west and Koko Head crater lies east of the project area which is in the west or "marina" side of Hawaii Kai. Kuapa Pond, also referred to as the Hawaii Kai Marina, is a central feature of the project area.

B. Project Description

The project involves rezoning of approximately 97 acres to either A-1 Low-Density Apartment or A-2 Medium-Density Apartment from existing R-6, P-1 and Ag-1 zoning districts in accordance with the East Honolulu Development Plan Land Use Designations for the areas. The seven separate parcels, which constitute the total project, are identified in Figure 2. The estimated number of apartment units to be constructed over a period of six to seven years from approval of the zoning is 2,400. Of this number, about 470 will be low-density units (A-1 zoning) and about 1,930 will be medium-density units (A-2 zoning). The estimated population increase of 5,270 that will be generated by the development fits well within the growth allocation for East Honolulu established in the Oahu General Plan and the East Honolulu Development Plan. Specific project densities and development constraints, are discussed, when each tract is profiled and are sumarized in Table 1.

1. Marina 7E (A) is the peninsula of land in the middle of the marina across from the Esplanade and Kaimala Marina. A-1 zoning with a 30' height limit is requested for this parcel.

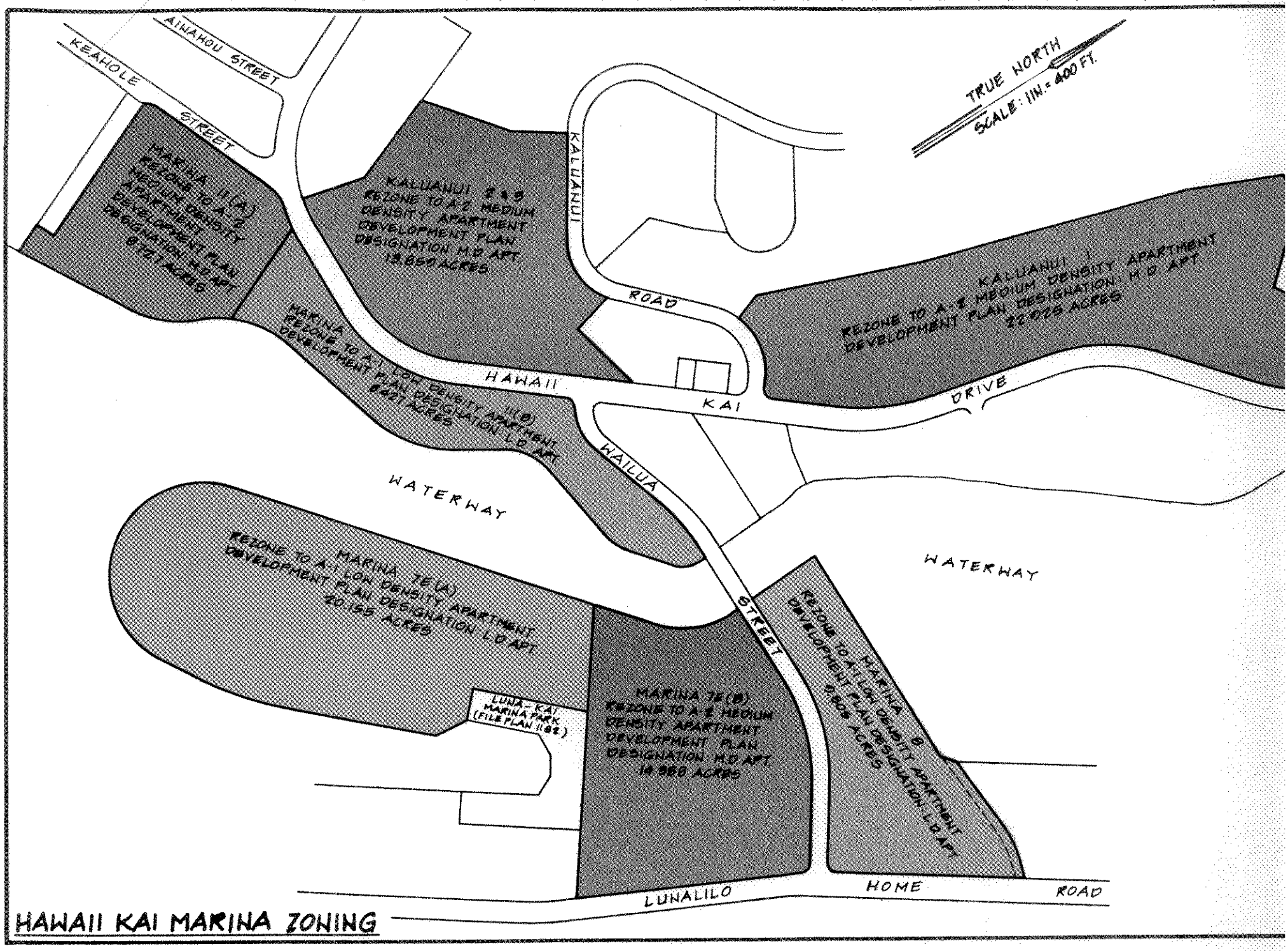
   Conceptual plans show approximately 250 units on the 20.16-acre site. Proposed development will consist of two-story buildings with surface parking.



Marina Zoning

Project Location

FIGURE 1



HAWAII KAI MARINA ZONING

TABLE 1

HAWAII KAI MARINA ZONING PARCELS
SUMMARY OF DEVELOPMENT DATA 1/

	Tax Map Key	Gross Acres	1984 East Hon. D.P. Land Use Desig.	Existing Zoning	Proposed Zoning	Proposed Building Height	Proposed No. of Units	Proposed Density (Units/Act.)	Propos No. o Parkin Stall
Marina 7-E(A)	3-9-08:16	20.155	LD	R-6	A-1	30'	250	12.4	55
Marina 7-E(B)	3-9-08:16	14.388	MD	R-6	A-2	40'	260	18.1	52
Marina 8	3-9-08:por. of 13	9.305	LD	P-1	A-1	30'	120	12.9	25
Marina 11(A)	3-9-08:por. of 13	8.727	MD	R-6	A-2	60'	300	34.4	65
Marina 11(B)	3-9-08:por. of 13	8.427	LD	P-1	A-1	30'	100	11.9	21
Kaluanui 2 & 3	3-9-08:por. of 13	13.859	MD	AG-1/P-1	A-2	30'/60'	350	25.2	73
Kaluanui 1	3-9-08:por. of 13	22.925	MD	AG-1/P-1	A-2	150'	1,020	44.5	2,15
TOTAL		97.786					2,400	24.54	5,08

1/ Date is based upon conceptual plans and is subject to reasonable modification.

2/ Based upon two stalls per unit plus parking for guests.

This parcel is land created by filling in a portion of the original Kuapa Pond. The existing ground varies from 6 to 10 ft. (MSL), except where it slopes down to approximately 3 ft. (MSL) adjacent to the existing marina wall. There is currently a large amount of material stockpiled on the site from dredging that was completed in 1982. The stockpile varies from 7 to 10 ft. in height above the ground and will be removed prior to development of the parcel. All required utilities are available within the adjacent streets.

2. Marina 7E (B) is that portion of land on the makai side of Wailua Street and the west side of Lunalilo Home Road. A-2 zoning is requested for this parcel. Although the East Honolulu Development Plan would allow development to a 60 ft. height, applicant proposes to limit development to 40 ft. due to community concerns. Conceptual plans show approximately 260 units on the 14.39-acre site. The proposed development will consist of three-story buildings with surface parking.

This parcel is almost entirely land created by filling in a portion of the original Kuapa Pond. The existing ground varies from 6 to 10 ft. (MSL), except where it slopes down to approximately 3 ft. (MSL) adjacent to the existing marina wall. There is currently a large amount of material stockpiled on the site from dredging that was completed in 1982. The stockpile varies from 7 to 10 ft. in height above the ground and will be removed prior to development of the parcel. All required utilities are available within the adjacent streets. A large open unlined drainage ditch conveying storm runoff waters from Lunalilo Home Road to the marina will probably be realigned and improved with underground concrete pipes and/or box culverts as part of the on-site work.

3. Marina 8 is located on the mauka side of Wailua Street and the west side of Lunalilo Home Road. A-1 zoning with a 30 ft. height limit is requested for this parcel. Conceptual plans show approximately 120 units on the 9.3-acre site. Proposed development will consist of two-story buildings with surface parking.

The parcel is nearly flat with an elevation ranging from 10 ft. (MSL) near the existing roadways to 2 ft. (MSL) near the shoreline. A marina wall will have to be constructed along the shoreline when the area is developed. This will require some excavation/dredging adjacent to the boundary to construct the shoreline protection structure (i.e., marina wall). Some fill will be required behind the shoreline structure to raise the existing ground level up above the potential flood level to an elevation of 6+ ft. (MSL). There is also a large existing sewer force main line that runs through the parcel, portions of which may have to be relocated when the area is developed. All required utilities are available within the adjacent streets.

4. Marina 11 (A) is the portion of land on the mauka side of the Kuapa Kai shopping center. A-2 zoning, with a 60 ft. height limit is requested for this parcel. Conceptual plans show approximately 300 units on the 8.727-acre parcel. Proposed development will consist of six-story buildings with parking structures.

This parcel is amost entirely land created by filling in a portion of the original Kuapa Pond. The existing ground varies from 6 to 9 ft. (MSL), except where it slopes down to an elevation of approximately 3 ft. (MSL) adjacent to the existing marina wall. All required utilities are available within the adjacent streets.

5. Marina 11 (B) is the narrow portion of land on the east side of Hawaii Kai Drive from the mauka boundary of Marina 11 (A) to the Wailua Street bridge. A-1 zoning with a 30 ft. height limit is requested for this parcel. Conceptual plans show approximately 100 units on the 8.427-acre parcel. Proposed development will consist of two-story buildings with surface parking.

   This parcel is also almost entirely land created by filling in a portion of the original Kuapa Pond. The existing ground varies from 6 to 9 ft. (MSL), except where it slopes down to an elevation of approximately 3 ft. (MSL) adjacent to the existing marina wall. All required utilities are available within the adjacent streets. There are two existing drain lines under Hawaii Kai Drive that discharge storm runoff through the parcel via two unlined ditches. When the area is developed, it is anticipated that pipes and/or box culverts would be installed to eliminate the ditches.

6. Kaluanui 2 and 3 is located on the mauka side of Hawaii Kai Drive and is makai of the Post Office. A-2 zoning, with a 60 ft. height limit, is requested for this parcel. Conceptual plans show approximately 350 units on the 13.86-acre site. Proposed development will vary from six-story buildings with parking structures at the back of the parcel to two and/or three-story buildings with surface parking adjacent to Hawaii Kai Drive.

   The front of the parcel is nearly flat, ranging from 10 to 20 ft. (MSL). The back of the parcel begins to slope up as the end of Mariner's Ridge is encountered. A permanent system to divert storm runoff from Mariner's Ridge will have to be installed to convey the runoff to existing drainage facilities in Hawaii Kai Drive. All other utilities are available within Hawaii Kai Drive.

7. Kaluanui 1 is located across Hawaii Kai Drive from the Anchorage along the eastern slope of Mariner's Ridge. A-2 zoning with a 150 ft. height limit is requested for this parcel. Conceptual plans show approximately 1,020 units on the 22.92-acre site. The proposed development will consist of 15-story buildings with parking structures located behind the buildings up against Mariners Ridge.

   Except for the back of the parcel (west and north sides) where the eastern slope of Mariner's Ridge is encountered, most of the parcel is nearly flat with an elevation ranging from 10 to 20 ft. (MSL). All required utilities are available in the adjacent Hawaii Kai Drive. There is a temporary silt basin at the northern end of the parcel to handle the storm runoff that flows down to the parcel from the large gully at the northern end. A storm water diversion system will also be installed along the western boundary along the bottom of Mariner's Ridge.

C. Statement of Objectives

It is Kaiser's intent to build and market quality apartment housing units in keeping with the Hawaii Kai master planned community. Open space, generous setbacks, lush landscaping marina orientation, quality architecture and construction, and ample off-street parking, are all aspects of the development that are characteristic of Hawaii Kai. These elements will be maintained in the proposed development.

A comprehensive transportation management program is being recommended by the developer in connection with the zoning. The program, featuring among other things, a number of rideshare measures, supports and implements important Honolulu General Plan Transportation Policies.

D. Phasing and Funding

1. Phasing

It is anticipated that the proposed project will take six to seven years to complete from approval of zoning, depending on market acceptance and economic conditions. The sequence of development is not yet established and must remain somewhat flexible to meet market demand. It is anticipated, however, that each parcel will be developed in phases. Development may also alternate from the first phase of one parcel to a phase of another parcel before complete development of any single parcel. This will allow flexibility to shift from low-rise to mid-rise development, at different price levels as the market demand varies.

2. Funding

The applicant/developer, as master developer of the project, will secure private funding for applicable portions of the project.

III

THE AFFECTED ENVIRONMENT

III. THE AFFECTED ENVIRONMENT

A. Geographical Characteristics

1. Topography

The seven individual parcels range from filled lands recovered from the dredging and filling of Kuapa Pond, to the hard ground below Kaluanui Ridge (also known as Mariner's Ridge). The sites adjacent to the Marina are generally level, while the Kaluanui 1, 2, & 3 parcels have varying topography ranging from 20' to 80'. All the higher structures (maximum 150 feet) are to be built at the base of Kaluanui Ridge with a minimum of cutting and grading. This serves to greatly minimize any impact upon the views of existing residents. This concept was successfully used in the development of the Mauna Luan and the other medium-density high rise buildings located against the other side of Kaluanui Ridge. The proposed buildings will be smaller (150 feet rather than 200 feet) than the Mauna Luan. The sites are vacant at the present time and are serviced by existing utilities and interior road systems.

2. Soils

Soils within the project area consists of fill land, mixed and Koko silt loam. The fill land, mixed consists of areas filled with material dredged from the pond or hauled from nearby areas. The Koko silt loam is generally within 21 to 6 percent slopes. Permeability is moderate. Runoff is slow, and the erosion hazard is slight. The available water capacity is 2.1 inches per foot of soil. Lualualei type extremely stony clay is the predominant soil on the upper slopes.

3. Climate

The climate is near constant with prevailing trade winds from the East-Northeast and typical temperature ranges from 65-86 degrees Fahrenheit. Annual rainfall is approximately 20-35 inches per year.

B. Hydrological Characteristics

1. Surface Runoff

Approximately 80% of the proposed devlopment area is underlain by mixed fill, which was primarily derived from dredging the original Kuapa Pond, an ancient Hawaiian fish pond. The material is thus, primarily of alluvium origin which is generally only moderately permeable. The remaining approximately 20% of the development area consists of Koko soil, a fairly permeable material. The project site is presently covered with a varying amount of grasses and brush, principally California grass and Haole Koa. The mean annual rainfall in this area is approximately 35 in. (DOWALD, 1981). The proposed development involves use of a considerable length of marina shoreline. A large area on the eastern portion of the proposed development, across from Kaiser High School, consists of berms constructed around its periphery serving as the settling/dewatering basin for part of the dredged material removed from the 1982 dredging of Kuapa Pond.

Inasmuch as there is no water quality information for storm water runoff from the predeveloped (1985) project area itself, nitrogen and phosphorus levels of 1.10 mg/L and 0.11 mg/L, respectively, were used for the present (1985) conditions. These values, which were based on information published by Loehr (1972), were derived from nitrogen outputs of 3 lb/acre-yr and phosphorus outputs of one order of magnitude less; an annual rainfall of 35-in.; and a rainfall-runoff coefficient of 0.3.

Representative suspended solids values in storm water runoff from the predeveloped (1985) project area are again difficult to determine, inasmuch as it is commonly presumed, by mainly indirect methods, that the majority of the annual suspended solid load is carried by the heavy storm water runoff events which tend to occur on an infrequent basis. For the present study, the concentration

of suspended solids was based on composite measured and estimated suspended solids load per unit area from various Oahu streams, including those out of the entire Kaneohe Bay Drainage Basin, as reported by Jones et al. (1971). Following this reasoning, the suspended solids concentration value for predeveloped conditions for comparative purposes was set at 1,500 mg/L.

Quality data for urban storm water (post-development conditions) is sparse, both locally and nationally, Loehr (1974) compiled urban storm water runoff quality data collected from thoughout the United States, as well as from a few international locations. As expected, the data are diverse. Locally, Fujiwara (1973) reported urban storm water quality data collected from storm drains in different drainage areas of Honolulu, and these results were used to stimulate post-development runoff quality, which were, respectively, 0.60, 0.57, and 250 mg/L, for nitrogen, phosphorus, and suspended solids. Attention is likewise drawn to the heavy metal content in residential runoff, especially with respect to iron, chronium, copper, lead, and zinc.

Drainage from the existing urban areas presently flow into Kuapa Pond via City and County systems. Capacity is adequate to accommodate increased flows from the proposed project.

2. Flood Hazards

The project sites lie outside of the 100-year flood boundary according to the Floodway flood boundary map and has been listed as an area of undetermined, but possible, flood hazards by the FIRM flood insurance rate map.

3. Tsunami Inundation

The project sites do not lie within Civil Defense Tsunami Inundation Zones.

C. Biological Characteristics

1. Flora

The predominant vegetation in the project area consist of kiawe, koa haole, weedy species and exotic plants that are common on the ridge crest, slopes and undeveloped areas around the marina. Grasses are especially dense in areas that have been bulldozed or where silt has recently been stockpiled. The vegetation reflects the semi arid climatic conditions of the area. There are no endangered species located on any of the project sites.

2. Fauna

The urban uses of adjacent areas limit the potential of wildlife habitats for endangered birds; however, the shallow, gentle sloping intertidal shoreline areas still provide shelter, resting and feeding areas for migratory shorebirds and other exotic birds. Certain waterbirds still utilize the marina despite the presence and activities of man, such as ducks observed in the quiet residential areas of the marina, migratory shorebirds observed in vacant lots, and Golden Plovers and Aukuu observed in the upper basin.

The presence of endemic Hawaiian wildlife is limited in the project areas due to the extensiveness of land alterations. Rodents, mongoose and feral dogs and cats may be found in the inland areas along with the possibility of the Hawaiian Bat and owl in the upper ridges.

D. Historical and Archaeological Characteristics

1. Historical Summary

The first known sighting of Maunalua Bay by Europeans is recorded by Nathaniel Portlock in 1786 when he and Captain George

Dixon went ashore near Point Dick (Koko Head). Later they rowed along the coastline in search of a spring from which to obtain water and landed "amidst a vast number of the inhabitants" in the general vicinity of Kuapa Pond (Portlock as quoted in Takemoto et al. 1975). Subsequent writings by Mathison (1825) and Chamberlain (1826, 1828) in the early 1800s also mention the inhabitants of the area and villages that are located near Kuapa Pond. Davis (1985) believes that the village mentioned by Mathison, which contained 100 houses, was the same village research area. The villages mentioned by Chamberlain, however, were thought by Davis (1985), to be located on a causeway separating the pond from the sea, and inland at the head of Kuapa Pond on the eastern shore near Pahua Heiau.

As noted by Davis (1985), the years between 1825 and 1860 are also of importance historically, since Maunalua was an anchorage for whaling ships and inter-island traders. It was here that they provisioned their boats with sweet potatoes.

A number of interesting references to the Maunalua area and Kuapa Fishpond are also found in traditional legends and historical literature. These references are addressed in both Takemoto et al. (1975) and Kelly et al (1984).

2. Archaeological Reconnaissance Area

The archaeological reconnaissance area was limited to the portion of the project that is hard ground, as apposed to lands created by the developer. The field work was conducted in the Maunalua area, District of Kona, Island of Oahu, Hawaii in portions of Royal Patent No. 4475 and in portions of Land Commission Award 7713, Apana 30 (TMK 01:03:09:08). The reconnaissance area, situated on the eastern slopes and adjacent flatlands of Kaluanui Ridge and Kamilonui Valley, contained ca. 36 acres. Kaluanui 1 is bounded

by Hawaii Kai Drive on the east, Kaluanui Road on the south, and Kaluanui Ridge on the north and west. Kaluanui 2/3 is bounded by Hawaii Kai Drive on the south, Kaluanui Road on the northeast, and by the slopes of Kaluanui Ridge on the north .

The project area did not contain any sites listed on either the National Register of Historic Places or the Hawaii Register of Historic Places. During the field survey, nine archaeological sites and six possible sites were identified, mapped, and recorded (Table 2). One of the sites is an historic habitation area; the remaining sites are inferred to reflect pre/proto historic utilization of the area. Three of these are caves, two are platforms (one associated with a free standing wall), one is a large terraced platform with associated petroglyphs, one is a series of low terraces which may be a complex of modified natural stone cavities. Six additional natural stone cavities were also identified, though it is uncertain whether these contain cultural material.

E. Existing Traffic Conditions

Travel in the East Honolulu corridor is served by a single major traffic artery, the Kalanianaole Highway. Kalanianaole Highway connects the East Honolulu residential communities to Interstate Route H-1 and the major Honolulu employment centers, and to Windward Oahu. The residential nature of the area results in a heavy directional flow of commuter travel in the Ewa and Koko Head directions on Kalanianaole Highway during the morning and evening peak travel periods, respectively.

Kalanianaole Highway is a divided highway in a 120-foot wide right-of-way from the H-1 Freeway to Kirkwood Street. The divided section has three lanes in each direction Ewa of West Hind Drive, and three Ewa and two Koko Head direction lanes between West Hind Drive and Kirkwood Street. Between Kirkwood Street and

Table 2. Classification and Cross Reference of Sites

Field No.	State No. 50-80-15-	Kaluanui Area	Site Type	Site Condition	Abbreviated Recommendation
0001	2900	2/3	Terraced Platform	Dense vegetation Excellent integrity	Test and Preserve
0002	0042?[1]	2/3	Terraces	Dense vegetation Poor condition	Test and Evaluate
0003	2902[2]	2/3	Cave	Minimal disturbance	Total Excavation
0004	2905	2/3	Natural Cavity	Undisturbed	Total Excavation
0005	2903	2/3	Wall and Platform	Minimal disturbance	Test and Excavate
0006	2904	2/3	Platform	Minimal disturbance	Test and Excavate
0007	2906	1	Historic Habitation	Abandoned and collapsed	No Further Work
0008	2908[3]	1	Cave	Excavated -- artifacts in backfill	Total Excavation
0009	2907	1	Walled Cave and Platform	Minor cultural disturbance	Total Excavation
0010	2901	1	Dirt-filled Natural Cavity	Cultural disturbance	Total Excavation
A,B,C, D,E	none	1, 2/3	Natural Cavity	Undisturbed	Locate and Sample

[1] McAllister (1971) site number
[2] Bayard (1969) Site No. O-16 Feature E
[3] University of Hawaii Site No. O-5

Hawaii Kai, the roadway is a four-lane undivided highway, with left-turn lanes provided only at East Halemaumau, Hawaii Kai Drive, Keahole Street and Lunalilo Home Road.

Current roadway facilities and public transit services along Kalanianaole Highway are intensely used throughout the morning and evening peak travel periods. Travel conditions on Kalanianaole Highway, as evidenced by travel speeds recorded in studies by the Oahu Metropolitan Planning Organization, are similar to those for other Oahu travel corridors.

Peak direction travel on Kalanianaole Highway by Hawaii Kai residents and visitors amount to 2,800 and 2,200 vehicle trips during the morning and evening peak traffic hours, respectively. Hawaii Kai trips comprise slightly over one-half of the peak hour traffic at the Ewa end of Kalanianaole Highway. The Hawaii Kai trips inbound on Kalanianaole Highway during the morning peak hour, both by automobile and public transit, are summarized in the following Table 3.

TABLE 3

HAWAII KAI TRIPS INBOUND ON KALANIANAOLE HIGHWAY
Morning Peak Hour at Kawaihae Street

Travel Mode	Vehicles	Persons	Percent of Total Persons
Auto Drivers	2,800	2,800	54.4
Auto Passengers	0	1,400	27.1
Subtotal	2,800	4,200	81.5
Express Bus	12	570	11.1
Local Bus	7	380	7.4
Subtotal	19	950	18.5
TOTAL	2,819	5,150	100.0

The high automobile occupancy (average 1.5 persons per vehicle) largely reflects parents driving their children to school enroute to work. A portion of local bus passengers are also school related-destined principally to Niu Intermediate School or Holy Trinity School.

In the evening peak traffic period, the return trips to Hawaii Kai are spread over a longer period with a resultant lower peak one-hour volume.

Kalanianaole Highway peak direction traffic flow was measured by 15-minute time increments for the highest volume location at Ainakoa Avenue. During the morning peak commute period, inbound traffic

flow reaches volumes of 1,050 to 1,200 vehicles each 15-minute period between 6:30 and 8:30 a.m. During this period, traffic movement along Kalanianaole Highway is limited by the capacity of the Kalanianaole/Kalaniiki/Waieli Street intersection at Kalani High School, which produces the long traffic queues evident on school days.

Peak direction traffic volumes during the morning peak hour have reached the present roadway's capacity at the traffic "bottleneck" near Kalani High School at the Ewa end of Kalanianaole Highway. During the evening peak hour, the peak direction traffic volumes are approaching the capacity at several locations along the four-lane section in the Niu Valley-Kuliouou areas. These constraints have encouraged changes in corridor travel characteristics to accommodate recent travel increases. Travellers during peak periods have changed their time of departure, thus lengthening the time periods which experience heavy (peak) traffic volumes, and have increased use of public transit and ridesharing. In fact, Hawaii Kai and East Honolulu usage of public transit is among the highest on Oahu, with nearly 20 percent of the morning peak hour, peak direction trips made by bus. This reflects the success of the Hawaii Kai express bus services.

To permit more efficient use of the Kalanianaole Highway facility, the Hawaii Department of Transportation (State DOT) has implemented a reversible lane operation between Hawaii Kai and Interstate H-1 during the morning peak hour. Use of the reversible lane between Aina Haina and Interstate H-1 is restricted to high occupancy vehicles (HOV) to encourage use of buses and carpooling.

The State DOT plans to increase the capacity of Kalanianaole Highway by widening the roadway to provide two additional lanes within the median. These lanes will be reserved for HOVs, with both lanes operating inbound towards Honolulu during the morning

peak travel period and outbound during the evening peak period. Engineering design is currently underway on the Kalanianaole Highway project, with completion of construction expected in the mid-1990s.

The principal problems observed in Hawaii Kai during the morning peak is the large volume of makai direction commuter traffic which follows a route using Lunalilo Home Road, Wailua Street, Hawaii Kai Drive and Keahole Street. This route results in an Ewa-direction right-turn movements of almost 1,200 vehicles from Lunalilo Home Road to Wailua Street, and a similar number of left turns at the Hawaii Kai Drive intersections with Wailua and Keahole Streets. The left-turn volumes are approaching the capacity of the two Hawaii Kai Drive intersections, given the present physical layout and traffic controls, since the left-turn movement is made from a single lane.

The return movement in the evening peak hour results in right turn volumes of more than 900 vehicles at the Hawaii Kai Drive intersections with Keahole and Wailua Streets. The lower volume and the fewer conflicts with the right turn movement enable the evening movement to be made with less disruption. The afternoon return movement does result in a heavy mauka-bound left turn (830 vehicles) from Wailua Street to Lunalilo Home Road. However, two left-turn lanes are provided to accommodate this movement.

F. Ambient Air Quality

There are no ambient air quality monitoring stations within the immediate vicinity of Hawaii Kai. Under prevailing wind conditions there is no industrial activity upwind for thousands of miles and it is reasonable to assume that present air quality is quite good. The only significant sources of man-made air pollution in the area are motor vehicles travelling within the Hawaii Kai development or on nearby Kalanianaole Highway. There is no agricultural activity requiring open field burning on east Oahu.

Natural air pollutant producers which could affect Hawaii Kai air quality include the ocean (sea spray), plants (aero-allergens), dust, and perhaps a distant volcanic eruption on the Island of Hawaii. Concentrations of air pollutants from these kinds of sources should be fairly uniform for most Oahu locations.

The nearest long term air pollution monitoring station to Hawaii Kai is located in Waimanalo on the windward side of the Koolau Mountains, and only particulates are measured at that location. For the past 15 years, 24 hour and annual averages of particulate measurements at Waimanalo have been running about half the allowable State of Hawaii AQS and in fact, the station location was specifically chosen to provide an estimate of background particulate levels in the air arriving over Oahu.

G. Ambient Traffic Noise Conditions

The existing traffic noise environment along the Hawaii Kai roadways which would service this project are in the "Moderate Exposure, Acceptable" and "Significant Exposure, Normally Unacceptable" categories. This condition is typical for residential subdivisions on Oahu where the first row of homes fronting a subdivision roadway are setback between 50 to 75 feet from the roadway's centerline. Traffic noise levels along the first row of homes fronting a major roadway generally represent the worst case (or highest) levels for homes of a subdivision. Traffic noise levels at interior lots (second row of homes from the roadway, for example) are generally in the "Minimal to Moderate Exposure, Acceptable" category, with 5 to 10 L_{dn} lower noise levels resulting from shielding and distance effects. An exception occurs for mid- and high-rise structures which are not shielded from the roadway by intervening low-rise units.

Results of calculations of existing traffic noise levels along the six Hawaii Kai roadway sections of interest are shown in Tables 4 and 5. In the tables, Lunalilo Home Road and the Hawaii Kai Drive sections inland (mauka) of Wailua Street are indicated as toward the north. The section of Hawaii Kai Drive between Wailua and Keahole Streets is labeled as the middle section. The traffic volumes used for each roadway section represent averages of the intersection volumes. Average speed, vehicle mix (or classification), and hourly traffic variation data were estimated from the traffic study. The traffic noise levels shown in the tables only apply when unobstructed line-of-sight conditions exist to the roadways. These conditions would generally occur at the first row of homes fronting the roadway, within any open space or parking lot, and at the upper levels of a mid- or high-rise structure. The setbacks of the proposed Marina homes are generally adequate for the existing traffic noise levels, since the majority of the proposed homes are located outside the existing 65 L_{dn} contours.

H. Infrastructure and Utilities

1. Water Supply

Developments in Hawaii Kai are served by three interconnected water systems, depening on their elevations. The low level system has a spillway elevation of 170 and serves those developments that are 100 feet or more below the spillway elevation. All of the units proposed by the marina zoning application would obtain water service from the low level system.

There is adequate existing water storage capacity in the low level system in Hawaii Kai for all existing, ongoing developments, future developments on currently zoned land and the marina zoning parcels. The low level system has four existing reservoirs with a total capacity of 7.0 million gallons. The existing developments

TABLE 4

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS
IN HAWAII KAI

LOCATION	SPEED (MPH)	VPH	**** HOURLY L_{eq} IN dB AT 50 FT **** AUTO	MT	HT	ALL VEH
EXISTING PM PK. HR. TRAFFIC:						
Lunalilo Home Road (North)	30	1880	64.26	56.19	62.65	66.92
Lunalilo Home Road (South)	30	995	61.49	53.43	59.89	64.16
Wailua Street	35	1520	65.21	56.87	62.71	67.5[illegible]
Hawaii Kai Drive (North)	35	390	59.30	50.96	56.80	61.6[illegible]
Hawaii Kai Drive (Middle)	35	1620	65.49	57.15	62.99	67.82
Keahole Street	35	1435	64.96	56.62	62.46	67.2[illegible]
1994 PM PK. HR. TRAFFIC:						
Lunalilo Home Road (North)	30	2570	65.61	57.55	64.01	68.28
Lunalilo Home Road (South)	30	1335	62.77	54.70	61.17	65.4[illegible]
Wailua Street	30	2180	64.90	56.83	63.30	67.[illegible]
Hawaii Kai Drive (North)	30	890	61.01	52.94	59.41	63.68
Hawaii Kai Drive (Middle)	30	2580	65.63	57.57	64.03	68.30
Keahole Street	30	2460	65.42	57.36	63.82	68.[illegible]

Note: Assumed traffic mix of 98% Auto, 1% Medium Trucks, and 1% Heavy Vehicles

TABLE 5

EXISTING AND FUTURE DISTANCES TO 65 AND 60 L_{dn} CONTOURS

STREET SECTION	65 L_{dn} SETBACK (FT)		60 L_{dn} SETBACK (FT)	
	EXISTING	FUTURE	EXISTING	FUTURE
Lunalilo Home Road (North)	67	83	144	179
Lunalilo Home Road (South)	44	53	95	114
Wailua Street	74	74	159	159
Hawaii Kai Drive (North)	30	41	65	88
Hawaii Kai Drive (Middle)	77	83	166	179
Keahole Street	71	80	153	172

NOTES: All setback distances are to the roadway centerlines. See Table 2 for traffic assumptions. L_{dn} assumed to be equal to PM Peak Hour L_{eq}.

connected to this system and unoccupied units in ongoing projects (Marina 10B, Golf Course 4, Kuapa Kai Center, Anchorage, etc.) that will be connected to this reservoir will require a total of 5.265 MGD. The current BWS standards require one gallon of storage for every gallon per day (gpd) of demand. Therefore, there is currently an excess reservoir capacity of 1.735 MG.

The approval of the zoning application would result in approximately 470 low density apartment units and 1930 medium density apartment units. Using the BWS standards of 400 gpd/unit for low density and 300 gpd/unit for medium density results in a total additional demand of .767 MGD. Even considering future projects on lands that are already zoned (Golf Course 5 and 6, the future regional shopping center), there is adequate existing reservoir capacity.

There are existing waterlines adjacent to each of the marina zoning parcels. The existing waterlines were sized to accommodate a much larger number of residential units (as per the 1966 DLUM) and are, therefore, believed to have adequate capacity. All new waterlines to extend service within the parcels and any existing waterlines that need to be replaced due to inadequate design capacity, if any, will be at the developer's cost.

Since there are no sources for water within Hawaii Kai, the developer will work with BWS to provide an adequate source. The availability of water has never been a problem in the development of Hawaii Kai, and we do not anticipate that it will become a problem.

2. Electrical and Telephone Service

Both the Hawaiian Electric Company and Hawaiian Telephone Company are expected to provide services to the project site as the respective areas are developed.

3. Gas

Service for those developments requiring gas will have to be coordinated with HIRI Engineering to insure that proper connections can be made at time of construction.

4. Sewage Requirements

Wastewater from Hawaii Kai, Kuliouou Valley and a portion of Paiko is conveyed via a system of gravity lines, sewage pumping stations and force mains to the East Honolulu Community Services Inc.'s Treatment Plant on the east side of Koko Head. This is a private secondary treatment facility with an existing capacity of 3.9 million gallons per day (mgd). Effluent is discharged through a 36" diameter ocean outfall at a depth of approximately 40 feet.

The total population currently served by the treatment plant is approximately 30,000. The existing average daily flow is 3.0 mgd. This results in a per capita flow of 100 gallons per capita per day (gpcd), including infiltration. approximately 1,050 unoccupied units in ongoing projects will add approximately .41 mgd to the existing average daily flow. This is calculated by multiplying the projected population increase (using the City and County design standards of 4.0 residents/unit for single-family and 2.5 residents/unit for multi-family) by 100 gpcd. The 2,400 units proposed in the marina zoning application would add approximately .6 mgd more. If approximately 400 marina zoning units are occupied each year from 1986, then the capacity of the existing treatment plan may be reached by the early 1990s. Planning is underway to expand the capacity of the treatment plant by .7 mgd to a total of 4.6 mgd. Construction of the expansion would take approxiamtely one and one-half years and it would be initiated so that it could be completed at least six months before required to allow adequate start-up time. At this time, construction is not expected to start prior to mid-1988. All costs for this expansion shall be paid for by the East Honolulu Community Services, Inc.

All other facilities (gravity sewer lines, force mains, sewage pumping stations and the ocean outfall) have sufficient capacity for the projected wastewater flows.

5. Solid Waste

The project area will be regularly serviced by City and County refuse collection or private refuse collection companies. Collected wastes will be transported to public landfills.

I. Public Facilities and Services

1. Police and Fire Protection

An estimated population increase of approximately 5,270 new residents is projected for the fully developed project. Based on the current Oahu police force staff to population ratio of 2.5 to 1,000 and an estimated total addition of 13 officers and support staff would be required to service the area.

The Hawaii Kai Fire Station, which consists of an engine company and a hook-and-ladder unit, is located in the immediate vicinity, across Lunalilo Home Road. The Wailupe Fire Station is also located in the general vicinity. It is anticipated that the proposed project will be accomodated by existing facilities.

2. Health Services

Three health care facilities are located within the immediate project areas with the Kaiser Clinic located in the Hawaii Kai Towne Center and Straub Clinic located at the Koko Marina shopping center, and the Hawaii Kai Emergency and Family Medicine.

Emergency services are offered by the Hawaii Kai Fire Station and an ambulance is stationed at the Wailupe Fire Station. The nearest hospitals are the Kaiser Hospital in Waikiki and Queens Medical Center in Honolulu.

3. Educational Facilities

The project area is located within a triangle of three public elementary schools; Hahaione, Kamiloiki and Koko Head. The closest intermediate school is Niu Valley and the nearest high school is Kaiser High on Lunalilo Home Road.

4. Recreational Facilities

Hawaii Kai has an abundance of public and private recreational facilities either in or abutting the community. The following Table 6 lists facilities, public and private, has been provided to DLU as part of the Zoning Application.

J. Land Use and Regulatory Characteristics

The proposed project is consistent with and will implement the land use policy of the City and County of Honolulu for East Honolulu as established in the Revised General Plan for Oahu and the East Honolulu Development Plan ("EHDP"). All of the tracts to be rezoned are designated for medium and low density apartment use on the EHDP Land Use Map. The State land classification is Urban and the affected parcels lie outside the special management area.

In addition, the recommended transportation program supports and implements the following Honolulu General Plan Transportation policies:

TABLE 6

PUBLIC PARKS AND RECREATION IN HAWAII KAI

A. EXISTING PUBLIC PARKS AND RECREATIONAL FACILITIES

	Park/Recreation Area	Area	Existing Facilities
1.	Hahaione Community Park	± 4 acres	Tot playground, softball field, basketball courts, comfort station, pavilion, parking lot, walkway lights and flood lights for basketball courts.
2.	Hahaione Neighborhood Park	± 6 acres	Comfort station, paved courts, play equipment, sprinkler system and landscaping.
3.	Kamiloiki Community Park	± 10 acres	Community recreation center, one baseball field, one softball field and sprinkler system. Paved courts and play apparatus.
4.	Kamiloiki Neighborhood Park	± 7 acres	Ballfields, comfort station, sprinkler system and landscaping.
5.	Koko Head District Park	± 50 acres	Recreation center building with gymnasium, six tennis courts, three softball fields, one baseball field, one volleyball court, two basketball courts, one comfort station, access road, parking, landscaping and sprinkler system.
6.	Koko Head Sandy Beach Park	± 29 acres	Comfort station, outdoor showers, access road, parking, landscaping and sprinkler system.
7.	Maunalua Bay Beach Park	± 4 acres	Comfort station, picnic benches and tables, landscaping and sprinkler system.
8.	Hanauma Bay Beach Park	± 9 acres	Comfort station, food concession, picnic benches and tables and landscaping.
9.	Koko Head Elementary School Park	± 7 acres	Two baseball fields, three volleyball courts and two basketball courts.
10.	Koko Crater Botanical Garden	±200 acres	Dry land plants.

Table 6 (continued)

Park/Recreation Area	Area	Existing Facilities
11. Koko Head Stables	± 10 acres	Horse riding, stables for rent, horse shows and lessons on horse riding.
12. Koko Head Firing Range	± 25 acres	Rifle and pistol range.
13. Kalama Valley Community Park	± 6 acres	Two softball fields, two volleyball courts, two basketball courts, landscaping and sprinkler system.
B. UNDEVELOPED PARKS		
1. Koko Kai Beach Parks and Access		
a. Lot 4, Koko Kai 1 File Plan 750	23,946 s.f.	
b. Lot 23, Koko Kai 1 File Plan 750	25,986 s.f.	
2. Koko Head Park	±1050 acres	No proposed improvements yet.

Table 6 (continued)

PUBLIC PARKS AND FACILITIES
HAWAII KAI AREA

EXISTING PARKS		Acreage
Hahaione Community Park		4.09
Hahaione Neighborhood Park		6.20
Kamiloiki Community Park		9.98
Kamiloiki Neighborhood Park		7.00
Koko Head District Park		50.00
Koko Head Sandy Beach Park		28.85
Maunalua Bay Beach Park		4.00
Hanauma Bay Beach Park		8.70
Koko Head Elementary School park		6.74
Kalama Valley Community Park		6.00
	Total	131.56

UNDEVELOPED PARKS		
Koko Kai Beach Parks		1.15
Koko Head Park		1,057.15
	Total	1,058.30

OTHER RECREATIONAL AREAS		
Koko Head Botanical Gardens		200.00
Koko Head Stables		10.00
Koko Head Firing Range		25.00
	Total	235.00

SCHOOL PLAYGROUNDS		
Existing:		
Kaiser High School		6.46
Kamiloiki Elementary School		0.75
Hahaione Elementary School		0.50
Koko Head Elementary School		1.60
	Total	9.31

Table 6 (continued)

PRIVATE RECREATIONAL FACILITIES IN HAWAII KAI

A.	GOLF COURSES		
	1. Hawaii Kai Championship (18 holes - regular)	130 acres	
	2. Hawaii Kai Executive (18 holes - par 3)	47 acres	
B.	HAWAII KAI MARINA	260 acres	
C.	PACIFIC ISLANDS CLUB	6.2 acres	Pavilion, 50-meter swimming pool, wading pool, tot lot, six tennis courts, suna baths and meeting rooms.
D.	MARINA PARK 2 (Hancock's Landing)		Boat ramp, parking, landscaping.
E.	PRIVATE RESIDENTIAL FACILITIES		
	1. Golf Course 1 (Queen's Gate and Queen's Point	122 units	Handball court.
	2. Hahaione 1-B (Village Green)	56 units	Swimming pool and patio w/ kitchenette.
	3. Hahaione 1-D (Heritage House)	135 units	Swimming pool.
	4. Hahaione 1-D (Mauna Luan)	433 units	Two large swimming pools, wading pool, putting greens, large pavilion, barbeque pits, tot lot, handball and volleyball courts and clubhouse w/ exercise rooms, showers, saunas and locker rooms.
	5. Hahaione 1-D (Naniwa Gardens)	111 units	Swimming pool, recreation room, weight lifting room, ping pong room, social rooms.
	6. Hahaione 1-D (Hawaii Kai Plaza)	146 units	Swimming pool, community room for meetings and socials.
	7. Kamiloiki 3B-4 (Mariner's Village Three)	291 units	Clubhouse with kitchen facilities and swimming pool.

Table 6 (continued)

8.	Luna-Kai Marina Park	1 acre	Presently landscaped garden and walkway (ultimately to be developed into a 2.4-acre park).
9.	Marina 1-E (Marina Palms)		(Swimming pool and patio.
10.	Marina 1-E (Colony Marina)	189 units	(Swimming pool, boat ramp and patio.
11.	Marina 1-E (Villa Marina)		(Swimming pool.
12.	Marina 1-E (Koko Head Villa)		(Swimming pool.
13.	Marina 1-F-1 (The Moorings)	64 units	Swimming pool and pavilion.
14.	Marina 1-H (Gateway Peninsula)	39 units	Swimming pool, meeting room and kitchenette.
15.	Marina 2-B (Kuapa Isle)	134 units	Clubhouse (meeting rooms, party hall and children's playroom), swimming pool and boat ramp.
16.	Marina Park 1		Boat ramp near Hawaii Kai Drive, southwest of Kuapa Isle.
17.	Marina 4 (Marina West)	60 units	Handball court, picnic area.
18.	Marina 5 (Marina Hale)	51 units	Boat ramp.
19.	Marina 7C (Koko Isle)	124 units	Clubhouse (sauna bath, shower and kitchenette), swimming pool and two open play areas.
20.	Marina 7D (Kaimala Marina)	91 units	Swimming and Jacuzzi (whirlpool) pool.
21.	Marina 7D (Esplanade)	209 units	Sauna bath, putting green, shuffle board, swimming pool, wading pool, tennis courts and pavilion.

Table 6 (continued)

22.	Marina 8 & 9 (Mariner's Cove)	410 units	Clubhouse (kitchenette), boat ramp and dock and swimming pool.
23.	Mt. Terrace	126 units	Swimming and Jacuzzi pool, handball court, exercise room, two sauna baths, kitchenette with activity room, putting green, garden area and jogging track.

TOTAL UNITS SERVED BY PRIVATE RESIDENTIAL FACILTIIES = 2,891

Objective A.

Policy 5

Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.

Policy 7

Promote the use of public transportation as a means of moving people quickly and efficiently, of conserving energy, and of guiding urban development.

Policy 9

Promote programs to reduce dependence on the use of automobiles.

Policy 10

Discourage the inefficient use of the automobile, especially in congested areas during peak hours.

IV

ANTICIPATED IMPACTS AND MITIGATIVE MEASURES

IV. ANTICIPATED IMPACTS AND MITIGATIVE MEASURES

Impacts of the proposed project can be viewed in the short-and long-term. Short-term impacts, beneficial and adverse, generally result from construction-related activities. Consequently, these impacts should last no longer than the duration of the construction. Long-term impacts, beneficial and adverse result from the implementation and operation of the proposed project.

A. Impacts on Geographical Characteristics

Impact on the physical terrain of the proposed parcels of land should be minimal since the proposed parcels consist of either hard ground or fill lands. Also, they are generally level and will require only typical site preparation. Cutting and filling will be kept to a minimum.

B. Impact on Hydrological Characteristics

Associated with urban development projects such as the proposed are alterations in surface water runoff resulting from increasing the area of impervious surfaces, through development of roof tops, roadways, parking lots, and the like. Interest in these runoff changes is generally a result of concern over two factors -- one, public safety, and two, environmental impact. The first factor requires the identification of changes in peak discharge rates. It is the second concern, environmental impact resulting from increased runoff volume and sediment and nutrient loads, and its probable effect on subsequent receiving waters (Kuapa Pond) that is reported.

From an assemblage of baseline hydrologic and water quality data, an estimate of the existing and projected volume and quality characteristics of surface water runoff are made along with projected impacts.

The estimated storm water runoff and constituent changes due to the proposed Hawaii Kai Marina Zoning Project are shown in Table 7. The values presented, it must be emphasized, are for comparative purposes only, and are not intended to be representative of the accuracy implied by the practice of reporting results to one decimal place.

As can be readily observed in Table 7, the storm runoff volume for the 1 yr, 1 hr duration storm for post (full development is 21 times greater than predeveloped 1985) conditions; however, as the storm duration and recurrence interval increases, this difference reduces to less than 1 1/2 to 1. Among other factors causing this difference is that as the intensity and duration of the storm increases, the ability of the soil to accept water decreases which approaches the less permeable conditions that would normally occur under fully developed conditions (from roofs, sidewalks, etc.).

As would be generally expected, the greatest calculated incremental storm runoff volume (34.4 acre-ft/event) resulted from the 100-year storm with a 24-hour duration. These values (acre-ft/event) represent a volume of water and should not be confused with peak discharged per unit of time (e.g., cfs). Peak discharge rates are required for engineering design or proposed drainage facilities and ascertaining the capacity of existing facilities, while total runoff volume provides a more realistic estimate of impact on water quality.

Besides the changes in the volume of storm water runoff, the quality of the various constituents being transported is of equal, if not more importance. However, estimates of water quality constituents resulting from significant storm runoff that occurs at the most only a few times a year is very perplexing, especially since information on this subject essentially only became available at both the local and national level in 1970's.

TABLE 7

Estimated Storm Water Runoff Volume and Constituent Changes due to the Proposed Hawaii Kai Development Marina Zoning Project, Oahu, Hawaii

Storm[a]			Storm Water Runoff											
			Hydraulic			Nitrogen[b]			Phosphorus[c]			Suspended Solids[d]		
			Development			Development			Development			Development		
Duration	Recurrence Interval	Quantity	1980	Full		1980	Full		1980	Full		1980	Full	
hr	yr	in	AF/event	AF/event	AF/event	lb/event	lb/event	lb/event	lb/event	lb/event	lb/event	ton/event	ton/event	ton/event
1	1	1.6	0.4	8.4	+ 8.0	1.1	13.7	+ 12.6	0.1	13.0	+ 12.9	0.77	2.84	+ 2.07
1	5	2.4	2.1	14.5	+12.1	6.4	23.6	+ 17.2	0.6	22.4	+ 21.8	4.34	4.91	+ 0.57
1	10	2.7	3.1	16.8	+13.7	9.2	27.4	+ 18.2	0.9	26.0	+ 25.1	6.26	5.71	- 0.55
1	25	3.2	4.9	20.7	+15.8	14.6	33.8	+ 19.2	1.5	32.1	+ 30.6	9.99	7.04	- 2.95
1	50	3.5	6.1	23.1	+17.0	18.3	37.7	+ 19.4	1.8	35.8	+ 34.0	12.51	7.85	- 4.66
1	100	3.8	7.5	25.5	+18.0	22.3	41.6	+ 19.3	2.2	39.5	+ 37.3	15.22	8.66	- 6.56
24	1	3.9	7.9	26.3	+18.4	23.7	42.9	+ 19.2	2.4	40.7	+ 38.3	16.15	8.93	- 7.22
24	5	7.3	27.2	53.7	+26.5	81.3	87.5	+ 6.2	8.1	83.2	+ 75.1	55.46	18.24	- 37.22
24	10	9.0	38.5	67.5	+29.0	115.0	110.0	- 5.0	11.5	104.5	+ 93.0	78.42	22.92	- 55.50
24	25	11.0	52.4	83.7	+31.3	156.8	136.5	- 20.3	15.7	129.7	+114.0	106.91	28.44	- 78.47
24	50	13.0	67.0	100.0	+33.0	200.2	163.0	- 37.2	20.0	154.9	+134.9	136.52	33.96	-102.56
24	100	15.0	81.8	116.2	+34.4	244.7	189.5	- 55.2	24.5	180.1	+155.6	166.82	39.49	-127.33

a) From U.S. Weather Bureau "Rainfall Frequency Atlas of the Hawaiian Islands" (1962).

b) Based on a nitrogen value of 1.10 mg/L for 1985 conditions and 0.60 mg/L for "Full" development.

c) Based on a phosphorus value of 0.11 mg/L for 1985 conditions and 0.57 mg/L for "Full" development.

d) Based on a suspended solids value of 1500 mg/L for 1985 conditions and 250 mg/L for "Full" development.

The summation of nitrogen, phosphorus, and suspended solids loads from both present (1985) and projected (full) residential development for storms of 1- and 24-hour duration at recurrence intervals of 1-, 5-, 25-, 50-, and 100-years are shown in Table 7. The incremental changes per storm event for the present and projected development conditions for the various duration and recurrence interval storms indicate that from the least to the greatest amount of rainfall: nitrogen increases for the 1-hr duration storms and then decreases when the intensity (>10 yr recurrence interval) of the storms increase; phosphorus increases from 12.9 lb/event to nearly 156 lb/event; and suspended solids shows increases of 2.07 and 0.57 tons/event, respectively, for the 1-yr and 5-yr recurrence interval storms (1-hr duration) and then decreases thereafter to about 127 tons/event for the 100 yr, 24 hr duration storm. The effect of the incremental hydraulic difference between the pre-and-post development conditions is also directly correlated with the water quality constituents.

It must be emphasized that the constituent values are only for comparative purposes, and should not be taken as absolute values. Overall then, the output of nitrogen is about the same and phosphorus is expected to increase in the runoff, while suspended solids, except for the lower intensity/duration storms, should tend to decrease between pre-and-post developed conditions. The decreased amount of exposed soil in residential areas tend to decrease the quantity of the suspended solids loads at the higher intensity/duration storm events even though the total quantity of storm water increases.

The hydrologic and water quality aspects of the surface water runoff were only considered for the present and projected conditions. However, increases in constituents loads will undoubtedly result from construction activities, especially if a significant storm occurs during the interim period between earth moving operations and soil stabilization completion. The impact of construction activities can be minimized by adhering to strict erosion control measures.

C. Impact on Biological Characteristics

All proposed parcels are presently vacant and as such, they provide habitat for exotic species of mammal and avifauna. During the clearing of these parcels, the wildlife will be disturbed and seek refuge elsewhere until construction has been completed. Also, existing vegetation will be cleared and replaced by landscaping. There are no known endangered plants or rare species located on the parcels.

D. Impact on Archaeological Sites

A total of nine archaeological sites and six natural stone cavities possibly containing cultural material were recorded within Kaluanui 1, 2, and 3. The sites and the natural features include: three caves, one free standing wall with associated platform, one platform, one terrace platform complex, one terrace complex, one modern historic habitation area, one modified natural stone cavity complex and six possible burial areas within natural stone cavities.

Document review, field inspection, and analysis indicate that while all the sites and natural cavities will be directly or indirectly impacted to some degree by the proposed development. Most of the impacts are indirect because all but one or two of the sites are in steep, non-buildable areas. The developer will conduct appropriate salvage excavation prior to any construction activities. Recommendations include preservation and testing of the major site, a large terraced platform with associated petroglyphs indicating a prehistoric high status habitation area. Other recommendations are testing and reevaluation on one site, salvage excavation on seven sites, and monitoring of selected areas during subsurface construction. It is also recommended that intensive survey be conducted on the slope of Kaluanui Ridge to locate additional natural cavities which may contain cultural materials. These should be sampled and reevaluated regarding the need for further research. No further work is recommended for the modern habitation site.

The developer has concurred with recommendations for recovery and preservation of the terraced platform and has initiated restoration and preservation of the site.

E. Impact on Traffic Conditions

Study Assumptions and Analysis Framework

The analysis of future travel needs and development of recommended rideshare and roadway programs reflect the following assumptions and guidelines:

- The travel forecasts assume incremental development and completion of the additional Hawaii Kai developments in 1994 and use this as the analysis year. Actual economic and real estate market conditions may shorten or lengthen this development period.

- The travel analysis assumes that TheBus public transit service to Hawaii Kai will increase proportionate to the future population increases and demands.

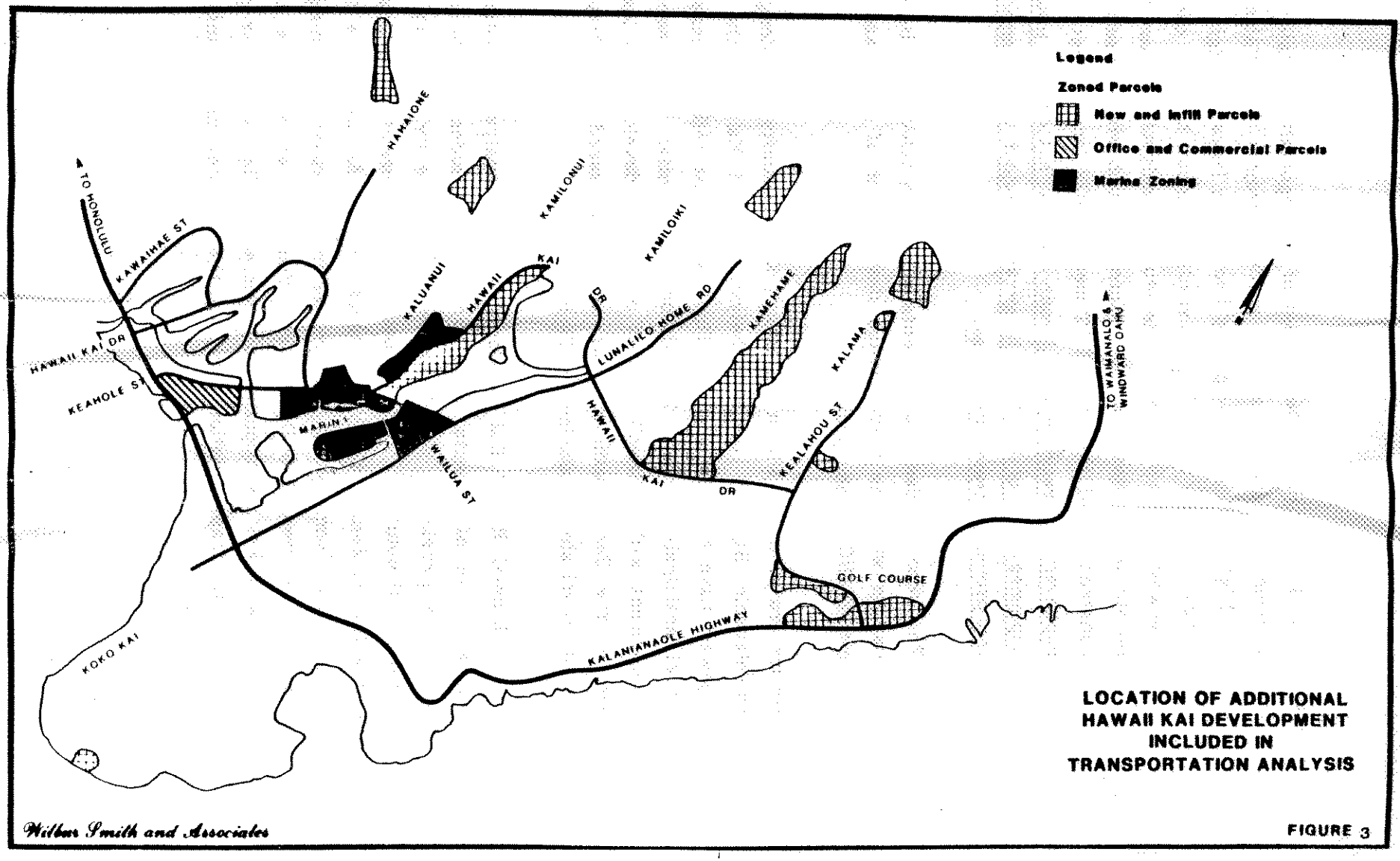
- Current and 1994 highway conditions were assessed through a volume capacity analysis of the key intersections along Kalanianaole Highway and within Hawaii Kai for both the morning and evening peak traffic hours. These peak traffic hours are the one-hour morning and evening periods which experience the largest volume of traffic at each intersection, and which thus should represent the most severe congestion and delays at that location.

- The State of Hawaii Department of Transportation (State DOT) is presently planning a major roadway project along Kalanianaole Highway which would add two traffic lanes for high occupancy vehicles (HOV) in the roadway median between the H-1 Freeway and Hawaii Kai. This study's analysis does not incorporate the highway capacity increase which would result from construction of the State DOT median HOV lane project. The improvements recommended herein thus do not depend upon implementation of the State long-range project to accommodate the projected travel increases.

- The recommended improvements have been selected to be compatible with the longer-range development of the State DOT median HOV lanes project.

Future travel needs within the Hawaii Kai community and along the Kalanianaole Highway corridor between Hawaii Kai and the H-1 Freeway have been identified. This assessment reflects increased travel anticipated from: 1) additional residential and commercial development within Hawaii Kai; 2) other new developments identified in the East Honolulu area; and 3) increased tourist/recreational travel along Kalanianaole Highway.

The additional Hawaii Kai development being analyzed consists of two categories of projects. The first group includes parcels which have been previously zoned for residential use by the City and County of Honolulu[1]. The second group, referred to hereinafter as the Marina Zoning parcels, includes projects for which the Kaiser Development Company is now requesting approval of zoning in order to implement the Development Plan. Location of the additional Hawaii Kai development is depicted in Figure 3. For purposes of this transportation analysis, the following unit counts are being used: [2]



LOCATION OF ADDITIONAL HAWAII KAI DEVELOPMENT INCLUDED IN TRANSPORTATION ANALYSIS

Wilbur Smith and Associates

FIGURE 3

Additional Development	Previously Zoned Projects	Marina Zoning Projects
Single-family Residences Under Construction	373	0
Vacant Zoned Lands	611	0
Multi-family Units	66	2,400
Offices (sq. ft.)	100,000	0
Commercial Space (sq. ft.)	233,000	0

This study recommends implementation of a transportation program which would accommodate the increased travel needs identified for the Kalanianaole Highway corridor. The proposals include both a program of ridesharing measures to encourage increased use of buses, vanpools and carpools, and roadway modifications to provide sufficient capacity at traffic bottlenecks.

(1) Vacant residentially zoned lands, tracts under construction and constructed but unsold units, e.g. Commodore condominium, are within this group.

(2) Actual development may differ. The number of units represents a realistic development program, and thus, a realistic transportation analyses.

1. The increases in Hawaii Kai traffic on Kalanianaole Highway, based on current travel mode useage, is estimated as follows:

Land Use	Morning Peak Hour Towards Honolulu	Morning Peak Hour Towards Hawai Kai	Evening Peak Hour Towards Honolulu	Evening Peak Hour Towards Hawaii Kai
Residential:				
Zoned Tracts	+430	+ 90	+150	+370
Marina Zoning	+460	+ 90	+190	+340
Zoned Commercial(3)	-100	+100	-180	-330
Net Increase	+790 (1)	+280	+160	+380 (1)
Current Trips	2,800	800	1,050	2,200

The expanded commercial development would attract many of the Hawaii Kai resident work and shopping trips which are currently made to the central Honolulu area, thus limiting the traffic increase on Kalanianaole Highway.

2. Without the recommended improvements, the Kalaniiki Street intersection would continue to constrain traffic movement on Kalanianaole Highway during the morning peak hour, with the additional traffic exceeding the intersection capacity by approximately 8 percent.

3. Without the recommended program, the increased traffic volumes on Kalanianaole Highway during the evening peak hour would exceed the intersection capacity at East Halemaumau, Kuliouou/Elelupe and Keahole Streets.

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(1) Additional employment centers such as retirement community, commercial, high tech or other job creating uses that are presently being considered for other Hawaii Kai areas could further reduce the peak hour traffic shown above.

Within Hawaii Kai, the present major roadways would be sufficient to accommodate the increased traffic, with the exceptions of the Hawaii Kai Drive intersections with Keahole and Wailua Streets. During the morning peak hour, the heavy makai direction left-turns at these intersections would exceed the capacity of the present single left-turn lane.

Recommended Transportation Program

The forecasts and findings were used to identify a transportation program to serve the increased travel needs for the proposed developments in Hawaii Kai as well as other identified East Honolulu developments and increased tourist/recreational traffic along Kalanianaole Highway. The proposed measures include implementation of an aggressive ridesharing program to promote higher vehicle occupancies, and therefore, more efficient use of the present roadway. A series of roadway modifications have also been identified to improve traffic conditions at those identified "bottleneck" and problem locations.

1. Ridesharing Program

   The proposed ridesharing program, as outlined in Table 8, is intended to supplement TheBus services by providing new types of service, or direct service to new destinations not presently available. The broad range of recommended measures would expand rideshare accessibility to both present and new residents of Hawaii Kai.

2. Proposed Roadway Modifications

   These projects are directed towards locations which would constrain future traffic flow. The proposed program emphasizes use of roadway projects which require minimum taking of right-of-way and use of government eminent domain powers, and which could be implemented within a two to three year period. These projects are identified in Table 9.

Table 8

RECOMMENDED RIDESHARING PROGRAM

MEASURE	DESCRIPTION	RESULTS	IMPLEMENTATION COSTS[a]	ANNUAL OPERATING COSTS[a]
Transportation Manager for Hawaii Kai	Person to initiate, administer and promote rideshare measures and services.	Increases usage of services by 5%	$10,000	$40,000
Free Bus Passes to New Residents	Distributed to new Hawaii Kai residents for one year following move in for use on express buses.	Encourages 40% increase in express bus use.	---	Varies $7,000 to $17,000
Vanpools	Purchase of vans for vanpools in Hawaii Kai.	Estimated potential for 11 vanpools.	$17,000 per vanpool	0
Provide Park-and-Ride Facility	Provide parking and shelter for bus rides, vanpoolers, and carpoolers. Phase 1 - 140 spaces Phase 2 - 210 spaces (total)	Permit increased resident access to bus services.	$570,000[b] $180,000[b]	$25,000 to $30,000
Bicycle Lockers	Install at major bus stops.	Encourage use of bicycles to access bus services.	$20,000	---
Hawaii Kai Express Bus Club	Buspools from neighborhood to work location on monthly subscription basis.	Estimated potential for 5 buspools.	0	$25,000 subsidy per bus
Aina Haina - Niu Valley - Kuliouou Express Buses	Provide 3 express buses to Downtown Honolulu and and Waikiki/Ala Moana.	Would greatly reduce bus travel times over present service and attract increased patronage.	0	$35,000 subsidy per bus

(a) Preliminary cost estimates reflect 1984 unit cost factors.
(b) Land costs not included in estimate.

Table 9

RECOMMENDED ROADWAY MODIFICATIONS

LOCATION	DESCRIPTION	RESULTS	COSTS[a]
Pedestrian Overpass at Kalani High School	Construct over Kalanianaole Hwy. near Iki Place. Relocate makai bus stop to Iki Place and prohibit crossings at Kalaniiki and Laukahi Streets.	Increases signal green time available to Kalanianaole Highway traffic at Kalaniiki and Laukahi Streets.	$1,000,000[b]
Waikui Street & Kalanianaole Hwy.	Allow left-turn from Waikui St. in morning peak period.	Reduces left-turns and traffic queue lengths on Waieli St.	10,000
Kalanianaole Hwy. at Keahole St.	Widen the Koko Head direction to provide a second left turn lane to Keahole Street.	Reduces left-turn blockage of lanes and reduces delays to left-turn and through traffic in afternoon.	140,000
Hawaii Kai Drive at Keahole St.	Realign intersection to improve Keahole St./mauka Hawaii Kai Dr. approaches as the "through" street.	Improve traffic flow through intersection for heaviest morning and evening movements.	350,000
Hawaii Kai Drive at Wailua St.	Restripe Wailua St. to provide two Ewa direction lanes.	Provides two left-turn lanes for heaviest morning traffic movement.	20,000
Kalanianaole Hwy. Four-Lane Section	Improve makai-side bus pull-outs at East Halemauamu St. and Kuliouou Rd.	Permits buses to currently stop in through lane in afternoon.	20,000
Keahole Street	Widen to provide left-turn lanes; install and inter-connect traffic signals.	Facilitates ingress-egress for park-and-ride facilities and Towne Center development. Interconnection reduces vehicle stops at signals.	485,000

(a) Preliminary cost estimates reflect 1984 unit cost factors.
(b) Includes land costs - $400,000.

The program elements would complement the planned development of the State DOT's long-range corridor improvement project. Conversely, the transportation program can be implemented and would be sufficient to accommodate the increased development independent of the State DOT's Kalanianaole Highway project.

Effectiveness of Measures

The recommended transportation measures would accommodate the travel growth on Kalanianaole Highway that would result from the zoned and requested Hawaii Kai development, as well as the growth from other increases in corridor activities. This would be accomplished through a combination of fewer vehicle trips as a result of the ridesharing measures, and increases in corridor traffic capacity as a result of the roadway modifications at the "bottleneck" locations.

Implementation of the rideshare program is estimated to encourage a 20 percent increase in Hawaii Kai resident use of buses, vanpools, and carpools as compared to a continuation of current travel mode use. The estimated number of rideshare program participants and the reduction in vehicle trips on Kalanianaole Highway is summarized in the following table. The estimates are for peak hour, peak direction travel at full implementation of the program.

Measures	Additional Riders		Reduction In Auto Trips	
	Morning	Evening	Morning	Evening
Free Bus Passes	60	40	30	30
Park-and-Ride Parking Spaces	70	55	55	45
Vanpools	110	85	65	50
Express Club Bus	200	160	110	85
Aina Haina/Niu Kuliouou Express	120	80	60	40
Bicycle Facilities	10	10	5	5
Transportation Manager	50	40	35	25
Total	620	470	360	280

During the morning peak hour, the "bottleneck" location would be the Kalanianaole Highway intersection with Kalaniiki Street. As indicated in the following table, the rideshare measures, increased HOV lane use, pedestrian overpass, and traffic operation modifications would provide an equivalent increase in vehicle capacity to more than offset the estimated travel increase. These measures would permit movement of the additional trips through the bottleneck section while maintaining traffic flow similar to today's conditions.

The critical location during the evening peak hour would be the East Halemaumau Street intersection on the four-lane section of Kalanianaole Highway. The increase in the peak direction traffic (towards Hawaii Kai) is estimated at 140 vehicles, with implementation of the ridesharing measures. This increase can be accommodated within the capacity of the present facility.

	Morning Peak Hour Peak Direction At Kalaniiki (Vehicle Equivalents)	Evening Peak Hour Peak Direction At East Halemaumau (Vehicle Equivalents)
Traffic Increase without Measures:		
Hawaii Kai	690	360
Other Developments	80	10
Recreation Trips	0	30
Total	770	400
Compared to Capacity Increase:		
Rideshare Measures	360	260
Increase HOV Lane Use	120	0
Roadway Modification	375	0
Total	855	260
Net Change	-85	+140 (4)

Other Kalanianaole Highway intersections have sufficient capacity to accommodate both the morning and evening increases in peak hour traffic.

(4) Still can be accommodated within the capacity of the intersection.

This analysis does not include the additional lanes proposed in the State DOT's median HOV lane project. The two additional lanes would increase the peak direction traffic capacity at Kalaniiki Street during the morning peak hour and at East Halemaumau Street during the evening peak hour.

Implementation Schedule and Costs

A tentative implementation schedule has been developed for the ride-sharing and roadway measures which would generally provide additional capacity or increased ridesharing to offset the travel increases from the anticipated phasing of the new Hawaii Kai projects. The implementation schedule is based upon granting of final approval of the zoning request in mid-1986 and is subject to change. Actual implementation will be schedule to parallel the occupancy of the new residential units.

Ridesharing Measures

- The Transportation Manager would initiate rideshare coordination and marketing in mid-1986.

- Free bus passes would be distributed to initial occupants of the new Hawaii Kai residential developments between 1987 and 1994.

- Vanpool program would be initiated in 1987 and expanded as the number of drivers and riders increases.

- An initial 140-space park-and-ride facility would be opened in late 1987. Additional spaces would be added as needed, with 70 more spaces planned for 1990.

- The Hawaii Kai Express Club buses would initiate service in 1988, with service expanded to meet resident needs.

- The Aina Haina-Niu-Kuliouou express bus service would be initiated in 1991.

- Additional HOV lane permits should be issued by State DOT to increase HOV lane use during the morning peak hour by 120 vehicles.

Roadway Modifications

- Complete construction of the Kalani High School pedestrian overpass in 1988. In conjunction with the overpass, reactuate the Ainakoa Avenue/Waikui Street traffic signal during the morning peak period and allow left-turns from Waikui Street onto Kalanianaole Highway.

- On Hawaii Kai Drive, realign the Keahole Street intersection, and restripe the Wailua Street intersection in 1987.

- Provide double left turn lanes from Kalanianaole Highway to Keahole Street in 1990.

F. Impact on Air Quality

Air Quality Impact of Project Construction

During the site preparation and construction phases of this project, it is inevitable that a certain amount of fugitive dust will be generated. Field measurements of such emissions from apartment and shopping center construction projects has yielded an estimated emissions rate of 1.2 tons of dust per acre of construction per month of activity. This figure assumes medium level activity in a semi-arid climate with a moderate soil silt content. Actual emissions of fugitive dust from this project can be expected to vary daily depending upon the amount of activity and the moisture content of exposed soil in work areas.

One major generator of fugitive dust is heavy construction equipment mitigated by completing and paving roadways and parking

areas as early in the development process as possible. Because most construction will be taking place in close proximity to existing residential areas, dust control will have to be an item of special concern throughout the construction phase of the project.

Heavy equipment at construction sites will also emit some air pollutants in the form of engine exhausts. The largest equipment is usually diesel-powered. Carbon monoxide emissions for large diesel engines are generally about equal to those from a single automobile, but nitrogen dioxide emissions from this type of engine can be quite high. Fortunately, nitrogen dioxide emissions from other sources in the area should be relatively low and the overall impact of pollutant emissions from construction equipment should be minor compared to levels generated on major roadways nearby.

Air Quality Impact of Increased Energy Utilization

Estimating about 1,000 square feet average size for the 2,400 multi-family units now planned for the marina zoning project yields a total of 2.4 million square feet of floor space. Energy consumption rates at the power plant for all-electric apartments are about 72,000 BTU per square foot. Thus, this project would require about 30,000 barrels of oil if the demand were to be met totally by burning fuel oil.

The major impact of burning fuel oil to meet this increased energy demand will be increased levels of sulfur dioxide and particulates in the vicinity of existing power plants, primarily the Kahe Power Plant on the Waianae coast.

This energy requirement could be reduced substantially by the installation of solar water heating on all new units. It is also possible that the new demand could be met by means other than burning fuel oil. Generation of electrical energy by wind power and by using ocean thermal energy conversion are two such possibilities.

Indirect Air Quality Impact of Increased Traffic

Once construction is completed the proposed project will not in itself constitute a major source of air pollutants. By serving as an attraction for increased motor vehicle traffic in the area, however, the project must be considered to be a significant indirect air pollution source.

Motor vehicles, especially those with gasoline-powered engines, are prodigious emitters of carbon monoxide. Motor vehicles also emit some nitrogen dioxide and those burning fuel which contains lead as an additive contribute some lead particles to the atmosphere as well. The major control measure designed to limit lead emissions is a Federal law requiring the use of unleaded fuel in most new automobiles. As older cars are removed from the vehicle fleet lead emissions should continue to fall. In fact, the Federal Environmental Protection Agency is currently advocating that lead be removed from all automobile fuel as soon as possible.

Federal control regulations also call for increased efficiency in removing carbon monoxide and nitrogen dioxide from vehicle exhausts. By 1995 carbon monoxide emissions from the vehicle fleet then operating are mandated to be little more than half the amount now emitted.

Short Term Mitigative Measures

As previously indicated the only direct adverse air quality impact that the proposed project is likely to create is the emission of fugitive dust during construction. State of Hawaii regulations stipulate the control measures that are to be employed to reduce this type of emissions. Primary control consists of wetting down loose soil areas. An effective watering program can reduce particulate emission levels from construction sites by as much as 50 percent.

Other control measures include good housekeeping on the jobsite and pavement or landscaping of bare soil areas as quickly as possible.

Long Term Mitigative Measures

Once completed, the proposed Marina Zoning projects are expected to have little direct impact on the air quality of the surrounding region. Indirect long term impacts in the form of increased air pollutant emissions from power plants serving new residences in the project area can be mitigated somewhat by planning and implementing solar energy design features to the maximum extent possible.

Other indirect long term air quality impacts are expected in those areas where traffic congestion can potentially be worsened by the addition of vehicles travelling to and from the proposed project. Project planners can do very little to reduce the emission levels of individual vehicles, but the traffic management study for the project describes in detail a multifaceted ridesharing program that could be implemented to significantly reduce traffic volumes along the main traffic corridor between Hawaii Kai and downtown Honolulu. The traffic management study also provides detailed descriptions of roadway improvements that could significantly alleviate traffic congestion in the vicinity of the major 'bottlenecks' along Kalanianaole Highway.

The State of Hawaii Department of Transportation has proposed additional road-widening measures to decrease traffic congestion along the Kalanianaole Highway corridor. Carbon monoxide modelling conducted as a part of the air quality study indicates that the ridesharing and intersection-specific roadway improvements desbribed in the traffic management study for the project would be adequate to ensure compliance with State and National air quality standards even if the proposed State projects never materialize.

Because the stringent national vehicular emissions reduction program now being pursued is entirely the project of eminently changeable government regulations, it is always possible that economic conditions or other factors could lead to an early abandonment of this program. If that were to occur, then the projected pollutant levels presented in the air study could be too optimistic. On the other hand, this analysis did not consider the possibility that technological innovation may lead to new vehicular power systems that produce few or none of the currently regulated atmospheric pollutants.

In any case, this study indicates that currently proposed mitigative measures for traffic congestion along the Kalanianaole Highway corridor should be sufficient to meet existing air quality requirements as well.

G. Impact on Noise Environment

Predictions of future traffic noise levels were made using the year 1994 traffic volume predictions of the traffic study. It should be noted that the future traffic noise levels represent the combined influence of previously approved projects within Hawaii Kai plus the current Marina zoning project.

Although not examined in detail, future traffic noise level increaases along Kalanianaole Highway attributable to the Marina zoning request were calculated. In respect to traffic noise increases, the Marina Zoning project will not produce measureable changes along the highway. This is due to the relatively low traffic volumes predicted for the project as compared to the current high traffic volumes on the highway. Predicted traffic noise level increases by 1994 were calculated to be less than 1 dB along Kalanianaole Highway.

Traffic noise increases resulting from both the Marina zoning parcels and other approved development projects in Hawaii Kai will range from 0.03 to 2.05 dB within the Hawaii Kai roadways of interest, and will be less than 1 dB along Kalanianaole Highway. In calculating the project-related noise increases, it was assumed that 37 percent of the total increase in traffic volumes was attributable to the Marina zoning parcels. This percentage is midway between the 32 to 42 percent range estimated in the traffic study.

In absolute terms, future traffic noise levels along the low volume north section of Hawaii Kai Drive should not exceed 65 L_{dn} at 50 ft setback distance from the roadway centerline. Therefore, existing and planned residences along this section should remain in the "Moderate Exposure, Acceptable" noise exposure category.

Future traffic noise levels along the high volume roadways will exceed the FHA/HUD standard of 65 L_{dn} at existing and planned residences immediately adjacent to Lunalilo Home Road, Wailua Street, Keahole Street, and the middle section of Hawaii Kai Drive between Wailua and Keahole Streets. These units are predicted to be in the "Significant Exposure, Normally Unacceptable" noise exposure category, and sound attenuation measures will be required in order to comply with FHA/HUD noise standards. Of the 2400 Marina Zoning units, approximately 60 units fall into this category based upon the present conceptual site plans. The remaining 2340 units are in the acceptable categories. Existing residences along Lunalilo Home Road will continue to be in the "Significant Exposure, Normally Unacceptable" noise exposure category, but increases in future traffic noise levels will be difficult to perceive.

Traffic noise impacts resulting from the Marina zoning parcels will be associated more with final siting of the Marina units rather than with the added vehicular traffic generated by the Marina project. The majority of the planned Marina units are within the "Moderate

Exposure, Acceptable" and "Minimal Exposure, Unconditionally Acceptable" noise exposure categories. Therefore, the project should not result in serious adverse noise impacts which are not correctable.

Possible noise mitigation measures which would minimize noise impacts on existing and future Hawaii Kai residences in the proposed Marina project area include measures such as; increasing the setbacks of future homes in the Marina parcels; constructing sound attenuation walls where adequate setbacks cannot be achieved in future or existing homes; reducing posted speed limits below 35 MPH so as to reduce future traffic noise; incorporating special sound attenuating window design features in upper-story homes which cannot be shielded by sound attenuating walls; and air conditioning affected spaces. The applicability of each mitigation measure depends on other considerations besides noise, such as economic cost, aesthetics, and technical feasibility.

H. Impact on Infrastructure and Utilities

Drainage, potable water supply, sewerage, telephone and electrical systems are currently available on adjacent sites. Master planning for a community of a population larger than presently allowed has insured capacity for expansion. Approvals by the appropriate government agencies will be sought during the zoning application review process. Refuse collection will be reviewed by the Department of Public Works and in the event that private collection is required, this service will be arranged.

I. Impact on Public Facilities and Services

There are existing fire and police protection services available to the established Hawaii-Kai community. Review by these agencies on the anticipated demand for expanded services will be coordinated during the review of the zoning application. Since the

project phasing is scheduled for approximately seven years, the timing can be such that increased services can be provided on a timely basis. No significant adverse impacts are anticipated.

J. Impact on Economic and Social Characteristics

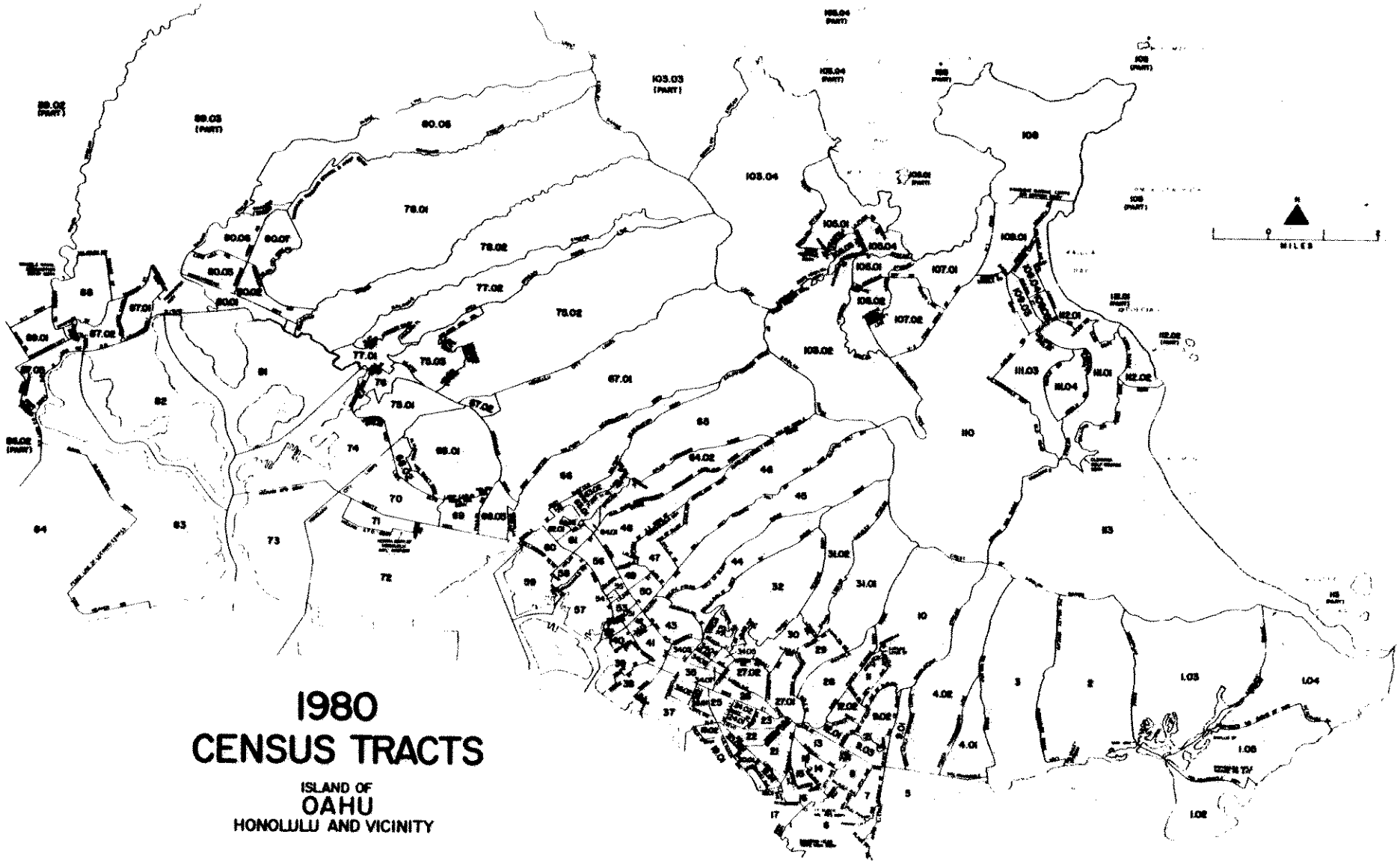
1. Economic Impact

Economic impacts due to the short-term construction activity that will result from the rezoning of the affected parcels will greatly enhance the economy by the millions of dollars spent for labor, materials, and other development oriented expenditures over the course of this project. This activity will create revenue for the State through additional excise taxes. The exact number of jobs to be attributed to the implementation of the project is undetermined at this time. The phasing schedule must remain flexible to meet market conditions and financing costs which can inhibit or increase buyer demand. The completed development will substantially add to City & County real property tax revenues.

2. Social Impacts

For purposes of this report, the Hawaii Kai community is comprised of the four census tracts used by the U.S. Bureau of the Census - CT 1.02, 1.03, 1.04, and 1.05. All but 120 of the proposed 2,400 housing units would be located in census tracts 1.03 and 1.05; the 120 units would be in tract 1.04 (Figure 4).

Hawaii Kai is a unique community in many ways. Its advantages include a well-planned, self-contained community in a desirable natural environment. It is made up of a fairly homogeneous population in terms of socio-eoncomic characteristics and background. Statistics confirm that taken as a whole, it is a more affluent, well-educated population, with an almost equal mix of local-born



Marina Zoning

Census Tracts

FIGURE

people versus those born in other places. Other indicators of the homogeneity and productivity of its residents include the significant findings regarding age, education, occupation, labor force, and income factors.

It is a profile of a community which includes fairly young households (with an average 3.4 people per household), where most adults fall in the 35 to 54 age bracket, and where most children are between 5 to 19 years of age. Hawaii Kai has a large percentage (73%) of employable people and its unemployment rate is the second lowest in this county. The affluence of the residents is reflected in the high median incomes; the large number (82%) who own their homes and drive their own cars to work (88%); and the sizable proportion who send their children to private schools (37% for grades K - 8, and 35% for grades 9 - 12).

The nature and degree of social impact and social change in a community will depend upon the type and size of the development, as well as the community's capacity to adapt and adjust to change.

The proposed development involves only housing, not a mixed development. The additional 5270 people resulting from the 2,400 housing units will mean an eventual 18% increase in population, from approximately 30,000 to 35,000 people. While this is a rather large increase, the mitigating factor is that the increase will be gradual, as the development will be incrementally phased over a seven year period and attuned to the needs and demands of the marketplace. The projected population increase falls within the Oahu General Plan's population guidelines for this area.

Hawaii Kai's greatest growth spurt was in the decade of the 1970s, when its population slightly more than doubled (104%). The greatest social impact and change would have occurred during that period. The population increase has leveled off to about 5% in recent years, and the anticipated gradual growth may well average out to this rate of growth.

The apparent stability of this community, reflected by its "coming of age" maturity, as well as its homogeneous middle and upper-middle class population with similar social values and norms, lend support to the assumption that its residents have good capacity to adapt and to adjust to change.

The most important variables in social impact assessment are the community's lifestyle and the quality of life. Of great concern is what effect a particular development will have upon them.

Most of the people who live in Hawaii Kai made a concious choice to do so because of the advantages that the area offers. These advantages include the stability, amenities, and quality of life that are commensurate to their above average socio-economic status and that the residents have made financial and emotional commitments and are strongly motivated to maintain and enhance the existing lifestyle.

Moving into a well-established and prestigious residential area, it is anticipated that the new population will possess similar socio-economic characteristics. They would have similar social values and goals, and behavior norms that will be consistent with those of the existing population. Therefore, conformity and the desire to continue and maintain the quality of life can be expected. The gradual, rather than rapid, influx of new residents will favorably help in their assimilation into the community.

Some social changes will occur, however, as any development produces change. The one major factor which would impact on the lifestyle and quality of life of residents in Hawaii Kai and adjacent areas is the increased vehicular traffic which additional residents will generate. The existing traffic congestion on Kalanianaole Highway is exacerbated by the residents' basic dependence on private rather than public transportation. Increased traffic would impact

on the lifestyle and the quality of life as people make further adjustments to their daily schedules of living. The major mitigating factor will be the transportation management system that the developer, the City and the State will jointly implement to accomodate the increased traffic. The transportation program has been discussed earlier in this report. A second mitigating factor will be the ability of Hawaii Kai residents to adapt and adjust to more ridesharing alternatives.

On the issue of benefits for the community and its residents, the "economic costs versus benefits" ledger tilts in favor of the development although the exact numbers of jobs it will create is undetermined due to its planned phasing and flexible construction schedule, the project will contribute to the economy through the millions of dollars that will be spent on labor, materials, and other development-oriented expenditures. Beyond that, tax revenues would be generated through the potential new jobs that an increased population will require, as well as increased sales taxes and property taxes.

As Hawaii Kai is a residential community, the development would not directly impact the visitor industry or the visitor population.

Another economic benefit is that 2,400 units will be added to the island's housing inventory. Locations, Inc.'s Oahu Residential Market Study confirmed that there is a current shortfall in housing units on Oahu, particularly affordable housing. The study also identified Hawaii Kai, Makakilo, and Mililani to be the most feasible areas for future housing development.

Flexibly geared to meet market demands, the proposed 2,400 units would provide quality housing in a quality environment, and would be aimed at attracting a wide variety of buyers. As low to medium density units are cheaper to build than detached single dwelling houses, the intent is to make more affordable housing available, particularly to first-time buyers.

Depending on a person's or a community's social and economic values, there are plausible arguments for both preservation of the status quo and growth. Both have advantages and disadvantages, with clearly identifiable socio-economic benefits and costs.

One resolution is to have selective, high quality developments which will preserve those values considered to be the most valuable to the people affected, while providing social and economic benefits. These would include well-planned and implemented projects, architecturally and tastefully appropriate to the environment, which would have minimal social impact on the community.

Evaluated in the context described above, the proposed Marina Zoning project appears to be such a development. The integrity and commitment of Kaiser Development Company is evidenced by the quality development of the Hawaii Kai planned community over twenty four years - a long period of time. This is a significant factor as it provides greater assurance that the proposed development will protect environmental concerns for continued aesthethic quality and adequate open space. Also, that the developer will be sensitive to the concerns and needs of the residents, will work with government to find appropriate solutions to problems such as traffic congestion, and provide appropriate amenities which will not only maintain, but enhance the existing lifestyle and quality of life of its residents.

K. Impact on State Plan and Functional Plans

The Hawaii State Plan has been prepared for use as the primary planning tool in directing the planning process for Hawaii's long and short-term goals. By setting the overall theme and directive, twelve functional plans were created as extentions of the State General Plan. These functional plans specify objectives, policies, and implementing actions to address these concerns. These plans were reviewed to determine their relationship to the Marina Zoning project. Each plan is reviewed and evaluated below.

STATE EDUCATION PLAN & STATE HIGHER EDUCATION PLAN

This plan relates to educational functions, respective school systems, growth and goals. Office procedure (records in a computer system), target groups, personnal developments, and school sites are discussed. As related to the proposed project, demand for educational facilities will be increased, however, existing facilities will accomodate this increase.

STATE HOUSING PLAN

Relating to the East Honolulu District, the Plan states:

"The county intends that East Honolulu continue as a suburban, low density residential area with development confined to the low ridges and inner valley floors. Some medium density residential will be permitted. Aina Haina to Kuliouou is considered a stable community area and its present character should be enhanced.

There are no obvious siting problems between the proposed developments and the development plan. Most of the proposals for this area are in Hawaii Kai. One possible conflict is that of the 6,370 units proposed for the area, 23% are multi-family units. This may be somewhat more than anticipated by the development plans. A conflict of greater consequence given the present traffic problems for the area is that the full build-up of units proposed would result in a 51% increase over the 1978 population by 1985."

The Marina Zoning will result in a population increase of 5,270. Almost 30,000 people reside in Hawaii Kai today. The zoning implements the East Honolulu Development Plan.

STATE HEALTH PLAN

The primary purpose of the State Health Plan is to serve as a guide for State and County agencies and the private sector in outlining environment related and health care objectives for Hawaii.

"More specifically, the plan's objectives, policies and implementing actions are intended to 1) prevent disease and promote healthful lifestyles and environmental conditions; 2) ensure and promote appropriate provision and access to health care for the total community; 3) protect society from potential dangers (e.g., epidemics, hazardous environmental conditions or violent persons); and finally, 4) prevent environmental degradation and enhance the quality of the air, land and water."

"The State Health Plan focuses primarily on public health programs under the jurisdiction of the State Health Department."

As the State Health Plan relates to the proposed project, health and medical care facilities (emergency and routine) are located within the immediate area and are expected to accomodate the additional population of the project.

Environmental concerns covered in the State Health Plan have been addressed in the air and noise quality studies and utilities sections of this document. Utility impacts such as sewerage and drainage, as it affects water quality, are expected to create only minor impacts that are normal for projects of this nature. Mitigation of these impacts are the responsibility of the developer and will be addressed as necessary. Air and noise quality impacts, as reported in their respective studies, are also minor in nature.

STATE CONSERVATION LANDS PLAN

This relates to conservation lands and does not address this project site.

STATE AGRICULTURE PLAN

The Hawaii State Plan states its two primary objectives as 1) increased viability in the sugar and pineapple industries, and 2) continued growth and development of diversified agriculture throughout the State. More specifically, the State Agriculture Plan identifies the major issues and problem areas affecting agriculture, which are the underlying needs and requirements of the commodity industries for resources such as land, water, capital, labor, and transportation; and for government support to agriculture in the areas of farm management, cultural practices, pest control, handling and processing, livestock production, marketing, waste management, and government regulation.

As the Marina Zoning project relates to the State Agriculture Plan, a portion of the project area will be taken out of agricultural use, however, the area is not well suited for agriculture and is not expected to have any impact on State agriculture. Furthermore, no agricultural activity has taken place for over the last 20 years. As stated earlier, the agriculture zoned areas of the project site are vacant and essentially surrounded by urban uses.

STATE HISTORIC PRESERVATION PLAN

The Historic Preservation Plan, reviews the procedures and identifies areas where archaeological salvaging or preservation are desireable. Procedures for developments include preparing an archaeological survey, preserving sites considered of value, and coordination of salvaging and preservation with the State Historic Sites Office. In this regard, the Marina Zoning project has complied with these procedures.

STATE TRANSPORTATION PLAN

The general objectives of this plan are outlined in these two statements:

> An integrated multi-modal transportation system which services statewide needs relating to the efficient, safe, and convenient movement of people and goods.
>
> A statewide transportation system supportive of planned growth objectives throughout the state.

Although the State Transportation Plan does not single out the Hawaii Kai/Marina Zoning area for any specific highway development or improvement policies and actions, the development will increase vehicular traffic in the general area. For this reason, an extensive traffic study has been conducted and mitigative measures recommended. These measures, which include roadway modifications and rideshare methods, are presented in an effort to meet the general objectives of the Plan.

STATE RECREATION PLAN

The State Recreation Plan reviews the demands and actions that need to be taken to fulfill existing and future recreational demands. Specifically , in the East Honolulu District, the Plan acknowledges the demand for recreational activity and the varing availability for community-oriented park acreage. In this respect, although available parks within Hawaii Kai are adequate, additional park space is planned for a portion of the development.

STATE ENERGY PLAN

The Hawaii State Plan defines two major energy objectives:

> Dependable, efficient, and economical Statewide energy systems capable of supporting the needs of the people; and
>
> Increased energy self-sufficiency for Hawaii.

Specific information on projects do not relate to or address the Marina Zoning project site. Other policies and objectives are broad and relate to energy conservation and use of energy sources other than fossil fuels.

Energy conservation methods will be investigated for use in the project pertaining to the latest energy savings devices and installations which should result in some cost reduction as well as being conservation actions. Rideshare transportation measures, if implemented, should also conserve a considerable amount of energy and fossil fuel.

STATE TOURISM PLAN

This plan relates to tourism actions and does not address or relate directly with this project.

STATE WATER RESOURCES DEVELOPMENT PLAN

The primary objectives of the State Water Resources Development Plan are:

Regulations of the development and use of water to assure adequate supplies for the future;

Development of water resources to meet municipal, agricultural, and industrial requirements, and the reduction of flood damage; and

Preservation of water-related ecological, recreational, and aesthetic values and the quality of water resources.

This plan acknowledges that municipal water supply service is primarily a County function. To this extent, the developer has coordinated with the Board of Water Supply in addressing Marina Zoning's water needs. The proposed water system development for the project is not expected to be of any significant impact.

Water quality impacts on the adjacent marina and shoreline areas are expected to be minimal and in conformance with the objectives of the Plan.

V

PROBABLE ADVERSE EFFECTS

V. ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The following adverse environmental effects (both short- and long-term) cannot be avoided.

(1) The site-clearing and construction work will result in temporary fugitive dust, some disruption to traffic, and noise.

(2) Traffic will increase from the number of additional cars utilized by new residents of the proposed development. Additional impacts associated with increased traffic include potential air and noise quality deterioration. However, the developer's traffic consultant's findings indicate that implementation of the transportation management system, including the suggested roadway modifications will adequately accommodate the traffic to be created by the proposed development and rideshare measures proposed will minimize impacts considerably.

(3) The need for utility services will increase.

(4) The need for public services for fire and police protection, schools, and public recreational facilities will increase slightly.

VI

ALTERNATIVES

VI. ALTERNATIVES TO THE PROPOSED ACTION

For the purpose of this EIS, two alternatives to the proposed development were considered. These alternatives were: (1) no action alternative, (2) single family residential use only. These alternatives both of which are inconsistent with the City's East Honolulu Development Plan, are described and evaluated below. In view of the City's land use policy for the parcels, neither alternative provides a realistic option.

A. No Action Alternative

If selected, this alternative would result in no action being implemented. The impact of this alternative would be that the project site would remain as is. Eventually, the weeds and grasses would cover the entire lot and create visually undesireable and hazardous areas which would not be consistent with the surrounding areas.

This alternative was not found to be viable because its non-use would render the properties useless to developer and landowner. This "No-Action" alternative would be detrimental to the Hawaii Kai planned community. A tremendous waste of in-place infrastructure and utilities would result in terms of public facilities already built by the developer being under-utilized. In addition, No-Action would represent a blow to rational long-term land planning. City and State government would suffer also because employment, tax revenues, and housing supply would be lost.

B. Single Family Residential Alternative

This alternative, which would consist entirely of detached single family dwellings, has been rejected by the City for policy reasons. The cost of this type of dwelling would be beyond the reach of many home buyers and fewer housing units would be added to the deficient inventory.

VII

ENVIRONMENTAL RELATIONSHIPS

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY AND IRREVERSIBLE/IRRETRIEVABLE COMMITMENTS OF RESOURCES

It is anticipated that the construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, designing, engineering, construction labor, landscaping, and personnel for the sales, management, services, offices, and maintenance functions). Some of the construction materials could be reused if and when the structures are demolished; however, at the present time and state of our economy, it is felt that the reuse of much of these materials is not practical. Labor expended for this development is not retrievable. However, labor will be compensated during the various stages of the project by the developer, commercial businesses, and the building's management.

The appearance of the project sites will be altered from its present open space, vacant appearance to that of a completed residential community. Because flat terrain surrounds some of the project sites, the development will be highly visible but visually integrated with the surrounding areas.

Air and noise quality will be adversely affected by this proposed project, but will remain in compliance with State standards. Ambient air and noise quality in the area is relatively good. However, the proposed development will result in greater number of vehicles going to and from the project areas resulting in vehicular pollution emissions.

The project development will result in a commitment of land for a long-term period. Once low and medium density residential use is established, it is unlikely that the land will be reverted to a lower usage in the long-term future. Commitment of land for these purposes will also foreclose the future land use options of the land, such as recreational use, open space, agricultural use. However, it should be noted

that City planning of this land for apartment use has been approved and the present rezoning application implements the plan also and even if the proposed project did not occur, the high cost of the land (inherent in the zoning) would likely foreclose these lower land intensity uses.

The project development will, in the short- and long-term, result in residential uses which will likely benefit future homeowners, the landowner and private businesses.

VIII

GOVERNMENTAL POLICIES AND OFFSETTING INTERESTS

VIII. AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

The requested zoning is consistent with and will implement the land use policy of the City and County of Honolulu for East Honolulu as established in the Revised General Plan for Oahu and the East Honolulu Development Plan. The proposed project is also consistent with the current State land classification of Urban.

The developer intends to build and market quality apartment housing units in keeping with the Hawaii Kai master planned community. Open space, generous setbacks, lush landscaping, ample off-street parking, marina orientation, quality architecture and construction are all components which will reflect the continued quality of Hawaii Kai which will benefit both present and future residents of the community.

IX

LIST OF NECESSARY APPROVALS

IX. LIST OF NECESSARY APPROVALS

A change of zone request seeking A-1 and A-2 Apartment Zoning is currently being processed by the Department of Land Utilization for the designated project parcels. These changes, which will be consistent with all other land use regulations currently in effect, are all that are necessary for the planning requirements of the proposed project. Engineering approvals for subdivision, Drainage, Grading, and Utilities will be processed in their normal sequence.

X

CONSULTED PARTIES

X. ORGANIZATIONS AND AGENCIES CONSULTED DURING THE ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

City and County	Date of Comment	Date of Response
Board of Water Supply	6/18/85	NRN
Honolulu Fire Department	6/19/85	NRN
Department of Parks & Recreation	6/20/85	7/01/85
Department of Land Utilization	-	-
Building Department	6/10/85	NRN
Department of General Planning	6/07/85	7/01/85
Honolulu Police Department	6/10/85	7/01/85
Department of Transportation Services	-	-
Department of Public Works	6/10/85	7/01/85
Department of Housing and Community Development	6/18/85	7/01/85
State		
Department of Land & Natural Resources	-	-
Department of Planning & Economic Development	6/18/85	7/01/85
Department of Social Services & Housing	6/05/85	NRN
Department of Transportation	6/18/85	7/01/85
Water Resources Research Center	6/18/85	7/01/85
Office of Environmental Quality Control	-	-
Department of Education	6/25/85	NRN
Department of Health	6/18/85	7/01/85
Environmental Center	6/14/85	7/01/85
Community Organizations		
Hawaii Kai Neighborhood Board #1		
Quincy Kaneshiro	6/03/85	7/01/85
Dr. Robert V. Hallision	-	-
Stafford - Amis Morse	-	-
Bill Walden	-	-
Mary Wilkenson	-	-
Al Kirchner	-	-
Debra Willis	-	-
Anthony W. DePaul	-	-
Bill W. Kohlmann	-	-
E. Schuyler Lott	-	-
Rev. David Kennedy	-	-
Allan Wanamaku	-	-
Roy L. Benhan	-	-
Robert K. Takei Jr.	-	-
John T. McCarthy	-	-

Organizations and Agencies Consulted (Continued)

Community Organizations	Date of Comment	Date Response
American Lung Association	-	-
Outdoor Circle	-	-
Hawaii Kai Communities Council	-	-
Neighborhood Board #2	-	-
Bill Edwards - Koko Isle Association	05/21/85	NRN

NRN - NO RESPONSE NEEDED

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

June 18, 1985

Mr. F. J. Rodriguez, President
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Subject: Your Letter of May 31, 1985, on the Environmental Impact Statement Preparation Notice for the Marina Zoning Project at Hawaii Kai, TMK: 3-9-08:Por. 13, 3-9-08:16

Thank you for allowing us the opportunity to review and comment on the environmental document for the proposed rezoning of vacant land for apartment use.

We have no objections to the rezoning request. The availability of water will be determined when the building permits are submitted for our review and approval.

If you have any questions, please contact Lawrence Whang at 527-6138.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

NO RESPNSE NEEDED

JUN 21 1985

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

June 19, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

We have reviewed the Environmental Impact Statement Preparation Notice for the proposed Marina Zoning Project at Hawaii Kai and have no comments at this time.

Very truly yours,

FRANK K. KAHOOHANOHANO
Fire Chief

FKK:lm/KAW

NO RESPONSE NEEDED

JUN 21 1985

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

TOM T. NEKOTA
DIRECTOR

June 20, 1985

Mr. F. J. Rodrigues
Environmental Communications, Inc.
1146 Fort Street Mall, Suite 200
Honolulu, Hawaii 96809

Dear Mr. Rodrigues:

Subject: Environmental Impact Statement Preparation Notice
Marina Zoning Project - Hawaii Kai
TMK: 3-9-08 and 3-9-09

We have reviewed the proposed Marina Zoning project in Hawaii Kai and make the following comments and recommendation.

The report does not address the recreational impact that the proposed project would have on our public park system in Hawaii Kai. The 2400 residential units proposed to be built is very substantial and adequate open space and recreational facilities should be included in the applicant's plans for the project.

The report does acknowledge that the project will be required to comply with the Park Dedication Ordinance No. 4621. However, no description is provided as to how compliance with the Ordinance will be accomplished.

We recommend that the applicant directly contact our Department to discuss the project's recreational needs and park dedication requirements.

Should you have any questions, please call Mr. Jason Yuen at 527-6315.

Sincerely yours,

Tom Nekota

TOM T. NEKOTA, DIRECTOR

TTN:ct

JUN 25 1985

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Tom T. Nekota, Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Nekota:

We are in receipt of your comments dated June 20, 1985 on the proposed Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

The concerns expressed by your department on the anticipated impacts that the proposed zoning application will have on the existing parks system at Hawaii Kai have been reviewed by the developer. The draft EIS will discuss the availability of existing parks and recreational open space that are currently available, and their applicability to the proposed zoning request. This information has been provided to the DLU for their concurrent review in the Zoning Application. Your comments on this aspect of the draft EIS will be appreciated.

Thank you for your comments and we look forward to discussing this further with you and your staff.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL SUITE 200 • P. O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 531-5181

BUILDING DEPARTMENT

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

HERBERT K. MURAOKA
DIRECTOR
AND BUILDING SUPERINTENDENT

PB 85-568

June 10, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: EIS Preparation Notice
Marina Zoning Project at Hawaii Kai, Oahu

We have no comments on the proposed Marina Zoning Project at Hawaii Kai.

Thank you for the opportunity to review the subject EIS Preparation Notice.

Very truly yours,

FOR HERBERT K. MURAOKA
Director and Building Superintendent

cc: J. Harada

NO RESPONSE NEEDED

JUN 13 1985

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

DONALD A. CLEGG
CHIEF PLANNING OFFICER

GENE CONNELL
DEPUTY CHIEF PLANNING OFFICER

VW/DGP 6/85-1595

June 7, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Sir:

Environmental Impact Statement (EIS) Preparation Notice, Kaiser Development Company, Marina Zoning, Hawaii Kai

We have reviewed the subject EIS Preparation Notice and offer the following recommendations:

Item III.B.3. Traffic Generation on Kalanianaole Highway

We recommend that analysis be included to provide quantitative answers to the following questions:

1. What will be the impact of the 2,400 additional housing units in terms of the added traffic on Kalanianaole Highway during the morning rush traffic (7:00 - 9:00 A.M.) and the evening rush traffic (4:00 - 6:00 P.M.)? Quantify this impact in terms of added: (a) travel time from Hawaii Kai to Downtown Honolulu, (b) total costs/day for vehicle operation and drivers' time loss, and (c) air pollution, and (d) noise.

2. Will the proposed traffic management program mitigate these adverse impacts? Quantify all results anticipated. For example, how many fewer automobiles on Kalanianaole Highway are expected as a result of fully operational ride-sharing? Explain how this estimate is derived. Similarly, how many fewer automobiles can be anticipated on Kalanianaole Highway as a result of parking and riding the bus to Downtown Honolulu?

Item III.D.2. Affordable Housing in the Marina Zoning Development

The issue of affordable housing is not addressed; we recommend that the following data be supplied concerning the required 10% affordable housing:

1. Where will these 240 housing units be located.

2. What price range is planned for these units? Specify how many units at each price level?

Thank you for this opportunity to comment on this EIS Preparation Notice.

Sincerely,

Donald A. Clegg

DONALD A. CLEGG
Chief Planning Officer

cc: Mr. John P. Whalen, DLU

F. J. RODRIGUEZ
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

July 1, 1985

Mr. Donald A. Clegg
Chief Planning Officer
Department of General Planning
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

We are in receipt of your comments dated June 7, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

1. The impact of the additional housing units on the traffic conditions existing presently on Kalanianaole Highway are being analyzed by the retained traffic consultant, Wilbur Smith & Associates. Particular emphasis is being placed on the peak travel times of morning and evening. The issues of air pollution and noise also will be addressed in the draft EIS. The total costs/day for vehicle operation and driver's time resulting from the additional housing units is difficult to quantify since they depend on so many other factors. These were not addressed in the Transportation Management Study because one of the requirements of the study was to recommend mitigation measures such that when implemented, traffic would be better, or as a minimum, the same as it currently is.

2. The proposed traffic measures are designed to mitigate the adverse impacts resulting from the additional housing units. A detail explanation will be provided with the draft EIS. These are provided in Appendix C.

3. Fulfillment of the affordable housing requirement for the Marina Zoning presently is being discussed with the Department of Housing & Community Development. An assessment on the manner in which the requirement will be met is expected within the time frame of the Zoning Application process.

We look forward to your department's comments on the draft EIS on these matters.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL SUITE 200 • P. O. BOX 536 • HONOLULU HAWAII 96809 • TELEPHONE (808) 521-8181

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 941-1111

FRANK F. FASI
MAYOR

DOUGLAS G. GIBB
CHIEF

WARREN FERREIRA
DEPUTY CHIEF

IN REPLY REFER TO: ES-GF/DJA

June 10, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

We have reviewed the EIS preparation notice for the Marina Zoning project forwarded to us on May 31, 1985, and provide the following comments for your consideration.

1. An addition of this magnitude to the residential population of Hawaii Kai will mean an increase in calls for police service in the area. We cannot anticipate how great this increase will be; we can only react as it occurs.

2. Such a project will obviously cause further traffic congestion on Kalanianaole Highway. As the preparation notice points out, "traffic volumes . . . are approaching capacity at several critical intersections." Many drivers would probably contend that the roadway's capacity has already been exceeded. Therefore, we urge that planning for this project include ways to compensate for the increased volume of traffic on the highway.

Thank you for allowing us to comment on this matter.

Sincerely,

DOUGLAS G. GIBB
Chief of Police

By Warren Ferreira
WARREN FERREIRA
Deputy Chief of Police

JUN 17 1985

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Chief Douglas G. Gibb
Honolulu Police Department
1455 South Beretania Street
Honolulu, Hawaii 96814

Dear Chief Gibb:

We are in receipt of your department's comments dated June 10, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

1. The requirement for additional police manpower can best be evaluated on the phasing schedule for project implementation. A project of this size will by necessity, take a period of several years and it is felt that protective services such as police can maintain required capacity as project scheduling takes place. We appreciate your concerns that result in long range planning and CIP projections for increased manpower and physical plant.

2. Traffic generation and the mitigative measures that are proposed to alleviate this added impact attributable to the proposed project's traffic generation onto the Kalanianaole Highway are discussed in extensive detail by the retained traffic consultant, Wilbur Smith & Associates. Please be assured that this consideration and the impacts from added traffic generation are of vital concern to Hawaii Kai.

We look forward to your department's comments on the draft EIS. Thank you for your continuing interest and concerns.

Yours very truly,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1164 BISHOP STREET, SUITE 1614 • P.O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 536-2185

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RUSSELL L. SMITH, JR.
DIRECTOR AND CHIEF ENGINEER

ENV 85-132

June 10, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Re: Environmental Impact Statement Preparation Notice for the Proposed Marine Zoning Project
Hawaii Kai, Honolulu, Oahu, Hawaii

We are responding to your letter of May 31, 1985, requesting comments for the proposed project.

1. The proposed project is located within the tributary areas of the Hawaii Kai sewerage system. The owner(s) of this privately operated system will be responsible for any necessary relief sewers.

2. Municipal refuse collection services may be available for apartment buildings provided refuse is placed in three (3) cubic yard bins. These bins will be collected at no charge by the City if direct access to bins is provided along with turnarounds within the property. If direct access and turnarounds cannot be provided, private collectors must be hired.

Very truly yours,

RUSSELL L. SMITH, JR.
Director and Chief Engineer

JUN 17 1985

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Russell L. Smith, Jr.
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Smith:

We are in receipt of your department's comments dated June 10, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond as follows:

1. Sewerage systems required to accomodate the increased flow developed by the proposed 2400 units are anticipated to be adequately provided by existing master sewerage lines in place. Additional interceptor lines are to be designed in accordance with City & County standards suitable for dedication if necessary. Treatment will be done at the East Honolulu Community Services, Inc. Sewage treatment plant in accordance with existing requirements for treatment and disposal.

2. Requirements for municipal refuse collection indicated in your letter have been provided to the applicant and will be reviewed by both developer and architectural consultants. Compliance will be provided for either municipal collection or private systems.

Thank you for your comments and we look forward to your department's comments on the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1136 FORT STREET MALL, SUITE 200 • P.O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE NO. 536-2185

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

FRANK F. FASI
MAYOR

ALVIN K. H. PANG
DIRECTOR

June 18, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: Chapter 343, Hawaii Revised Statutes
Environmental Impact Statement Preparation Notice
Project: Marina Zoning, Hawaii Kai, Oahu
TMK: 3-9-08: Various Parcels
Area: 97± Acres
Existing Land Use: Vacant Land
Development Plans: Low and Medium Density Apartments
Zoning: Agriculture, Preservation and R-6 Residential
Proposal: Rezoning proposal for approximately 97± acres with approximately 2,400 residential units to be constructed over a period of seven years. Current Development Plan designates subject parcels (7) as either low or medium density apartment use. Rezoning request from existing R-6, P-1 and AG-1 to A-1 and A-2 apartment use. Developer (Kaiser) intends to build market quality apartment housing units.

Thank you for the opportunity to review and comment on the proposed rezoning application for the Marina project at Hawaii Kai, Oahu.

The plans, programs and projects of the Department of Housing and Community Development include the participation of private developers in providing housing for the low- and moderate-income families. The assistance of private developers is essential to alleviating the demand for affordable housing units.

As a condition to the approval of the proposed rezoning request, we recommend that the developer be required to set aside ten (10) percent of the units priced within the range of the low- and moderate-income families. This requirement applies to all zone change, cluster and planned development-housing application. Establishing such a request is

a reasonable means of recapturing the economic benefit conferred by favorable land use allocations and distributing that benefit for the general public benefit.

We are currently reviewing our policy relating to the ten (10) percent set aside and will inform you of any specific policy adjustment we adopt.

We would welcome the opportunity to assist the developer in formulating a program to provide these units. Please have the developer contact Mr. James Miyagi of this Department at 523-4264.

Thank you for bringing this application to our attention.

Sincerely,

ALVIN K. H. PANG

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL COMMUNICATIONS INC.

July 1, 1985

Mr. Alvin K.H. Pang, Director
Department of Housing and Community
Development
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Pang:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following: Your department's policy on requiring an affordable housing committant in connection with upzoning is understood. The developer has begun and will continue the process of working with your department to reach an appropriate affordable housing committant in connection with this pending zoning application.

Thank you for your comments and we look forward to your review of the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
KAMAMALU BUILDING, 250 SOUTH KING ST, HONOLULU, HAWAII
MAILING ADDRESS: P.O. BOX 2359, HONOLULU, HAWAII 96804 • TELEX: 7430250 HIDPED

GEORGE R. ARIYOSHI
GOVERNOR
KENT M. KEITH
DIRECTOR
MURRAY E. TOWILL
DEPUTY DIRECTOR
LINDA KAPUNIAI ROSEHILL
DEPUTY DIRECTOR

DIVISIONS
BUSINESS AND INDUSTRY DEVELOPMENT DIVISION
ENERGY DIVISION
FOREIGN-TRADE ZONE DIVISION
LAND USE DIVISION
PLANNING DIVISION
RESEARCH AND ECONOMIC ANALYSIS DIVISION
OFFICES
ADMINISTRATIVE SERVICES OFFICE
INFORMATION OFFICE

Ref. No. P-1867

June 18, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Subject: EISPN for the Proposed Marina Zoning Project at Hawaii Kai, Oahu

We have reviewed the subject environmental impact statement preparation notice (EISPN) and have the following comments.

The draft EIS should evaluate the traffic impacts to Kalanianaole Highway caused by this project and other proposed projects. The Oahu Metropolitan Planning Organization's Hali 2000 Study indicates that Kalanianaole Highway would have undesirable levels of congestion and delays at morning peak hour travel under six different alternatives including a transportation system management alternative. The draft EIS should also assess the relationship of the proposed project to the relevant objectives and policies of the Hawaii State Plan and State Functional Plans.

Thank you for the opportunity to review and comment on the subject preparation notice.

Very truly yours,

Murray E. Towill
Kent. M. Keith

cc: Office of Environmental Quality Control

JUN 21 1985

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Kent M. Keith, Director
Department of Planning and Economic Development
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Keith:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following: Traffic will be addressed in the Traffic Study provided by the consultant, Wilbur Smith & Associates. The Hali 2000 Study has been reviewed and mitigative measures to relieve congestion attributable to the additional units proposed are identified.

The proposed project's relationship with the State Plan and State Functional Plans will be incorporated into the Draft EIS.

Thank you for your comments and we look forward to your review of the Draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL, SUITE 200 • P.O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 521-8391

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY
P. O. BOX 17907
HONOLULU, HAWAII 96817

[redacted]
EXECUTIVE DIRECTOR

IN REPLY REFER

TO: 85:DEV/3064

June 5, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: Environmental Impact Statement - Marina Zoning Project at Hawaii Kai, Oahu

The Authority has reviewed subject EIS and has no comments to offer relative to the proposed action at this time.

Thank you for allowing us to comment on this matter.

Sincerely,

Russell N. Fukumoto
Executive Director

NO RESPONSE NEEDED

JUN 1 1985

GEORGE R. ARIYOSHI
GOVERNOR

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

WAYNE J. YAMASAKI
DIRECTOR

DEPUTY DIRECTORS
JONATHAN K. SHIMADA, Ph.D.
WALTER T.M. HO
CHERYL D. SOON
ADAM D. VINCENT

IN REPLY REFER TO

STP 8.10674

June 18, 1985

Mr. F.J. Rodriguez
President
Environmental Communications, Inc.
1146 Fort Street Mall, Suite 200
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Marina Zoning Project
Hawaii Kai, Oahu
EIS Preparation Notice

We concur in the City Department of Land Utilization's determination that an environmental statement is required.

We look forward to reviewing the traffic analysis based on a traffic management program consisting of roadway modifications and ridesharing measures. The analysis should also include a scenario without the ridesharing measures.

Very truly yours,

for Wayne J. Yamasaki
Director of Transportation

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Wayne J. Yamasaki, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Yamasaki:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

The traffic consultant, Wilbur Smith & Associates has been provided with a copy of your request for the different scenarios with and without the ridesharing measures.

Thank you for your comments and we look forward to your review of the draft EIS.

Very truly yours,

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL, SUITE 200 • P.O. BOX 535 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 537-3357

JUN 1985

University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 • 2540 Dole Street
Honolulu, Hawaii 96822

18 June 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

SUBJECT: Environmental Impact Statement Preparation Notice, Marina Zoning Project, Hawaii Kai, Oahu, Hawaii, June 1985

We have reviewed the subject EISPN and offer the following comment. Traffic impact analysis should include not only Kalanianaole Highway, but also the intersections of Hawaii Kai Drive at Keahole Street, Hawaii Kai Drive at Wailua Street, and Wailua Street at Lunalilo Home Road. The proposed project will affect all of these intersections.

Thank you for the opportunity to comment. This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator

ETM:jm

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Mr. Edwin T. Murabayashi
EIS Coordinator
Water Resources Research Center
University of Hawaii, Holmes Hall
2540 Dole Street
Honolulu, Hawaii 96822

Dear Mr. Murabayashi:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

The traffic concerns will be addressed in the section prepared by Wilbur Smith & Associates who have been retained to discuss impacts and proposed mitigative measures.

Your comments have been forwarded for their review. Thank you for your comment.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

Francis M. Hatanaka
[redacted] Superintendent
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXX

OFFICE OF BUSINESS SERVICES

June 25, 1985

Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

Dear Sir:

SUBJECT: EIS Preparation Notice

Our review of the rezoning proposal for 97+ acres in Hawaii Kai is projected to generate the following student enrollment:

SCHOOL	GRADE	APPROXIMATE ENROLLMENT
Haihaione Elementary	K-6	100 - 200
Koko Head Elementary	K-6	40 - 80
Kamiloiki Elementary	K-6	10 - 20
Niu Valley Intermediate	7-8	40 - 60
Kaiser High	9-12	70 - 110

All schools have sufficient capacity to accommodate the projected enrollment growth. As the development of the parcels will be phased in on a flexible schedule based on market demand, we would appreciate being kept informed of the scheduling so the use of classrooms can be adjusted to accommodate these students.

Should there be any questions, please contact Mr. Howard Lau at 737-4743.

Sincerely,

Vernon Honda
Assistant Superintendent

VH:BL:jl

cc: F. Hatanaka, Supt.
C. Suyat, Honolulu Dist.

NO RESPONSE NEEDED

JUN 27 1985

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

CHARLES G. CLARK
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
EPHSO

June 18, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear ~~Mr. Rodriguez~~ Fred:

Subject: Request for Comments on Environmental Impact Statement Preparation Notice for the Proposed Marina Zoning Project at Hawaii Kai

Thank you for the opportunity to review the Marina Zoning proposal which involves the development of 2,400 residential apartment units at seven sites in the Hawaii Kai area.

The Environmental Impact Statement should fully describe the sources or alternate sources of potable water for the seven sites and the quantity of water required for each area. In light of recent water shortages, the size and location of this proposal makes availability of water a critical issue. There are no potable water sources in the Hawaii Kai area. The current 8,000 plus residential units in the Hawaii Kai area receive potable water from the Board of Water Supply's Honolulu or Windward sources. Honolulu has been designated as a groundwater control area because water usage from Honolulu sources is rapidly approaching the sustainable yield of the aquifer. Pumpage limits have been identified and set for each Honolulu groundwater source. The sponsors of the project will need to consult both the Division of Water and Land Development of the Department of Land and Natural Resources, and the Honolulu Board of Water Supply about the availability of water for the Hawaii Kai Marina Project.

Please be advised that any new source of potable water developed to serve the project would be subject to approval by the Director of Health prior to its use as a potable water source. The new source and distribution system must comply with all applicable terms and conditions of Chapter 20, Title 11, Administrative Rules.

Careful consideration should be given to the potential for cross-connections between potable and nonpotable waterlines especially in the highrise buildings. In areas of potential contamination, proper backflow prevention devices should be installed on internal plumbing fixtures.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

Call me if I may be of assist.

JUN 20 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL COMMUNICATIONS INC.

July 1, 1985

Mr. Melvin K. Koizumi
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

We are in receipt of your department's comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

Water source development for the proposed project will be coordinated with the Board of Water Supply as the lead agency and the Department of Land & Natural Resources as the consulted agency of record. We will also be in contact with your agency for compliance with Chapter 20, Title 11, Administrative Rules.

Your concerns on potable and non-potable sources of water and possible cross connection are being reviewed by the developer and their architects to insure that in the event this may take place, adequate controls are initiated to prevent any contamination.

Thank you for your continuing concern and we look forward to your comments on the draft EIS.

Yours very truly,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

136 FORT STREET MALL SUITE 208 • P.O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE 536-5300

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

June 14, 1985

Mr. Fred J. Rodriguez
Environmental Communications
P.O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

EIS Preparation Notice
Hawaii Kai Marina Zoning Project
Honolulu, Oahu

The above cited preparation notice was reviewed by Jacquelin Miller of the Environmental Center. The following comments are offered for your consideration in the preparation of the Environmental Impact Statement.

Traffic

The proposed rezoning of several parcels (97 + acres), in the Hawaii Kai Marina area to permit approximately 2,400 residential units will result in considerable increase in the traffic on Kalananaole Highway and adjacent streets. We note that the increase in traffic on Kalanianaole Highway is to be analyzed in the EIS. We call attention to the need for analysis of increase in traffic on the tributary streets also. At the present time the left turn entry into Kuapa Kai Shopping Center by cars traveling makai is hazardous due to the short sight distance of cars coming over the hill traveling mauka. The intersection at Hawaii Kai Drive and Keahole Street is particularly hazardous and several accidents have occurred at that intersection. Similarly, the intersection of Wailua Street and Hawaii Kai Drive is hazardous at peak hours and will certainly be more so with the addition of the traffic from the 2,400 units. The DEIS should discuss appropriate measures to mitigate the increased traffic risks.

Pedestrian/Bicycle Safety

We also call attention to the need for an extension to the outside of the Keahole Street Bridge for pedestrians and bicycle use. The present sidewalk area is very narrow, the number of joggers and bicyclists is great, and the potential for accident on that bridge extremely high. Since Keahole Street will bear the major impact of this development, consideration should be given for ways to improve the existing hazardous conditions, lest they become critical with the added traffic.

Archaeological Sites

The preparation notice states that there are no known historical or archaeological sites of significance in the area. The description provided and figure 2 indicates that the proposed area will include construction on the mauka side of Hawaii Kai Drive between the Post Office and the existing Pacific Islands Club (formerly Hawaii Kai Recreation Center). There are a number of archaeological sites in that area, particularly the area just Koko Head of the Pacific Islands Club. We believe the Bishop Museum has conducted work there and should be consulted. It is our understanding that rock walls, house sites, and a well are present on the site.

Constructon Impacts

We note that construction is likely to take 7 years. One of the more serious concerns will be the dust problems during the initial ground preparation stages. Because of the prevailing strong trade winds in this area, and the fine texture of the dredged spoil fill surface material, fugitive dust has been a serious problem during previous construction periods. We suggest that the EIS address this issue and the mitigation measures that will be employed.

Special attention should be given to avoid pollutants entering the marina during the construction phase. Past experience has indicated that inadequately controlled runoff from freshly graded areas produces significant silting in the marina. Washdown of construction equipment, including on occasion concrete trucks and paint sprayers, has resulted in pollutants entering the marina through the storm drains.

Since most of the marina frontage houses are built on compacted fill, it is especially important to minimize blasting or pile driving. If either type of construction operation is anticipated, a soils engineer should be consulted for potential effects on nearby structures.

We appreciate the opportunity to comment on this preparation notice and look forward to receipt of the Draft EIS.

Yours truly,

Doak C. Cox

Doak C. Cox
Director

cc: OEQC
Jacquelin Miller

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Dr. Doak C. Cox, Director
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Dr. Cox:

We are in receipt of your office's comments dated June 14, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

1. Traffic - The applicant's traffic consultant, Wilbur Smith & Associates have prepared a comprehensive traffic impact study on the traffic generated from the proposed project as well as measures proposed to mitigate this added traffic load on Kalanianaole Highway along with key tributary streets within Hawaii Kai.

   Responses to your specific concerns are as follows:

   A. There is a traffic signal at the entrance to Kuapa Kai Shopping Centers to control/stop thru traffic to allow both left turns into and left turns out of the center. The location and design at this traffic control signal is in conformance with applicable design standards.

   B. The intersection at Hawaii Kai Drive and Keahole Street is a problem. The City & County is planning to install traffic control signals at this intersection by the end of 1985. Further, the Transportation Management Study has proposed realignment of this intersection to further improve its safety.

   C. The intersection at Wailua Street and Hawaii Kai Drive could be improved. The City & County is planning to install traffic control signals at this intersection also. The Transportation Management Study found that with the signal, the intersect would be adequate for the additional traffic from the Marina Zoning project.

2. Pedestrian/Bicycle Safety - Keahole Street Bridge has a 4' wide sidewalk on the Diamond Head side and an 8' wide sidewalk on the Koko Head side. Your concern will be forwarded to the City & County Department of Transportation Services for their review.

3. Archaeological Sites - A field survey has been done as part of this EIS with the results to be included in the draft EIS. Where sites are located in areas to be developed, they will be reviewed with the State

   Historic Preservation Office. If sites are located that meant preservation, development of the area will be controlled/limited to insure their preservation. The 5 acre area, "just Koko Head of the Pacific Islands Club" is not included in the Marina Zoning project but was included in the field survey to get a complete report for the area. A site meriting preservation was located in the 5 acre site (also extending into development tract Kaluanui 2 & 3) and restoration and preservation activities are under way.

4. Construction Impacts - are to be discussed in the draft EIS and we have added our concerns to those expressed in your comments to the developer. Hawaii Kai will coordinate the various impacts of fugitive dust, surface runoff, and possible blasting or pile driving with the architectural consultants as well as the construction contractors.

Thank you for your continuing concern and we look forward to your comments on the draft EIS.

Yours very truly,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

Environmental Communicatons, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

June 3, 1985

Re: Marina Zoning Project
Hawaii Kai, Oahu

Dear Ladies and Gentlemen:

Thank you for your letter of May 31, 1985, advising that an Environmental Impact Statement Preparation Notice has been filed with the Office of Environmental Quality Control of the State of Hawaii.

I am a recently re-elected member of the Hawaii Kai Neighborhood Board No. 1, and an active member of the Board's Transportation Committee, and represented the Board in a liason capacity with the Kaiser Developement Company.

I wish to emphasize the urgent need for improvement in items of traffic system management along the entire length of Kalanianaole Highway between Hawaii Kai and the H-1 freeway at Waialae. Additionally, physical improvements must be made on Kalanianaole Highway, prior to any further development commencing in Hawaii Kai.

Virtually no additional improvements have been made to the Kalanianaole traffic corridor prior to the present development in upper Kalama Valley, Kamehame Ridge, upper Kamiloiki Valley, development of additional commercial activity in the Kuapa Kai Shopping Center, development of upper Kuliouou Valley for affordable housing, construction of the new Maunalua Bay Club makai of Aina Haina, and continuing high enrollment at Kalani High School, and new development on Hawaii Loa Ridge.
Some of the items that are much-needed, and which have been repeatedly discussed at transportation forums, community meetings, Neighborhood Board meetings, developers' familiarization meetings, etc., but which have yet to be implemented and/or constructed are:

1. A pedestrian bridge over Kalanianaole Highway, fronting Kalani High School, preferably not near any of the exisiting traffic signal lights.

2. Adjustments to the timing of the three sets of traffic lights at Laukahi St., Kalani-Iki St., and Ainakoa Ave., at Kalanianaole Highway; extending the "synchronized timing" of the 6:30am to 8:30am traffic period to a "round-the-clock" basis. Much of the aggravation for drivers occur during so-called "off-peak" hours, wherein only one car coming down any one of these three streets to Kalanianaole Highway is now able to trigger the traffic lights, stopping dozens of vehicles on Kalanianaole Highway. The very persons wishing to minimize congestion during peak hours are now being penalized by minority traffic flow from side streets, and by pedestrians pressing the cross-walk light switches for "their convenience."

There are certain intersections at which the banning of left-turns, at all hours will improve traffic safety on Kalanianaole Highway. Some of these situations are: 1) The banning of all left-hand turns from Kalanianaole Highway into Hawaii Loa Ridge; 2) The banning of all left turns into Hawaii Loa Street in Niu Valley; 3) The banning of all left turns directly into the parking lot of the Niu Valley Shopping Center; 4) The banning of all left turns at Elelupe Road, and Kawaihae Street, until adequate left-hand deceleration and storage lanes can be created.

The additional development in Hawaii Kai should not be permitted until the above-described highway improvements are made. These improvements should be made prior to the major construction improvements to Kalanianaole Highway by the State DOT.

The "jug-handle" left-turn arrangement for Hawaii Loa Ridge should be implemented as soon as possible.

Additional pedestrian overpasses over Kalanianaole Highway should be constructed in Aina Haina, Niu Valley, and at the Holy Trinity Church.

In poll after poll of Hawaii Kai Residents, the traffic congestion along Kalanianaole Highway has been cited as the problem most needing rectification. This overall concern is greater than general community concerns about crime, housing, employment, ground lease rent problems, schooling, water and sewer services, electrical power dependability, and all other aspects of life in Hawaii Kai.

Yours sincerely,

Quincy H. Kaneshiro
612 Kapaia Street
Honolulu, Hawaii 96825
Tel: 395-8314

cc: Senator Buddy Soares
Representative Donna Ikeda
Representative Hal Jones
Councilmember Welcome Fawcett
Wayne Yamasaki, Director, State DOT
Bina Chun, Kaiser Development,
Director of Public Relations

QHK:djas

F. J. RODRIGUEZ
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

July 1, 1985

Mr. Quincy H. Kaneshiro
612 Kapala Street
Honolulu, Hawaii 96825

Dear Mr. Kaneshiro:

We are in receipt of your comments on the Environmental Impact Statement Preparation Notice dated June 3, 1985 and we respond as follows:

We share your concerns over the traffic situation at Hawaii Kai and Kalanianaole Highway and concur in your evaluation that the improvements are long overdue. Historically, the traffic improvements have not kept pace with the increased development in the East Honolulu District and this has led to nearly maximum capacity on the traffic corridor into Honolulu.

We appreciate the traffic mitigation measures identified in your letter that you indicate have already been discussed at various meetings but not yet implemented. Three of the four measures (adjustments to the timing at traffic lights and banning of left turns at certain intersections and implementing the jug handle left turn for Hawaii Loa Ridge) can be considered ongoing operational modifications and are not really dependent on the Marina Zoning project. These are suggestions that the Department of Transportation could review and implement at any time. We have forwarded a copy of your letter to the State Department of Transportation and the City & County Department of Transportation Services for their review.

The Transportation Study prepared for the Marina Zoning project identifies a number of roadway modifications to accommodate future traffic increases. One of these modifications is the remaining measure identified in your letter, the pedestrian bridge fronting Kalani High School.

The Transportation Management Study proposes that the traffic mitigation measures for the Marina Zoning (both roadway modifications and rideshare measures) be phased with development such that all increase of traffic will be accommodated. A proposed implementation schedule is included in the Transportation study that will be appended to the draft EIS. It must be pointed out, however, that prohibiting development in Hawaii Kai until highway impacts are made is not considered an acceptable alternative by the developer.

Thank you for your comments and we look forward to hearing from you on the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

[illegible]

Koko Isle
315 Koko Isle Circle, Honolulu, Hi 96825
(808) 395-3355

May 21, 1985

Kaiser Development Co.
P. O. Box 25007
Hawaii Kai, Hawaii 96825

Subject: Heights of Units Maka of Kuapa Kai Shopping Center

Dear Sirs:

In a recent Community Forum presented by Kaiser regarding development of the above subject, Kaiser presented a concept which indicated building heights of 60' on the waterfront development.

Over the past years, the Neighborhood Board #1 Zoning Committee and our Association pressed for an agreement to keep such height to 30' and 40'.

We wish to go on record opposing any height above 40' in this area of the Marina.

Yours truly;

Bill Edwards
President

BE/jp

cc Stafford Morse
NHB #1
Welcome Fawcett
file

NO RESPONSE NEEDED

JUN 27 1985

XI

COMMENTS RECEIVED ON DRAFT EIS

XI. ORGANIZATIONS AND AGENCIES CONSULTED DURING THE DRAFT ENVIRONMENTAL IMPACT STATEMENT REVIEW

Organizations/Agencies

City and County	Date of Comment	Date Comment Received	Date of Response
Board of Water Supply	7/19/85	7/24/85	NRN
Building Department	7/15/85	7/18/85	NRN
Dept. of Housing & Community Development	8/07/85	8/09/85	8/26/85
Dept. of General Planning	7/29/85	7/30/85	8/26/85
Dept. of Land Utilization	8/22/85	8/23/85	8/26/85
Dept. of Parks & Recreation	7/16/85	7/19/85	8/26/85
Dept. of Public Works	7/22/85	7/23/85	8/26/85
Dept. of Transportation Services	8/02/85	* 8/23/85	8/26/85
Fire Department	8/22/85	* 8/27/85	NRN
Police Dept.	7/17/85	7/19/85	NRN

State

Dept. of Agriculture	7/25/85	7/29/85	NRN
Dept. of Accounting & General Services	7/22/85	7/24/85	NRN
Dept. of Defense	7/17/85	7/18/85	NRN
Dept. of Health	8/05/85	8/08/85	8/26/85
Dept. of Land & Natural Resources	7/31/85	8/2/85	8/26/85
Dept. of Planning & Economic Development	8/01/85	8/06/85	8/26/85
Dept. of Social Services & Housing	-	-	-
Dept. of Transportation	8/26/85	* 8/28/85	
Office of Environmental Quality Control	7/29/85	8/02/85	8/26/85
State Energy Office	7/09/85	7/18/85	NRN
Environmental Center, U.H.	8/22/85	* 8/23/85	8/26/85
Marine Programs, U.H.	-	-	-
Water Resources Research Center, U.H.	7/26/85	8/05/85	NRN

Organization/Agencies (continued)

Federal	Date of Comment	Date Comment Received	Date of Response
Army-DAFE (Facilities Eng.-USASCH)	-	-	-
Navy	7/15/85	7/18/85	NRN
Soil Conservation Service	7/25/85	7/29/85	NRN
U.S. Army Corps of Engineers	-	-	-
U.S. Coast Guard	7/29/85	8/02/85	NRN
U.S. Fish and Wildlife Service	7/30/85	8/01/85	NRN
Organizations/Agencies			
American Lung Association	-	-	-
Hawaiian Electric Company	8/06/85	8/08/85	8/26/85
Office of Hawaiian Affairs	-	-	-
Hawaii Kai Neighborhood Board No. 1	8/21/85	8/22/85	9/03/85
Bishop Museum	-	-	-
Koko Isle Home Owners Association	8/22/85	* 8/26/85	8/26/85

* Received after August 22, 1985 deadline date
NRN - No Response Needed

HAWAII KAI

TRANSPORTATION MANAGEMENT STUDY

Prepared for

Kaiser Development Company

by

Wilbur Smith and Associates

September 3, 1985

CONTENTS

ILLUSTRATIONS

TABULATIONS

SUMMARY OF FINDINGS AND RECOMMENDATIONS

The purpose of this study is to identify future travel needs within the Hawaii Kai community and along the Kalanianaole Highway corridor between Hawaii Kai and the H-1 Freeway. This assessment reflects increased travel anticipated from: 1) additional residential and commercial development within Hawaii Kai; 2) other new developments identified in the East Honolulu area; and 3) increased tourist/recreational travel along Kalanianaole Highway.

The additional Hawaii Kai development being analyzed consists of two categories of projects. The first group includes parcels which have been previously zoned for residential use by the City and County of Honolulu(1). The second group, referred to hereinafter as the Marina Zoning parcels, includes projects for which the Kaiser Development Company is now requesting approval of zoning in order to implement the Development Plan. Location of the additional Hawaii Kai development is depicted in Figure 1. For purposes of this transportation analysis, the following unit counts are being used:(2)

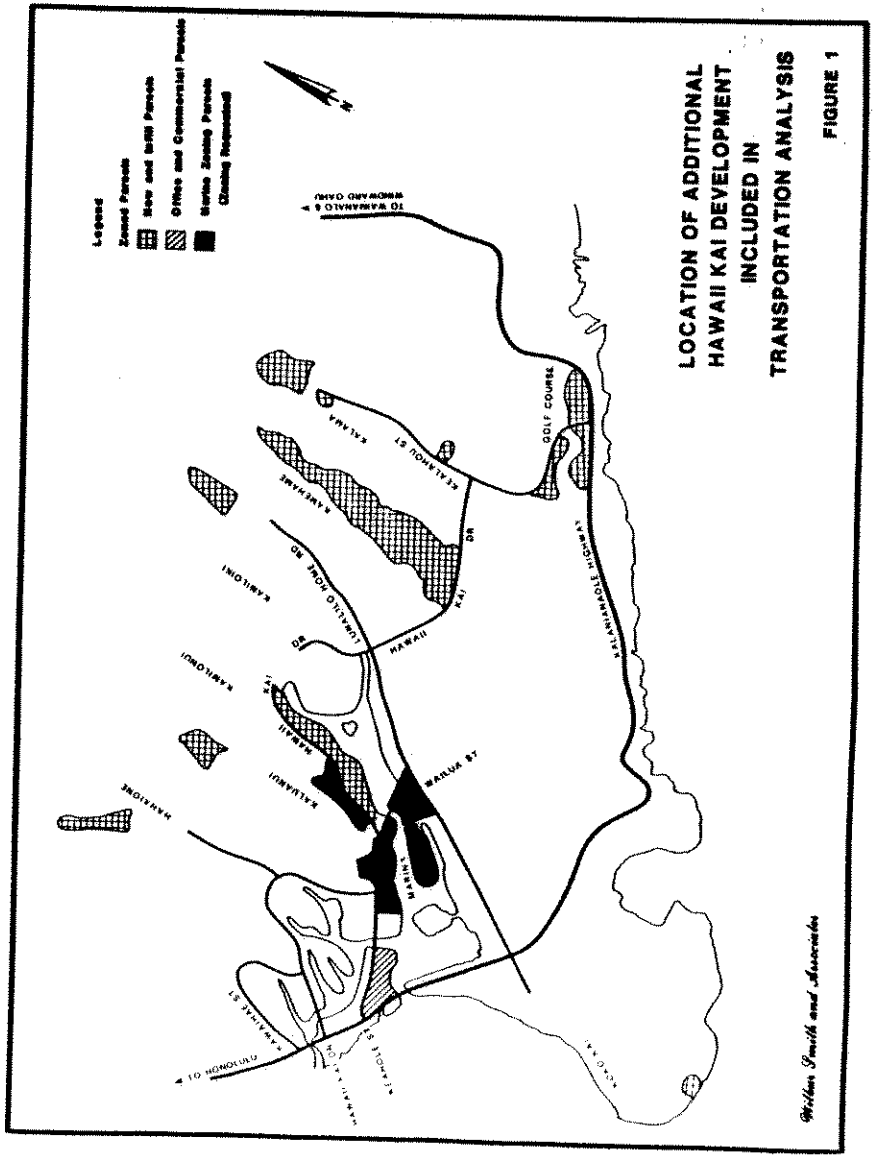
ADDITIONAL DEVELOPMENT	PREVIOUSLY ZONED PROJECTS	MARINA ZONING PROJECTS
Single-family Residences Under Construction	373	0
Vacant Zoned Lands	611	0
Multi-family Units	66	2,400
Offices (sq. ft.)	100,000	0
Commercial Space (sq. ft.)	233,000	0

This study recommends implementation of a transportation program which would accommodate the increased travel needs identified for the Kalanianaole Highway corridor. The proposals include both a program of ridesharing measures to encourage increased use of buses, vanpools and carpools, and roadway modifications to provide sufficient capacity at traffic bottlenecks.

---

(1) Vacant residentially zoned lands, tracts under construction and constructed but unsold units, e.g. Commodore condominium, are within this group.

(2) Actual development may differ. The number of units represents a realistic development program, and thus a realistic transportation analyses.



LOCATION OF ADDITIONAL HAWAII KAI DEVELOPMENT INCLUDED IN TRANSPORTATION ANALYSIS

FIGURE 1

STUDY ASSUMPTIONS AND ANALYSIS FRAMEWORK

The analysis of future travel needs and development of recommended rideshare and roadway programs reflect the following assumptions and guidelines:

- The travel forecasts assume incremental development and completion of the additional Hawaii Kai developments in 1994 and use this as the analysis year. Actual economic and real estate market conditions may shorten or lengthen this development period.

- The travel analysis assumes that TheBus public transit service to Hawaii Kai will increase proportionate to the future population increases and demands.

- Current and 1994 highway conditions were assessed through a volume-capacity analysis of the key intersections along Kalanianaole Highway and within Hawaii Kai for both the morning and evening peak traffic hours. These peak traffic hours are the one-hour morning and evening periods which experience the largest volume of traffic at each intersection, and which thus should represent the most severe congestion and delays at that location.

- The State of Hawaii Department of Transportation (State DOT) is presently planning a major roadway project along Kalanianaole Highway which would add two traffic lanes for high occupancy vehicles (HOV) in the roadway median between the H-1 Freeway and Hawaii Kai. This study's analysis does not incorporate the highway capacity increase which would result from construction of the State DOT median HOV lane project. The improvements recommended herein thus do not depend upon implementation of the State long-range project to accommodate the projected travel increases.

- The recommended improvements have been selected to be compatible with the longer-range development of the State DOT median HOV lanes project.

ANALYSIS FINDINGS

A number of significant findings resulted from the analyses of current and forecast travel. These findings were used to determine the type and location of proposed improvements.

Findings Relative to Current Conditions

1. Peak direction travel on Kalanianaole Highway by Hawaii Kai residents and visitors amount to 2,800 and 2,200 vehicle trips during the morning and evening peak traffic hours, respectively. Hawaii Kai trips comprise slightly over one-half of the peak hour traffic at the Ewa end of Kalanianaole Highway.

2. Hawaii Kai and East Honolulu usage of public transit is among the highest on Oahu, with nearly 20 percent of the morning peak hour, peak direction trips made by bus. This reflects the success of the Hawaii Kai express bus services.

3. Travel conditions on Kalanianaole Highway, as evidenced by travel speeds recorded in studies by the Oahu Metropolitan Planning Organization, are similar to those for other Oahu travel corridors.

4. During the morning peak hour, the peak direction traffic flow on Kalanianaole Highway is limited by the capacity constraints and resultant congestion at the Kalaniiki Street intersection. This intersection has the highest inbound (to Honolulu) volumes and is affected by cross street traffic and pedestrian volumes associated with Kalani High School. Other Kalanianaole Highway intersections could accommodate 5 to 30 percent more traffic before reaching the same level of congestion.

5. Less congestion occurs along Kalanianaole Highway during the evening peak hour, but motorists still encounter stop-and-go conditions in several sections. Disruptions to traffic flow primarily occur at three locations: at Ainakoa Avenue as a result of the merger of Kilauea on-ramp traffic into the through lanes; at East Halemaumau Street as a result of sidestreet traffic, pedestrian crossings and buses stopping in

the through lane; and in the Kuliouou/Elelupe Road area as a result of the large number of left-turns made from the through lanes.

Findings Relative to Future Conditions

1. The increases in Hawaii Kai traffic on Kalanianaole Highway, based on current travel mode usage, is estimated as follows:

LAND USE	MORNING PEAK HOUR Towards Honolulu	MORNING PEAK HOUR Towards Hawaii Kai	EVENING PEAK HOUR Towards Honolulu	EVENING PEAK HOUR Towards Hawaii Kai
Residential:				
Zoned Tracts	+430	+ 90	+150	+370
Marina Zoning	+460	+ 90	+190	+340
Zoned Commercial (3)	-100	+100	-180	-330
Net Increase	+790 (3)	+280	+160	+380 (3)
Current Trips	2,800	800	1,050	2,200

The expanded commercial development would attract many of the Hawaii Kai resident work and shopping trips which are currently made to the central Honolulu area, thus limiting the traffic increase on Kalanianaole Highway.

2. Without the recommended improvements, the Kalaniiki Street intersection would continue to constrain traffic movement on Kalanianaole Highway during the morning peak hour, with the additional traffic exceeding the intersection capacity by approximately 8 percent.

3. Without the recommended program, the increased traffic volumes on Kalanianaole Highway during the evening peak hour would exceed the intersection capacity at East Halemaumau, Kuliouou/Elelupe and Keahole Streets.

(3) Additional employment centers such as retirement community, commercial, high tech or other job creating uses that are presently being considered for other Hawaii Kai areas could further reduce the peak hour traffic shown above.

4. Within Hawaii Kai, the present major roadways would be sufficient to accommodate the increased traffic, with the exceptions of the Hawaii Kai Drive intersections with Keahole and Wailua Streets. During the morning peak hour, the heavy makai direction left-turns at these intersections would exceed the capacity of the present single left-turn lane.

RECOMMENDED TRANSPORTATION PROGRAM

The forecasts and findings were used to identify a transportation program to serve the increased travel needs for the proposed developments in Hawaii Kai as well as other identified East Honolulu developments and increased tourist/recreational traffic along Kalanianaole Highway. The proposed measures include implementation of an aggressive ridesharing program to promote higher vehicle occupancies, and therefore, more efficient use of the present roadway. A series of roadway modifications have also been identified to improve traffic conditions at those identified "bottleneck" and problem locations.

1. Ridesharing Program

The proposed ridesharing program, as outlined in Table 1, is intended to supplement TheBus services by providing new types of service, or direct service to new destinations not presently available. The broad range of recommended measures would expand rideshare accessibility to both present and new residents of Hawaii Kai.

2. Proposed Roadway Modifications

These projects are directed towards locations which would constrain future traffic flow. The proposed program emphasizes use of roadway projects which require minimum taking of right-of-way and use of government eminent domain powers, and which could be implemented within a two to three year period. These projects are identified in Table 2.

The program elements would complement the planned development of the State DOT's long-range corridor improvement project. Conversely, the transportation program can be implemented and would be sufficient to accommodate

Table 1

RECOMMENDED RIDESHARING PROGRAM

MEASURE	DESCRIPTION	RESULTS	IMPLEMENTATION COSTS[a]	ANNUAL OPERATING COSTS[a]
Transportation Manager for Hawaii Kai	Person to initiate, administer and promote rideshare measures and services.	Increases usage of services by 5%	$10,000	$40,000
Free Bus Passes to New Residents	Distributed to new Hawaii Kai residents for one year following move in for use on express buses.	Encourages 40% increase in express bus use.	---	Varies $7,000 to $17,000
Vanpools	Purchase of vans for vanpools in Hawaii Kai.	Estimated potential for 11 vanpools.	$17,000 per vanpool	0
Provide Park-and-Ride Facility	Provide parking and shelter for bus rides, vanpoolers, and carpoolers. Phase 1 - 140 spaces Phase 2 - 210 spaces (total)	Permit increased resident access to bus services.	$570,000[b] $180,000[b]	$25,000 to $30,000
Bicycle Lockers	Install at major bus stops.	Encourage use of bicycles to access bus services.	$20,000	---
Hawaii Kai Express Bus Club	Buspools from neighborhood to work location on monthly subscription basis.	Estimated potential for 5 buspools.	0	$25,000 subsidy per bus
Aina Haina - Niu Valley - Kuliouou Express Buses	Provide 3 express buses to Downtown Honolulu and and Waikiki/Ala Moana.	Would greatly reduce bus travel times over present service and attract increased patronage.	0	$35,000 subsidy per bus

(a) Preliminary cost estimates reflect 1984 unit cost factors.
(b) Land costs not included in estimate.

Table 2

RECOMMENDED ROADWAY MODIFICATIONS

LOCATION	DESCRIPTION	RESULTS	COSTS[a]
Pedestrian Overpass at Kalani High School	Construct over Kalanianaole Hwy. near Iki Place. Relocate makai bus stop to Iki Place and prohibit crossings at Kalaniiki and Laukahi Streets.	Increases signal green time available to Kalanianaole Highway traffic at Kalaniiki and Laukahi Streets.	$1,000,000[b]
Waikui Street & Kalanianaole Hwy.	Allow left-turn from Waikui St. in morning peak period.	Reduces left-turns and traffic queue lengths on Waieli St.	10,000
Kalanianaole Hwy. at Keahole St.	Widen the Koko Head direction to provide a second left turn lane to Keahole Street.	Reduces left-turn blockage of lanes and reduces delays to left-turn and through traffic in afternoon.	140,000
Hawaii Kai Drive at Keahole St.	Realign intersection to improve Keahole St./mauka Hawaii Kai Dr. approaches as the "through" street.	Improve traffic flow through intersection for heaviest morning and evening movements.	350,000
Hawaii Kai Drive at Wailua St.	Restripe Wailua St. to provide two Ewa direction lanes.	Provides two left-turn lanes for heaviest morning traffic movement.	20,000
Kalanianaole Hwy. Four-Lane Section	Improve makai-side bus pull-outs at East Halemauamu St. and Kuliouou Rd.	Permits buses to currently stop in through lane in afternoon.	20,000
Keahole Street	Widen to provide left-turn lanes; install and interconnect traffic signals.	Facilitates ingress-egress for park-and-ride facilities and Towne Center development. Interconnection reduces vehicle stops at signals.	485,000

(a) Preliminary cost estimates reflect 1984 unit cost factors.
(b) Includes land costs - $400,000.

the increased development independent of the State DOT's Kalanianaole Highway project.

EFFECTIVENESS OF MEASURES

The recommended transportation measures would accommodate the travel growth on Kalanianaole Highway that would result from the zoned and requested Hawaii Kai development, as well as the growth from other increases in corridor activities. This would be accomplished through a combination of fewer vehicle trips as a result of the ridesharing measures, and increases in corridor traffic capacity as a result of the roadway modifications at the "bottleneck" locations.

Implementation of the rideshare program is estimated to encourage a 20 percent increase in Hawaii Kai resident use of buses, vanpools, and carpools as compared to a continuation of current travel mode use. The estimated number of rideshare program participants and the reduction in vehicle trips on Kalanianaole Highway is summarized in the following table. The estimates are for peak hour, peak direction travel at full implementation of the program.

MEASURES	ADDITIONAL RIDERS		REDUCTION IN AUTO TRIPS	
	Morning	Evening	Morning	Evening
Free Bus Passes	60	40	30	30
Park-and-Ride Parking Spaces	70	55	55	45
Vanpools	110	85	65	50
Express Club Bus	200	160	110	85
Aina Haina/Niu Kuliouou Express	120	80	60	40
Bicycle Facilities	10	10	5	5
Transportation Manager	50	40	35	25
TOTAL	620	470	360	280

During the morning peak hour, the "bottleneck" location would be the Kalanianaole Highway intersection with Kalaniiki Street. As indicated in the following table, the rideshare measures, increased HOV lane use, pedestrian overpass, and traffic operation modifications would provide an equivalent increase in vehicle capacity to more than offset the estimated travel increase. These measures would permit movement of the additional trips through the bottleneck section while maintaining traffic flow similar to today's conditions.

The critical location during the evening peak hour would be the East Halemaumau Street intersection on the four-lane section of Kalanianaole Highway. The increase in the peak direction traffic (towards Hawaii Kai) is estimated at 140 vehicles, with implementation of the ridesharing measures. This increase can be accommodated within the capacity of the present facility.

	MORNING PEAK HOUR PEAK DIRECTION AT KALANIIKI (Vehicle Equivalents)	EVENING PEAK HOUR PEAK DIRECTION AT EAST HALEMAUMAU (Vehicle Equivalents)
Traffic Increase without Measures:		
Hawaii Kai	690	360
Other Developments	80	10
Recreation Trips	0	30
TOTAL	770	400
Compared to Capacity Increase:		
Rideshare Measures	360	260
Increase HOV Lane Use	120	0
Roadway Modification	375	0
TOTAL	855	260
NET CHANGE	-85	+140 (4)

Other Kalanianaole Highway intersections have sufficient capacity to accommodate both the morning and evening increases in peak hour traffic.

(4) Still can be accommodated within the capacity of the intersection.

This analysis does not include the additional lanes proposed in the State DOT's median HOV lane project. The two additional lanes would increase the peak direction traffic capacity at Kalaniiki Street during the morning peak hour and at East Halemaumau Street during the evening peak hour.

IMPLEMENTATION SCHEDULE AND COSTS

A tentative implementation schedule has been developed for the ridesharing and roadway measures which would generally provide additional capacity or increased ridesharing to offset the travel increases from the anticipated phasing of the new Hawaii Kai projects. The implementation schedule is based upon granting of final approval of the zoning request in mid-1986. Actual implementation would be scheduled to parallel the occupancy of the new residential units.

Ridesharing Measures

- The Transportation Manager would initiate rideshare coordination and marketing in mid-1986.
- Free bus passes would be distributed to initial occupants of the new Hawaii Kai residential developments between 1987 and 1994.
- Vanpool program would be initiated in 1987 and expanded as the number of drivers and riders increases.
- An initial 140-space park-and-ride facility would be opened in late 1987. Additional spaces would be added as needed, with 70 more spaces planned for 1990.
- The Hawaii Kai Express Club buses would initiate service in 1988, with service expanded to meet resident needs.
- The Aina Haina-Niu-Kuliouou express bus service would be initiated in 1991.

- Additional HOV lane permits should be issued by State DOT to increase HOV lane use during the morning peak hour by 120 vehicles.

Roadway Modifications

- Complete construction of the Kalani High School pedestrian overpass in 1988. In conjunction with the overpass, reactuate the Ainakoa Avenue/Waikui Street traffic signal during the morning peak period and allow left-turns from Waikui Street onto Kalanianaole Highway.
- On Hawaii Kai Drive, realign the Keahole Street intersection, and restripe the Wailua Street intersection in 1987.
- Provide double left-turn lanes from Kalanianaole Highway to Keahole Street in 1990.

Program Costs

Implementation and operating costs are summarized by program measure and year in Table 3. The funding of the program will not involve any cost to existing Hawaii Kai residents. Operating costs for ridesharing measures represent the "subsidy" requirement after an offset of the estimated club bus and vanpool revenues against the total operating costs.

Total program costs for the 1985 to 1994 period, expressed in 1984 dollars, are estimated as follows:

Ridesharing Measures	Capital	$ 967,000
	Operating	1,561,000
	Subtotal	$2,528,000
Roadway Projects	Capital	$2,025,000
	Operation	0
	Subtotal	$2,025,000
TOTAL PROGRAM		$4,553,000

Table 3

PROGRAM COSTS BY YEAR

(In Thousands of 1984 Dollars)

PROGRAM MEASURE	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
RIDESHARING:										
Transportation Manager										
Equipment Purchase	10									10
Operating Costs	20	40	40	40	40	40	40	40	40	340
Free Bus Passes	7	13	17	17	13	13	9	13	13	115
Park-and-Ride Facility										
Capital Costs	70	500				180				750
Operating Costs			25	25	25	30	30	30	30	195
Vanpools										
Capital Costs		68	34	17	17	17	17	17		187
Operating Costs		4	2	1	1	1	1	1		11
Express Bus Club			25	50	50	75	100	125	125	550
Kuliouou - Niu Express						35	105	105	105	350
Bicycle Facilities			15		5					20
SUBTOTAL	107	625	158	150	331	211	302	331	313	2,528

Table 3 (Continued)

PROGRAM COSTS BY YEAR

(In Thousands of 1984 Dollars)

PROGRAM MEASURE	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
ROADWAY:										
Kalani H.S. Pedestrian Overpass		400	600							1000
Kalanianaole Hwy./Keahole St.		140								140
Hawaii Kai Drive/Keahole St.		350								350
Hawaii Kai Drive/Wailua St.		20								20
Waikui/Kalanianaole Highway			10							10
Kalanianaole Hwy./Improve Bus Pullouts			20							20
Keahole St. Widening and Signals		25	460							485
SUBTOTAL		935	1,090							2,025
GRAND TOTAL	107	1,560	1,248	150	331	211	302	331	313	4,553

Chapter 1

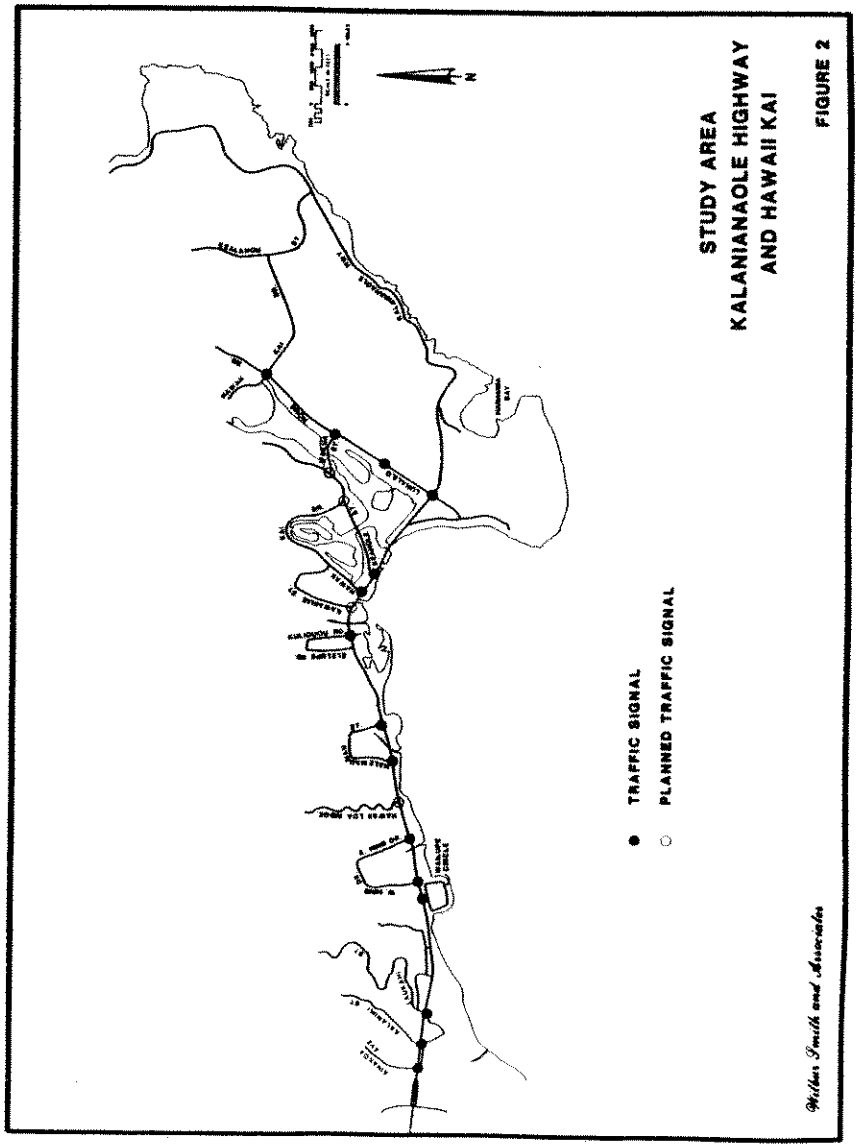
INTRODUCTION

The attractive physical setting, community values, and relative proximity to the major employment centers has resulted in a sizeable and growing residential population within the East Honolulu area. These attributes have led Hawaii Kai to become a major residential community, as have the East Honolulu communities of Waialae Iki, Aina Haina, Niu Valley and Kuliouou. (See Figure 2.) These East Honolulu communities had grown to 12,898 households in 1980. By the year 2000, the City and County of Honolulu Department of General Planning forecasts that the area will increase to 17,183 households, a 33 percent increase above the 1980 level.

Travel in the East Honolulu corridor is served by a single major traffic artery, the Kalanianaole Highway. Kalanianaole Highway connects the East Honolulu residential communities to Interstate Route H-1 and the major Honolulu employment centers, and to Windward Oahu. The residential nature of the area results in a heavy directional flow of commuter travel in the Ewa and Koko Head directions on Kalanianaole Highway during the morning and evening peak travel periods, respectively.

Peak direction traffic volumes during the morning peak hour have reached the present roadway's capacity at the traffic "bottleneck" near Kalani High School at the Ewa end of Kalanianaole Highway. During the evening peak hour, the peak direction traffic volumes are approaching the capacity of several locations along the four-lane section in the Niu Valley-Kuliouou areas. These constraints have encouraged changes in corridor travel characteristics to accommodate recent travel increases. Travellers during peak periods have changed their time of departure, thus lengthening the time periods which experience heavy (peak) traffic volumes, and have increased use of public transit and ridesharing.

To permit more efficient use of the Kalanianaole Highway facility, the Hawaii Department of Transportation (State DOT) has implemented a reversible lane operation between Hawaii Kai and Interstate H-1 during the morning peak



STUDY AREA
KALANIANAOLE HIGHWAY
AND HAWAII KAI

FIGURE 2

hour. Use of the reversible lane between Aina Haina and Interstate H-1 is restricted to high occupancy vehicles (HOV) to encourage use of buses and carpooling.

The State DOT plans to increase the capacity of Kalanianaole Highway by widening the roadway to provide two additional lanes within the median. These lanes will be reserved for HOVs, with both lanes operating inbound towards Honolulu during the morning peak travel period and outbound during the evening peak period. Engineering design is currently underway for the Kalanianaole Highway project, with completion of construction expected in the mid-1990s.

STUDY PURPOSE AND SCOPE

At present, development is proceeding in Hawaii Kai for 373 additional housing units on approved tracts, and a major expansion of office and commercial facilities within the Marina Business Center along Keahole Street. Planning is also being done for the remaining vacant zoned lands for an estimated 611 additional units. Kaiser Development Company is also requesting zoning to implement the Development Plan in additional residental tracts, referred to in this study as the Marina Zoning tracts. The Marina Zoning tracts could include as many as 2,400 new housing units. (See Figure 1 for location.) Development and occupancy of both the zoned tracts and Marina Zoning tracts could occur between 1986 and 1994.

The purpose of this study is to analyze the travel needs to accommodate this increase in Hawaii Kai development and activities, and to identify a transportation management program to serve these needs. The program encompasses three types of measures:

1. Ridesharing measures intended to attract increased use of buses, vanpools and carpools;

2. Traffic operational measures and minor roadway modifications to increase capacity of Kalanianaole Highway; and

3. Roadway modifications to improve circulation within Hawaii Kai.

This transportation study includes detailed travel forecasts and analysis within Hawaii Kai. Along Kalanianaole Highway, forecasts and analyses were made for those key intersections with heavy cross street traffic volumes or which pose current capacity constraints. Analyses were limited to the East Honolulu area since the dispersion of the additional Hawaii Kai trips outside this area would have only nominal impact on individual roadway travel conditions.

ANALYSIS APPROACH AND ASSUMPTIONS

The forecasting of travel needs and formulation of a transportation management program uses the following approach:

1. Increased travel for the additional Hawaii Kai developments was estimated based on a continuation of current travel characteristics, and added to existing (1984) travel.

2. Ridesharing program measures were identified and assessed relative to their potential to reduce the traffic increases. Traffic volumes were adjusted to reflect the estimated effectiveness of the proposed measures.

3. Traffic conditions were assessed for the key intersections, using the adjusted peak hour traffic volumes, and roadway and traffic operational changes were identified where appropriate.

The forecasts and evaluations were made for both the morning and evening peak travel hours.

Construction and occupancy of the new Hawaii Kai development, and thus the increase in traffic, has been assumed to occur between 1986 and 1994. For purposes of this study, the analyses are based on the current Kalanianaole Highway facility without the capacity increases and travel mode shifts which should result from the planned State DOT median reversible lane project. This permits the needs and timing of the Hawaii Kai development to be considered independent of the State's project.

The travel forecasts include the increases in Hawaii Kai trips both from the currently zoned tracts and from those tracts (Marina Zoning tracts) where zoning is being requested to conform with the Development Plan. The forecasts also reflect travel from other identified projects along Kalanianaole Highway and from increases in recreational travel to or through the area.

Chapter 2

EXISTING TRAVEL CONDITIONS

Information describing current roadway and transit use in the East Honolulu corridor has been obtained from counts made by the Hawaii Department of Transportation (State DOT) and the City and County of Honolulu Department of Transportation Services (City DTS). This information has been supplemented where necessary by counts and studies made by Wilbur Smith and Associates and Austin Tsutsumi and Associates for Kaiser Development Company.

The assessment of traffic conditions focuses upon the morning and evening peak hour traffic. The peak hour time period and traffic volumes represent the heaviest one-hour traffic volume at each individual intersection, rather than the use of a common one-hour period for all locations.

HAWAII KAI TRAVEL CHARACTERISTICS

Hawaii Kai has developed as a major residential area within the East Honolulu corridor with a diverse mix of residential, retail, office and community facility uses. Current residential development includes 5,185 single-family and 2,270 multi-family dwelling units. Other uses include the Kuapa Kai Center, Koko Marina and Hahaione commercial areas; the Hawaii Kai Medical and Office Center; Kaiser High School; and elementary schools, post office, parks, recreational center and other community service facilities.

The travel resulting from these current activities was used as the basis for the forecast of future travel volumes and characteristics.

Vehicle Trip Generation Rates

Average vehicle trip generation rates[1] were tested against the current traffic counts and trip distribution in Hawaii Kai. The selected rates, which

(1) Source: "Trip Generation," Institute of Transportation Engineers, Third Edition, 1982.

reasonably reflect current Hawaii Kai traffic generation during morning and evening peak hour periods, are presented in Table 4.

Based on these trip rates, an estimated 3,500 vehicle trips originated within Hawaii Kai during the morning peak hour, while 1,600 trips are made to Hawaii Kai destinations. These include all trips, whether made entirely within Hawaii Kai or to/from areas outside of Hawaii Kai. Evening peak hour travel totals 4,500 vehicle trips to and 3,000 trips from Hawaii Kai residential and commercial areas.

Trip Distribution

An analysis of distribution of Hawaii Kai trips to areas inside of the East Honolulu corridor was made using the results of the HALI 2000 travel data for 1980, and various telephone and roadside surveys conducted between 1977 and 1984. Based on these sources, the distribution of Hawaii Kai trips is estimated as follows:

DESTINATION	PERCENT OF HOME-BASED WORK TRIPS
Downtown	27
Waikiki	13
Ala Moana/Kakaako	14
University of Hawaii Area	8
Pearl Harbor/Hickam	10
Other	14
Within Hawaii Kai	6
Other East Honolulu Areas	8

Table 4

VEHICLE TRIP GENERATION RATES

LAND USE TYPE	TRIP RATE VARIABLE	AVERAGE VEHICLE TRIP RATE[a] Morning Peak Hour To (b)	Morning Peak Hour From (b)	Evening Peak Hour To	Evening Peak Hour From
Residential:					
Single-Family	Dwelling Unit	.21	.55	.63	.37
Low Density Multi-Family	Dwelling Unit	.10	.40	.40	.20
Medium Density Multi-Family	Dwelling Unit	.10	.20	.20	.20
Offices:	1,000 G.S.F.[c]	1.87	.22	.44	1.76
Commercial/Retail:	1,000 L.S.F.[d]	.40	.20	2.10	2.20

(a) Source: "Trip Generation," Institute of Transportation Engineers, Third Edition, 1982.
(b) "To" and "From" represents the vehicles entering or exiting and individual development regardless of whether the trip stays within Hawaii Kai or travels to points outside.
(c) Gross Square Feet of Floor Area.
(d) Net Leasable Square Feet of Floor Area.

Travel Mode Choice

The HALI 2000 Study estimated that approximately 8.7 percent of all weekday person trips made by East Honolulu residents in 1980 were made on public transit. This is the highest for any of the eight development plan areas and compares to an 8.2 percent average for Oahu.

Transit use is higher for the morning and evening peak travel periods when work and school trips comprise a major portion of the trips. Mode choice during the peak traffic hour is discussed in the following section.

Hawaii Kai Trips on Kalanianaole Highway

Approximately 2,800 vehicle trips generated by Hawaii Kai land uses enter onto Kalanianaole Highway for travel inbound towards Honolulu during the morning peak traffic hour. These trips represent 80 percent of the all vehicle trips generated by Hawaii Kai developments in the morning peak hour. Two percent of the trips travel to Windward Oahu via Kalanianaole Highway, while the remaining 18 percent travel to other points within Hawaii Kai. The Hawaii Kai trips inbound on Kalanianaole Highway, both by automobile and public transit, are summarized in the following Table 5.

Table 5
HAWAII KAI TRIPS INBOUND ON KALANIANAOLE HIGHWAY
Morning Peak Hour at Kawaihae Street

TRAVEL MODE	VEHICLES	PERSONS	PERCENT OF TOTAL PERSONS
Auto Drivers	2,800	2,800	54.4
Auto Passengers	0	1,400	27.1
Subtotal	2,800	4,200	81.5
Express Bus	12	570	11.1
Local Bus	7	380	7.4
Subtotal	19	950	18.5
TOTAL	2,819	5,150	100.0

The high automobile occupancy (average 1.5 persons per vehicle) largely reflects parents driving their children to school enroute to work. A major portion of local bus passengers are also school related--destined principally to Niu Intermediate School or Holy Trinity School.

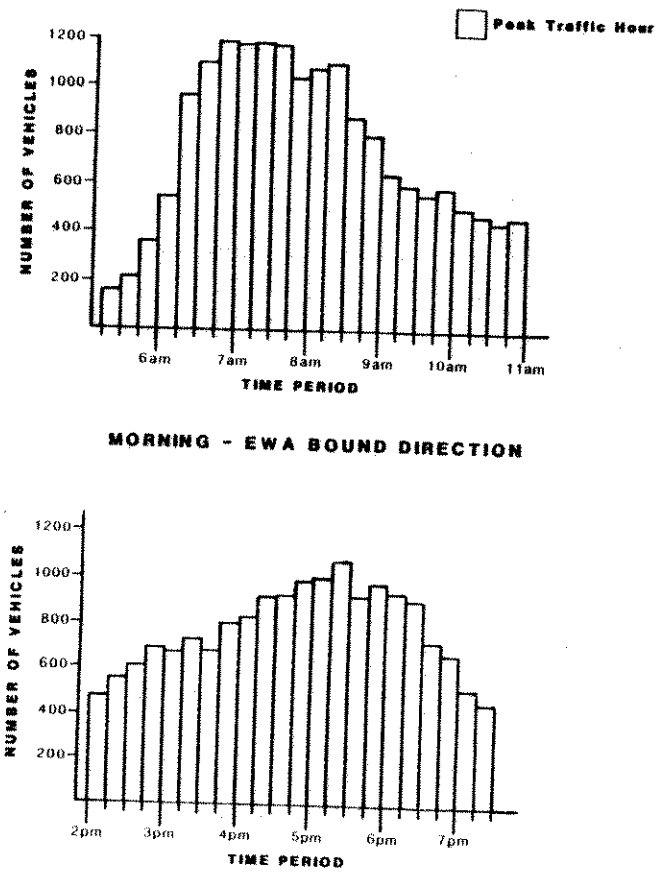
In the evening peak traffic period, the return trips to Hawaii Kai are spread over a longer period with a resultant lower peak one-hour volume. The evening peak hour vehicle trips to Hawaii Kai on Kalanianaole Highway totals 2,200 vehicles at Kawaihae Street.

KALANIANAOLE HIGHWAY TRAFFIC CONDITIONS

Kalanianaole Highway is a divided highway in a 120-foot wide right-of-way from the H-1 Freeway to Kirkwood Street. The divided section has three lanes in each direction Ewa of West Hind Drive, and three Ewa and two Koko Head direction lanes between West Hind Drive and Kirkwood Street. Between Kirkwood Street and Hawaii Kai, the roadway is a four-lane undivided highway, with left-turn lanes provided only at East Halemaumau, Hawaii Kai Drive, Keahole Street and Lunalilo Home Road.

Current roadway facilities and public transit services along Kalanianaole Highway are intensely used throughout the morning and evening peak travel periods. Traffic volumes have equaled or approached the capacity of the critical (bottleneck) intersections in recent years. This has resulted in a "spreading" of the peak traffic volumes over a long period, either by encouraging drivers to leave earlier or later than the highest volume period, or by slowing and metering traffic through the capacity constrained locations.

Kalanianaole Highway peak direction traffic flow is depicted in Figure 3 by 15-minute time increments for the highest volume location -- at Ainakoa Avenue. During the morning peak commute period, inbound traffic flow reaches volumes of 1,050 to 1,200 vehicles each 15-minute period between 6:30 and 8:30 a.m. During this period, traffic movement along Kalanianaole Highway is limited by the capacity of the Kalanianaole/Kalaniiki/Waieli Street intersection at Kalani High School, which produces the long traffic queues evident on school days.



KALANIANAOLE HIGHWAY PEAK DIRECTION TRAFFIC
BY 15-MINUTE PERIODS
Kokohead of Ainakoa Avenue

Wilbur Smith and Associates

FIGURE 3

During the afternoon peak period, peak direction traffic volumes at the Ewa end of Kalanianaole Highway are slightly lower than the morning volumes with a slow build up and decline of the volume during the peak period. The peak period volumes extend from 3:45 to 6:30 p.m., with 900 to 1,100 vehicles each 15-minute period.

Volume-Capacity/Level of Service Concept

The traffic-carrying capacity along a roadway is usually determined by the capacity and conflicting traffic volumes at its traffic signal-controlled intersections with other roadways. An intersection's capacity is primarily a function of the number and width of through and turn lanes, bus stop location and number of buses, proportion of traffic volumes which turn left or right, signal phases, and pedestrian conflicts. The capacity of an intersection can be determined by calculations using standard traffic analyses procedures, or by field observation if the intersection is presently operating at capacity.

The quality of traffic service provided by a roadway is measured in terms of the ratio of the traffic volumes which use the facility, to the roadway's capacity. The "Level of Service" concept is a standard means of describing traffic conditions associated with various ranges of volume-to-capacity ratios that which indicate the proportion of the intersections' practical capacity which is being used by the observed or estimated traffic volumes. The six levels of service (A through F) used to describe travel conditions, and the range of volume-to-capacity ratios for each, are described in Table 6.

The "Planning" method described in the Transportation Research Circular 212[2] was used to estimate capacities for each intersection.

Morning Peak Hour Traffic

Directional traffic volumes are depicted in Figure 4 for Kalanianaole Highway and for major streets intersecting with Kalanianaole Highway. The

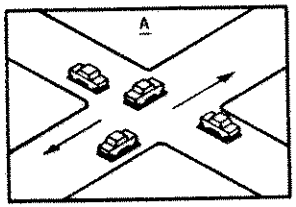
(2) Interim Materials on Highway Capacity, Circular 212, Transportation Research Board, 1980.

Table 6

INTERSECTION LEVEL OF SERVICE CONCEPT

LEVEL OF SERVICE A *Volume/Capacity Ratio= 0 - 0.59*

- Free flow conditions
- No vehicle waits longer than one signal indication

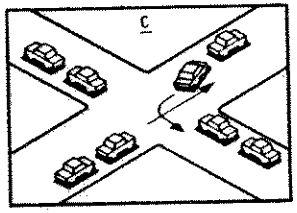


LEVEL OF SERVICE B *Volume/Capacity Ratio=0.60 - 0.69*

- Stable traffic flow
- Motorists rarely wait through more than one signal indication

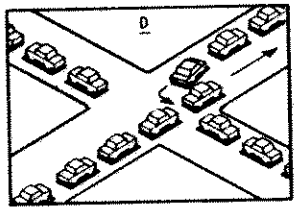
LEVEL OF SERVICE C *Volume/Capacity Ratio=0.70 - 0.79*

- Stable and acceptable flow but speed and maneuverability somewhat restricted due to higher volumes
- Motorists intermittently wait through more than one signal indication
- Occasional backups behind left turning vehicles



LEVEL OF SERVICE D *Volume/Capacity Ratio=0.80 - 0.89*

- Extensive delays at times
- Some motorists, especially left turners, may wait through one or more signal indications, but enough cycles with lower demand occur to prevent excessive backups
- Maneuverability restricted

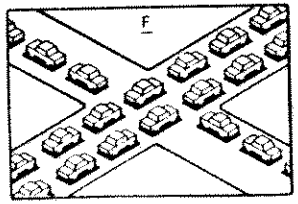


LEVEL OF SERVICE E *Volume/Capacity Ratio=0.90 - 0.99*

- Very long queues may create lengthy delays, especially for left turning vehicles
- Volume at or near capacity
- Unstable flow

LEVEL OF SERVICE F *Volume/Capacity Ratio=1.00 or greater*

- Backups from locations downstream restrict movement at intersection approaches
- Forced flow conditions
- Stoppage for long periods due to congestion
- Volumes drop to zero in extreme cases



volumes reflect the peak one-hour volume at each location during the morning peak traffic period.

Inbound peak hour volumes to Honolulu increase from approximately 3,000 vehicles in the Hawaii Kai area to some 4,500 vehicles prior to reaching Interstate H-1. Off-peak (Koko Head) direction volumes range between 500 and 900 vehicles. Highest cross street volumes occur on the major Hawaii Kai roadways and on West Hind Drive, Laukahi Street and Kalaniiki-Waieli Streets.

Estimated capacity utilization and Level of Service at the key intersections is presented in Table 7. Morning and evening peak hour traffic movements at these key intersections are presented in a separate technical appendix.

Ainakoa Avenue/Waikui Street - The traffic signal at this Kalanianaole Highway intersection is set to provide a continuous green indication to both Kalanianaole Highway directions during the morning peak traffic period, thus permitting nonstop flow. Conversely, Ainakoa Avenue and Waikui Street are restricted to only right turns in and out.

Kalaniiki-Waieli Streets - This intersection, located adjacent to Kalani High School, is the critical "bottleneck" which controls traffic flow on Kalanianaole Highway during the morning peak traffic period. This constraint results from: 1) the location at the Ewa end of Kalanianaole Highway where the largest inbound traffic flow to the Honolulu employment centers occur; and 2) the large proportion of time required to serve cross street traffic and pedestrian volumes.

Traffic volumes into and exiting from Kalani High School, and pedestrian volumes crossing Kalanianaole Highway to reach the school are the primary factors which limit the amount of traffic signal time available to the inbound traffic on Kalanianaole Highway. School begins at 8:00 a.m. with students and faculty arriving between 7:00 and 8:00 a.m. This coincides with the peak hour inbound traffic flow on Kalanianaole Highway, which extends from 6:45 to 7:45 a.m.

Table 7

EXISTING LEVEL OF SERVICE FOR KEY INTERSECTIONS

INTERSECTION	MORNING PEAK HOUR Volume-Capacity Ratio	MORNING PEAK HOUR Level of Service	EVENING PEAK HOUR Volume-Capacity Ratio	EVENING PEAK HOUR Level of Service
Kalanianaole/Ainakoa/Waikui	N/A	N/A	.93	E
Kalanianaole/Kalaniiki/Waieli	.99	E	.93	E
Kalanianaole/Laukahi/Waiholo	.95	E	.85	D
Kalanianaole/West Hind	.88	D	.86	D
Kalanianaole/East Halemaumau	.87	D	.93	E
Kalanianaole/Kulioouu	—	—	.90	E
Kalanianaole/Hawaii Kai Drive	.78	C	.64	B
Kalanianaole/Keahole	.76	C	.83	D
Kalanianaole/Lunalilo Home Rd.	.57	A	.74	C
Lunalilo Home Road/Wailua	.83	D	.56	A
Lunalilo Home Road/Hawaii Kai Drive	.74	C	.48	A
Hawaii Kai Dr./Keahole St.	.51	A	.57	A
Hawaii Kai Dr./Wailua St.	.90	E	.67	B

The traffic conflicts are worsened by the location of Kalani High School in the eastern portion of its population district. As a result, majority of the arriving students approach via automobile or bus from the west and must cross against the inbound traffic flow to reach the school on the mauka side of Kalanianaole Highway. Left turns from the Koko Head direction on Kalanianaole Highway are prohibited during the morning peak traffic period. Students approaching via automobile from this direction reach the school by one of several routes:

1. Most turn makai at Waikui Street (opposite Ainakoa Avenue), continue to Waieli Street, and proceed mauka through the Kalanianaole Highway intersection to reach the school entrance on Kalaniiki Street.

2. Some turn makai onto Waieli Street, make a U-turn at the end of the waiting traffic queue, and proceed mauka through the intersection to Kalaniiki Street.

3. Some parents drop off students at the Kalanianaole Highway makai-side bus stop, then proceed to and turn makai at Waiholo Street, make a U-turn on Waiholo Street, and then turn left onto Kalanianaole Highway to return to the Kahala-central Honolulu area.

4. Parents who drop students off on-campus generally exit onto Kalaniiki Street and turn right onto Kalanianaole Highway to return to the Kahala-central Honolulu area.

During the morning peak hour, approximately one-half of the traffic using both the Waieli and Kalaniiki Street approaches are travelling to or from Kalani High School.

Most students arriving by public transit alight at the makai side bus stop at Waieli Street, and then press the pedestrian button to actuate the special pedestrian crossing signal phase. Field observations found that the special "Walk" phase, which stops Kalanianaole Highway traffic for a 30-second period to allow time for pedestrians to cross, was activated for an average of 14 of 22 cycles during the peak traffic hour (6:45 - 7:45 a.m.) and 19 of 23 cycles between 7:00 and 8:00 a.m.

The pedestrian crossing phase stops Kalanianaole Highway traffic for 40 percent more time than that needed by Kalaniiki and Waieli Street traffic. The combined vehicles and pedestrian volumes associated with Kalani High School require 9 percent of the signal time.

Volume-capacity ratio for this intersection, as calculated using the Circular 212[3] procedures, is 1.18 for the morning peak hour. Since the actual capacity, as represented by the observed number of vehicles travelling through this intersection on Kalanianaole Highway and Kalaniiki/Waieli Streets, exceeds the calculated "theoretical" capacity, the "theoretical" capacity has been adjusted to reflect the observed capacity. This adjustment was also applied to the other intersections along the divided section of Kalanianaole Highway: Ainakoa Avenue, Laukahi Street and West Hind Drive.

Laukahi Street - Most of the morning inbound traffic from the Waialae Iki residential area use Laukahi Street to access Kalanianaole Highway. The large number of right-turns from Laukahi Street, which are permitted from both approach lanes, plus the left-turn traffic from Waiholo Street require a significant amount of signal time. However, lower inbound volumes on Kalanianaole Highway and fewer pedestrian crossings result in a lower utilization of this intersection's capacity than at the Kalaniiki Street intersection.

The Laukahi Street traffic is affected by the capacity constraint at Kalaniiki Street since the queue of Kalanianaole Highway traffic extends to and through Laukahi Street. The stopped inbound traffic queue on Kalanianaole Highway frequently blocks and delays the Laukahi Street traffic trying to turn inbound on Kalanianaole Highway.

West Hind Drive - West Hind Drive serves as the access point to Kalanianaole Highway for inbound traffic to the central Honolulu area from much of Aina Haina. West Hind Drive is restricted to right-turns at this T-intersection, which are made at the same time as the traffic signal permits movement of the left-turns from outbound Kalanianaole Highway. This overlapping of these conflicting movements minimizes the required signal time, thus affording most of the signal time to inbound Kalanianaole Highway traffic.

Hawaii Kai Intersections - The Hawaii Kai Drive, Keahole Street and Lunalilo Home Road intersections accommodate most of the Hawaii Kai traffic turning to travel inbound on Kalanianaole Highway. The large right-turn

(3) Ibid.

movements, with up to 900 right-turns during the peak hour at Keahole Street, do not cause any significant problems since through traffic on Kalanianaole Highway and conflicting traffic volumes are comparatively low in this area.

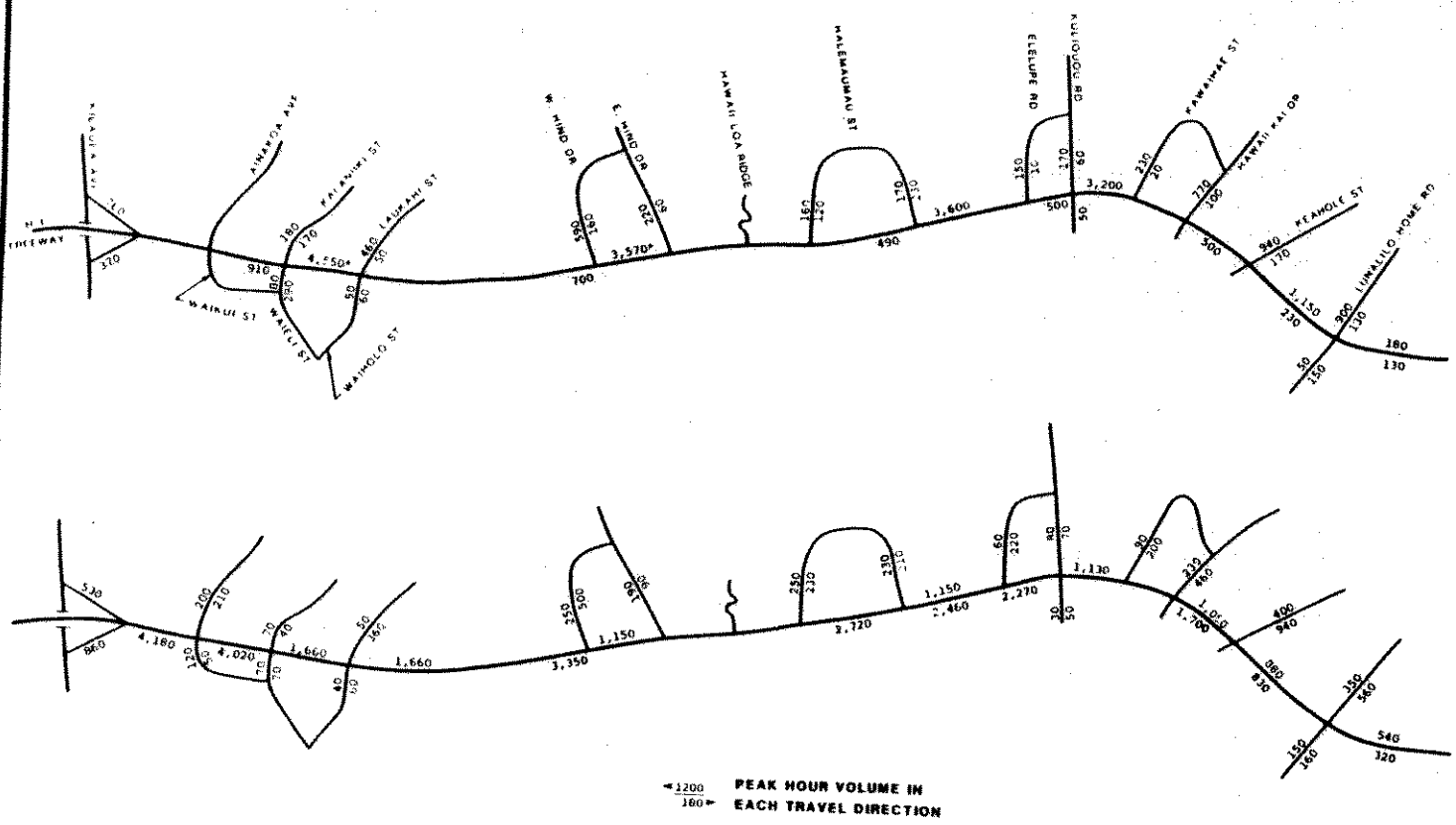
Evening Peak Hour Traffic

Peak direction traffic volumes along Kalanianaole Highway during the evening peak hour are generally 15 to 30 percent lower than the morning peak hour volumes at the same location, while the off-peak direction volumes tend to be double the morning off-peak direction volumes. As shown in Figure 4, cross street traffic volumes approximate the morning volumes, with the direction reversed. The principal exception is the low traffic volumes on Kalaniiki and Waieli Streets, which reflect the absence of school-related traffic in the evening peak hour.

Ainakoa/Waikui Streets - This intersection provides sufficient capacity to accommodate the heavy through and left-turn movements onto Koko Head-direction Kalanianaole Highway. Field observations indicate that Koko Head-direction traffic movement along this section of Kalanianaole Highway is often disrupted by the weaving of traffic from the Kilauea Avenue on-ramp into the through lanes. The weaving movement is adversely affected by the traffic signals at Ainakoa Avenue and Kalaniiki Street since the stopped Kalanianaole Highway traffic queue often extends beyond the ramp entrance. This blockage reduces the number of Kilauea ramp vehicles that can merge into the Kalanianaole Highway through traffic and results in extensive queueing of traffic on the on-ramp.

Kalaniiki/Waieli Streets - This intersection does not experience any problems during the evening peak traffic period since school traffic has exited earlier.

Laukahi/Waiholo Streets - This intersection does not experience any congestion in the evening peak hour despite the heavy outbound through traffic and left-turn to Laukahi Street (290 vehicles). This is because of the comparatively low opposing traffic volumes inbound on Kalanianaole Highway and on Laukahi and Waiholo Streets.



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EXISTING PEAK HOUR TRAFFIC, KALANIANAOLE HIGHWAY

FIGURE 4

West Hind Drive - The Koko Head-direction roadway narrows from three through lanes to two lanes by dropping the outside (makai) traffic lane at this intersection. The lane reduction, without any extension beyond the intersection, results in little use of the outside traffic lane by traffic approaching the intersection. The intersection operates at an acceptable level of service, even with the combination of heavy through traffic volumes and lane reduction, since the T-intersection and restriction of left-turns from West Hind Drive permits almost continuous Koko Head-direction traffic flow. Koko Head direction traffic is stopped only for pedestrian crossings.

An extremely large number of left turns (500 vehicles) are made from outbound Kalanianaole Highway to West Hind Drive. However, the intersection can easily accommodate this volume since there is relatively low opposing inbound traffic on Kalanianaole Highway and West Hind Drive traffic is restricted to right turns.

East Halemaumau Street - At times, this T-intersection provides the capacity constraint along the four-lane section of Kalanianaole Highway. The intersection constraint during the evening peak hour is a function of several factors:

1. Heavy outbound through traffic volumes;
2. Heavy left-turn movement from East Halemaumau Street;
3. Frequent stops by outbound local buses to pick up/discharge passengers, with the stops made in the through traffic lane; and
4. Frequent pedestrian crossings of Kalanianaole Highway through activation of the pedestrian "Walk" phase on the signal. The pedestrian walk phase provides approximately three percent more signal green time to the East Halemaumau approach than needed by the traffic volume.

Elelupe and Kuliouou Roads - Since there is no separate left-turn lane, left-turns have been prohibited from Koko Head-direction Kalanianaole Highway at Kuliouou Road. The left-turns are intended to be made by a "jug-handle" movement: right-turn onto Paeoki Drive, proceed on Summer Street to Kuliouou

Road, and then travel on Kuliouou Road through the Kalanianaole intersection to reach the mauka area of Kuliouou Valley. The route is reasonably direct, but does require a sometimes lengthy wait at the traffic signal.

As a result, most outbound traffic destined to Kuliouou Valley now turn left at Elelupe Road: 190 left-turns counted at Elelupe Road in the evening peak traffic hour versus 20 "through" vehicles counted mauka-bound on Kuliouou Road at Kalanianaole Highway. Since there is no left-turn storage lane, vehicles turning left at Elelupe Road stop and wait in the through lane for a gap in the opposing traffic flow, thus blocking traffic movement in the inside through lane. Field studies during the evening peak hour found that stopped left-turn vehicles blocked the inside lane at Elelupe Road for 22 percent of the time in which traffic was proceeding through the Kuliouou Road signalized intersection. This, in effect, reduces the capacity of Kalanianaole Highway at this location by about 10 percent.

Other Mauka Streets - The problem of left-turn vehicles blocking one of the outbound through traffic lanes also occurs at several other intersections where there is no left-turn storage lane. These include Hawaii Loa Street, Moomuku Place, and Kawaihae Street. The number of left turns are far less at most of these streets and create fewer delays than at Elelupe Road. At Kawaihae Street, State DOT plans are to install a traffic signal and prohibit left-turns from Kalanianaole Highway.

Keahole Street - Keahole Street accommodates the largest number of outbound left-turns (750 during evening peak hour) from Kalanianaole Highway into Hawaii Kai. The present intersection layout and traffic signal timing can accommodate this movement. However, the waiting queue of left-turn vehicles frequently extends beyond the left-turn storage lane, thus blocking a through lane on Kalanianaole Highway, and extending through and blocking the Hawaii Kai Drive intersection.

HAWAII KAI ROADWAY CONDITIONS

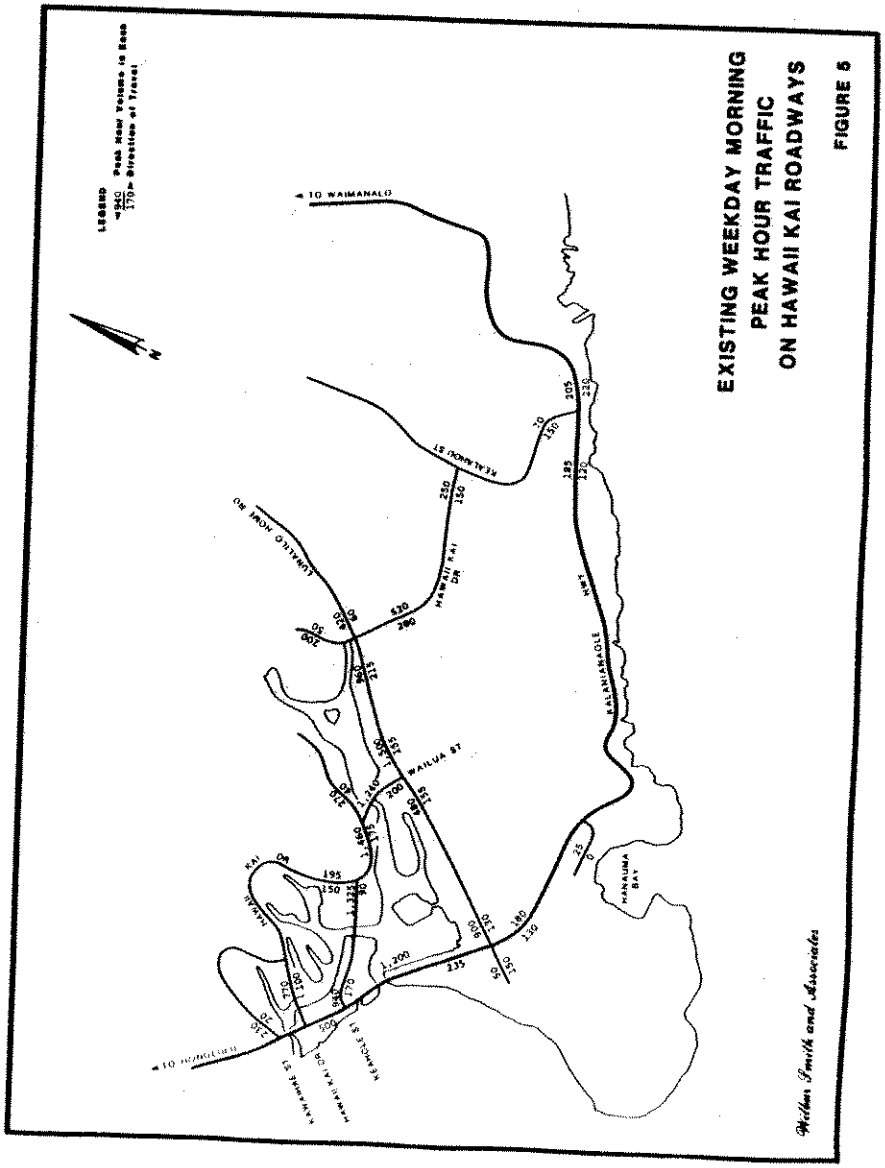
Hawaii Kai roadways provide sufficient capacity to accommodate present traffic volumes during morning and evening peak traffic periods. Morning peak

hour traffic volumes are presented in Figure 5, evening peak hour volumes in Figure 6. The volume-capacity analyses for the key intersections are included in Table 7.

The principal problem observed in Hawaii Kai during the morning peak period is the large volume of makai direction commuter traffic which follows a route using Lunalilo Home Road, Wailua Street, Hawaii Kai Drive and Keahole Street. This route results in an Ewa-direction right-turn movement of almost 1,200 vehicles from Lunalilo Home Road to Wailua Street, and a similar number of left turns at the Hawaii Kai Drive intersections with Wailua and Keahole Streets. The left-turn volumes are approaching the capacity of the two Hawaii Kai Drive intersections, given the present physical layout and traffic controls, since the left-turn movement is made from a single lane.

The return movement in the evening peak hour results in right turn volumes of more than 900 vehicles at the Hawaii Kai Drive intersections with Keahole and Wailua Streets. The lower volume and the fewer conflicts with the right turn movement enable the evening movement to be made with less disruption. The afternoon return movement does result in a heavy mauka-bound left turn (830 vehicles) from Wailua Street to Lunalilo Home Road. However, two left-turn lanes are provided to accommodate this movement.

The City and County of Honolulu Department of Transportation Services plans to install traffic signals in the next year at the Hawaii Kai Drive intersections with Keahole and Wailua Streets to improve operations for the heavy directional movement. The Hawaii Kai Drive-Keahole Street intersection will also be restriped and traffic islands added to realign the Keahole Street and the mauka Hawaii Kai Drive approaches as the through street; the Ewa approach of Hawaii Kai Drive will become the side street. The volume-capacity analyses in Table 7 reflect these changes. The Hawaii Kai Drive-Wailua Street intersection will operate at Level of Service E during the morning since the heavy left-turn movement will continue to be made from a single lane.



EXISTING WEEKDAY MORNING PEAK HOUR TRAFFIC ON HAWAII KAI ROADWAYS

FIGURE 5

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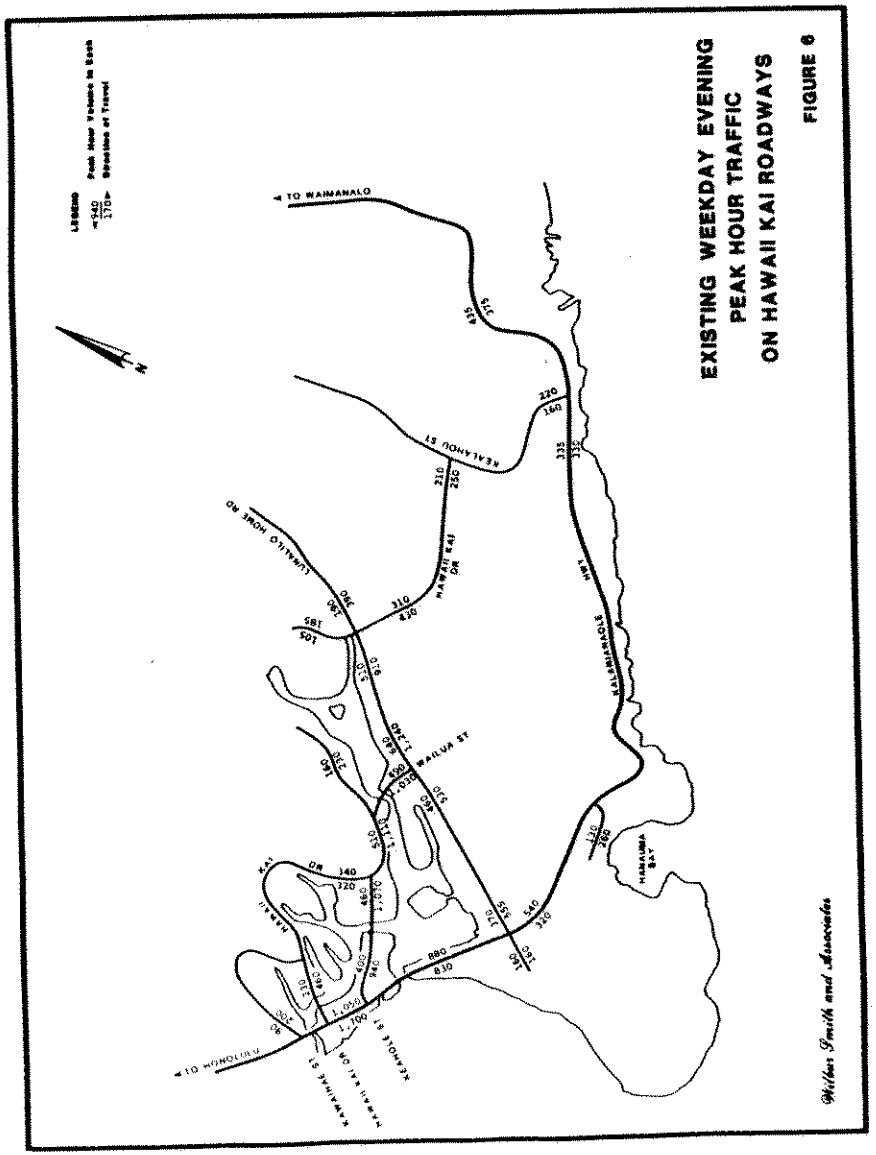


Chapter 3

FUTURE DEVELOPMENT AND TRAVEL

Estimates of future Hawaii Kai travel reflect the infill and build-out of the residential tracts currently in the development phase, plus the development of 2,400 residential units in the Marina Zoning tracts where zoning is being requested to implement the Development Plan. Locations of both the approved tracts and the Marina Zoning tracts are depicted in Figure 1 on page 2. The travel forecasts also include the expansion of Marina Business Center office and commercial retail activities. The forecast year is 1994, which reflects the anticipated year for completion and occupancy of these developments.

The travel forecasts presented in this chapter reflect a continuation of current travel characteristics: travel mode choice, vehicle occupancy, and time of travel. Trip distribution has been modified as appropriate to reflect the increased office and commercial uses.

The travel projections also identify increased "through" recreational trips on Kalanianaole Highway, and travel increases from other identified development in East Honolulu.

HAWAII KAI DEVELOPMENT AND TRAVEL

Proposed Development

Under present zoning an additional 1,050 new residential units will be constructed and/or sold in of Hawaii Kai. These include occupancy of vacant units, construction of infill units on vacant lots, and the development of several new tracts. These units include 984 single family and 66 multifamily units (Table 8).

Within the 10-year time frame of this study, the Kaiser Development Company also expects several additional phases of development to occur within the Marina Business Center. Implementation of these developments will be

Table 8

ADDITIONAL HAWAII KAI DEVELOPMENT
USED IN THE TRANSPORTATION ANALYSIS PERIOD
1985-1994

LAND USE TYPE	VARIABLE	EXISTING	ADDITIONAL Approved (a)	ADDITIONAL New Zoning (b)	ADDITIONAL Combined	TOTAL	PERCENT INCREASE ABOVE EXISTING
Residential:							
Single Family	Dwellings	5,185	984	0	984	6,169	19
Low Density Multifamily	Dwellings	1,100	0	470	470	1,570	43
Medium Density Multifamily	Dwellings	1,170	66	1,930	1,996	3,166	170
TOTAL RESIDENTIAL	Dwellings	7,455	1,050	2,400	3,450	10,905	46
Offices:	1,000 GSF	20	100	0	100	120	500
Commercial Retail	1,000 GSF	320	233	0	233	553	73

(a) Developments with approved plans and permits.
(b) Tracts in which zoning is requested to implement Development Plan.

phased throughout the period. By 1994, the additional development is expected to total 100,000 square feet of office facilities and 233,000 square feet of commercial retail uses.

Kaiser Development Company is requesting zoning approval, in order to conform to the Development Plan, for additional residential development beyond the current projects. The tracts included in the zoning requests, referred to herein as the Marina Zoning tracts, include multifamily developments which are estimated to total 2,400 units. These multifamily projects will be primarily located in the areas along Hawaii Kai Drive and Wailua Street adjacent to the Hawaii Kai Marina.

Hawaii Kai Travel Increases

Vehicle Trip Generation - The increased number of vehicle trips generated by the additional Hawaii Kai developments were estimated using the trip generation rates identified in Table 4 (Chapter 2). These trip rates reflect a continuation of current travel characteristics. The number of trips generated by present residential areas are expected to remain at current levels.

The application of these trip generation rates to the anticipated additional residential units and commercial developments would result in an approximate 40 percent increase above the traffic generated by existing Hawaii Kai development. As summarized in Table 9, traffic increases generated by the additional developments are estimated to total 1,900 vehicle trip ends during the morning peak hour and 3,230 vehicle trip ends during the evening peak hour. These additional vehicle trips include both trips made within Hawaii Kai and those made to locations outside Hawaii Kai.

During the morning peak hour, the approved projects contribute 58 percent of the increase in vehicle trips while the Marina zoning request projects comprise 42 percent. The approved and zoning request projects would comprise 68 and 32 percent, respectively, of the evening increase.

Vehicle Trip Distribution - The distribution of vehicle trips between areas within Hawaii Kai and to outside locations was based on both an analysis of present characteristics and the findings of previous studies. The prin-

Table 9

ESTIMATED 1994 INCREASE IN VEHICLE TRIPS
FOR NEW HAWAII KAI DEVELOPMENT

LAND USE CATEGORY	MORNING PEAK HOUR To The Project[a]	MORNING PEAK HOUR From The Project[b]	EVENING PEAK HOUR To The Project[a]	EVENING PEAK HOUR From The Project[b]
NEW RESIDENCES IN ZONED TRACTS				
Single Family	205	525	605	355
Multifamily	5	15	15	15
Subtotal	210	540	620	370
EXPANSION OF MARINA BUSINESS CENTER				
Shopping Center	90	50	480	500
Offices	190	20	40	180
Subtotal	280	70	520	680
SUBTOTAL FOR APPROVED PROJECTS	490	610	1,140	1,050
RESIDENTIAL PROJECTS IN MARINA ZONING TRACTS				
Low Rise Multifamily	45	190	190	90
Medium Density Multifamily	185	380	380	380
SUBTOTAL FOR MARINA ZONING	230	570	570	470
TOTAL INCREASE	720	1,180	1,710	1,520

[a] All vehicle trips ending at the new project.
[b] All vehicle trips beginning at the new project, whether destined to points within or outside of Hawaii Kai.

1. The additional residential units would make the same number of trips within Hawaii Kai to the existing convenience stores, service establishments, and schools and community facilities as does existing residential units.

2. The origin/destination of trips from the expanded Marina Business Center office/retail development would be as projected in the 1977 traffic study for the project:[1]

TRAVEL TO/FROM	PROPORTION OF TRIPS Office	PROPORTION OF TRIPS Shopping Center
Kalanianaole Highway to/from Windward direction	2%	3%
Kalanianaole Highway to/from Ewa direction	68%	18%
Within Hawaii Kai	30%	79%
	100%	100%

3. The number of internal trips made within Hawaii Kai by residents would increase as a result of the number of work and shopping trips attracted to the additional Marina Business Center office and retail activities. This adjustment is appropriate since the expansion is expected to include a department store and/or other retail activities not available at present in Hawaii Kai, as well as additional job opportunities.

   The trips to and from the central Honolulu area, where residents travel for such functions at present, were reduced to reflect "diversion" of these trips to the Marina Business Center. The reduction in Kalanianaole Highway vehicle trips by Hawaii Kai residents is estimated as follows:

(1) Alan M. Voorhees & Associates, Traffic Impact Analysis, Marina Business Centers 1 & 2 and Kamilomui Light Industrial Park, prepared for Kaiser-Aetna, 1977.

	TO HAWAII KAI FROM HONOLULU	FROM HAWAII KAI TO HONOLULU
Morning Peak Hour	-50	-140
Evening Peak Hour	-450	-390

The resultant trip distribution for the additional Hawaii Kai travel to, from and within Hawaii Kai, which reflects the above adjustments, is summarized in Table 10.

Transit Trips

Transit trips were assumed to increase proportionate to the increase in total Hawaii Kai trips. Peak direction transit trips to and from Hawaii Kai during the morning peak traffic hour would thus be:

	EWA DIRECTION PASSENGERS		
	Existing	Increase	Total
Local routes	380	110	490
Express routes	570	160	730
TOTAL	950	270	1,220

Public transit services are assumed to provide increased service commensurate with these increases in patronage.

OTHER KALANIANAOLE HIGHWAY TRAFFIC INCREASES

In addition to the increased Hawaii Kai development, other potential sources of increased travel on Kalanianaole Highway are increased tourist/recreational travel and the travel from continued development of Hawaii Loa Ridge and Waialae Iki.

Table 10

DISTRIBUTION OF ADDITIONAL HAWAII KAI TRIPS[a]

YEAR 1994

FROM	TO: Hawaii Kai Residential Areas[b]	New Marina Business Center Commercial	Kalanianaole Highway Ewa	Kalanianaole Highway Windward
DURING MORNING PEAK HOUR:				
Hawaii Kai Residential Areas[b]	250	120	890	20
New Marina Business Center Commercial	50	10	20	0
Kalanianaole Highway Ewa	180	150	--	--
Kalanianaole Highway Windward	10	10	--	--
DURING EVENING PEAK HOUR:				
Hawaii Kai Residential Areas[b]	480	390	340	20
New Marina Center Commercial	450	20	210	20
Kalanianaole Highway Ewa	710	100	--	--
Kalanianaole Highway Windward	20	10	--	--

(a) Increased vehicle trips estimated for both zoned and Marina Zoning tracts.

(b) Existing, new and planned residential tracts combined, plus existing commercial uses and schools.

Tourist/Recreation Trips

Increased tourist/recreational trips were developed from the findings of the recent islandwide study and forecasts of tourist travel.[2] Twenty (20) Koko Head direction tourist/recreation vehicle trips were added on Kalanianaole Highway in the morning peak hour. In the evening peak hour, Kalanianaole Highway traffic was increased by 100 and 30 vehicle trips in the Ewa and Koko Head directions, respectively, which amounts to a 50 percent increase above existing tourist travel.

Other East Honolulu Developments

The Hawaii Loa Ridge and Waialae Iki single-family residential developments are the only identified developments outside of Hawaii Kai which are expected to contribute traffic to Kalanianaole Highway. Based upon a continuation of the present construction/sales rate of 12 residences per year for each, these two developments would add 108 residences each by 1994.

Based on the single-family trip generation rate and an 85/15 percent split in traffic between points Ewa and Koko Head of the developments, the resultant traffic increase in 1994 is estimated as follows:

	MORNING PEAK HOUR		EVENING PEAK HOUR	
PROJECT/DIRECTION	To Project	From Project	To Project	From Project
Hawaii Loa Ridge:				
From/To Ewa	15	40	50	30
From/To Koko Head	5	20	15	10
	20	60	65	40
Waialae Iki:				
To/from Ewa	15	50	55	35
To/from Koko Head	5	10	10	5
	20	60	65	40

(2) PRC Voorhees, Tourist Travel Study, prepared for Oahu Metropolitan Planning Organization, 1984.

FUTURE TRAFFIC CONDITIONS WITHOUT MITIGATION MEASURES.

Traffic volumes projected for the Hawaii Kai infill and Marina Zoning developments, for the other identified East Honolulu developments, and increased recreational activity, were added to existing traffic volumes to provide an estimate of 1994 peak hour traffic volumes and travel conditions. During the morning peak hour, the increased activities would add as many as 790 vehicles to the inbound (Ewa) direction traffic volumes on Kalanianaole Highway, and up to 310 vehicles to the Koko Head direction volumes. The evening peak hour increases on Kalanianaole Highway would total 460 and 270 vehicles in the Koko Head and Ewa directions, respectively. Approximately 50 percent of these estimated increases would be generated by the Marina Zoning parcels.

The projected increases in through traffic during the morning peak hour would exceed the capacity of the Kalanianaole Highway intersections at Kalaniiki, Laukahi, West Hind, and East Halemaumau Streets. As indicated in the Table 11 volume-capacity analysis summary, the projected volumes would exceed the present capacities of these four intersections by 4 to 15 percent. Without mitigation actions, these increased traffic demands would result in increased travel delays and congestion. Since the existing roadway capacity cannot accommodate the projected peak hour volume, approximately 600 to 650 motorists would have to travel either prior to or after the peak hour, either voluntarily by choice or involuntarily through increased delays.

During the evening peak hour, the projected increases in through traffic would exceed the Kalanianaole Highway intersection capacities at Kalaniiki, Laukahi, East Halemaumau, and Kuliouou Road. The evening increase would exceed the intersection capacities by 200 to 250 vehicles.

Traffic in the Hawaii Kai development areas would increase by an average of 35 to 40 percent above present peak hour volume as a result of the infill development and Marina Zoning projects. Traffic volumes would exceed intersection capacity at the Wailua Street intersections with Lunalilo Home Road and Hawaii Kai Drive during the morning peak hour. During evening peak hour, the projected increase in the left-turn movement from Kalanianaole Highway to Keahole Street would exceed the intersection capacity.

Table 11

VOLUME-CAPACITY ANALYSIS OF KEY INTERSECTIONS
1994 MARINA ZONING WITHOUT MITIGATION MEASURES

INTERSECTION	MORNING PEAK HOUR 1984 V/C	MORNING PEAK HOUR 1984 L.O.S.	MORNING PEAK HOUR 1994 V/C	MORNING PEAK HOUR 1994 L.O.S.	EVENING PEAK HOUR 1984 V/C	EVENING PEAK HOUR 1984 L.O.S.	EVENING PEAK HOUR 1994 V/C	EVENING PEAK HOUR 1994 L.O.S.
Kalanianaole/Ainakoa	-	-	-	-	.93	E	1.03	F
Kalanianaole/Kalanilikt	.99	E	1.15	F	.93	E	1.05	F
Kalanianaole/Laukahi	.95	E	1.13	F	.85	D	.93	E
Kalanianaole/W. Hind	.88	D	1.04	E	.86	D	.95	E
Kalanianaole/E. Halemaumau	.87	D	1.04	E	.93	E	1.03	F
Kalanianaole/Kuliouou	-	-	-	-	.90	E	1.03	F
Kalanianaole/Hawaii Kai Dr.	.78	C	.94	E	.64	B	.83	D
Kalanianaole/Keahole	.76	C	.88	D	.83	D	1.14	F
Kalanianaole/Lunalilio Home Rd.	.57	A	.69	B	.74	C	.86	D
Hawaii Kai Dr./Keahole	.51	A	.81	D	.57	A	.73	C
Hawaii Kai Dr./Wailua	.90	E	1.22	F	.67	B	.99	E
Lunalilio Home Rd./Wailua	.83	D	1.01	F	.56	A	.81	D
Lunalilio Home Rd./Hawaii Kai Dr.	.74	C	.87	D	.48	A	.67	B

V/C - Volume to Capacity Ratio
L.O.S. - Level of Service. See page 26 for description.

Chapter 4

PROPOSED RIDESHARING PROGRAM

Together with the additional development in Hawaii Kai, it is proposed that a broad, aggressive program of ridesharing measures be implemented to accommodate a portion of the travel growth on Kalanianaole Highway. The principal proposed measures are intended to encourage greater use of ridesharing travel modes and reduced dependency on the single-occupant automobile. The proposed measures have been selected based on their compatibility with the following objectives:

1. To encourage new residents to adopt ridesharing since their travel patterns will not have been established as yet.
2. To provide increased opportunities and more attractive services to encourage current residents to shift to a ridesharing mode.
3. To provide programs which may be largely self-sufficient and self-perpetuating to enhance the potential for program continuity and to minimize the need for future public funding support.
4. To minimize future increases of traffic On Kalanianaole Highway during the peak traffic periods.
5. To provide programs compatible with the planned construction of the median reversible High Occupancy Vehicle (HOV) lanes on Kalanianaole Highway by the State DOT.

Although the ridesharing measures have been primarily identified to serve the Hawaii Kai area, many would also be applicable for implementation in other areas and neighborhoods in the East Honolulu corridor. Residents of the full length of the corridor would benefit from these measures, even though restricted to Hawaii Kai, since these efforts would reduce traffic increases which might otherwise be expected to occur.

A preliminary assessment has been made of the usage, costs and traffic impacts for these ridesharing measures. The analysis is based on the assumption that the new Hawaii Kai residents would otherwise take on the travel characteristics (mode and time of travel) of existing residents, and that public transit services would increase apace with population growth and demands.

The initial section of this chapter discusses the assumptions regarding the public transit services, while the following sections describe the measures and summarize the anticipated effectiveness and costs.

POTENTIAL PUBLIC TRANSIT MODIFICATIONS

At present, morning peak hour transit service from Hawaii Kai consist of 7 local bus trips (Line 1 and 57) and 12 express trips (Lines 80, 80A and 82). Provision of additional public transit service commensurate with the increase in Hawaii Kai population and travel would increase morning peak hour service from the present 19 trips to 28 trips. This level of service expansion is comparable to the systemwide level of expansion currently planned by City DTS within this time frame (expansion to 600-bus fleet).

The additional public transit service to/from Hawaii Kai should be assigned to express/local routes to reflect the needs identified through analysis of actual bus use and through marketing studies.

The implementation of a park-and-ride facility (page 50) and the increased residential and commercial developments would likely encourage modifications to present bus routes. Potential modifications include:

- Reroute Line 82 Kalama Valley express buses through the park-and-ride facility on Keahole Street, rather than down Lunalilo Home Road as at present. This would provide access to other express routes and to the Marina Business Center.

- The Line 80 trips which serve the upper Lunalilo Home Road area should be rerouted through the park-and-ride facility and in/out of Hawaii Kai on Keahole Street rather than through the length of West

Hawaii Kai Drive/Kawaihae Street as it is at present. This would reduce the number of local stops made within Hawaii Kai and reduce trip time by about five minutes. The portion of Hawaii Kai Ewa of Keahole Street should be served by a separate express line.

- Two or more of the additional express bus trips should originate in the Kaluanui area along Hawaii Kai Drive to serve this proposed major residential area.

- Two or more of the additional express bus trips should originate at the park-and-ride site to ensure that capacity (and seats) are available to riders boarding at the facility.

- With the expansion of the Marina Business Center, local bus service should be routed along Keahole Street to provide Hawaii Kai and other East Honolulu residents access to this employment and commercial center, as well as to the park-and-ride/transit center.

DESCRIPTION OF RIDESHARE PROGRAM MEASURES

The proposed rideshare program incorporates a broad range of measures to appeal to the various preferences and/or objections expressed to current services; such as ride comfort, access to bus, seat availability, directness and speed of service. The measures incorporated in this program have been successfully implemented in many areas. The estimated effectiveness and costs for these measures have been based an analysis of similar operations in these other areas, and adjusted for Honolulu conditions.

Free Bus Passes to All New Residents

To encourage new Hawaii Kai residents to try public transit, free express bus passes would be provided for a period of one year following their move-in. The bus passes would be available to occupants of all newly-constructed units in Hawaii Kai.

It is proposed that a special public transit monthly pass be employed that would be valid only for use on express buses. This restriction would limit use of the passes to commuters and students who tend to travel during the peak traffic periods, thus concentrating the impact on automobile travel to those trips made on Kalanianaole Highway during the periods when highway congestion occurs. Issuance of a special express bus pass would require special agreement with the City and County of Honolulu.

Implementation of free fares or substantial fare reductions in other cities (Denver, Colorado; Salem, Oregon; Amherst, Maine; Auburn, New York) have found increases in patronage of 40 percent or more above the previous ridership levels. Accordingly, peak hour express bus ridership rates for residents of new residential projects were increased by 40 percent for the first year after occupancy of the unit. One-third of these riders were estimated to continue using transit after the one-year free bus pass ends while the remainder would shift to other modes. Estimates of vehicle travel reduction were based on two-thirds of the additional riders attracted from those who otherwise would drive, and one-third from automobile passengers.

Park-and-Ride Facility

Hawaii Kai was proposed as a transit station/park-and-ride site for any planned East Honolulu rail transit line and, more recently, as a park-and-ride site for express bus services.(1) The proposed site should be located on Keahole Street. The potential for a park-and-ride facility is indicated by the approximately 20 automobiles which are parked daily on Hawaii Kai Drive adjacent to the express bus stop near Wailua Street, and scattered numbers at other express bus stop locations.

The proposed park-and-ride facility is recommended to be developed in two phases. Facility description and operation includes:

(1) Wilbur Smith & Associates, Development of Methodology, Functional Standards, and Design Guidelines for Park-and-Ride Sites, Honolulu, prepared for City and County of Honolulu Department of Transportation Services, 1980.

- Initial phase would provide 140 parking spaces and a terminal facility. The terminal would provide weather protection, seating, telephones, and vending machines.
- A second phase would add 70 parking spaces.
- Short-term parking would be provided for passenger pick-ups and drop-offs.
- Parking would be free and would be available for use by public and private transit riders, and by vanpool and carpool passengers.
- Bus and automobile ingress-egress would be located on Keahole Street.

Usage levels have been based on the 1980 park-and-ride study patronage projections(2) and adjusted to reflect the increased population of Hawaii Kai, plus spaces needed for vanpool and carpool parkers. The estimated reduction in vehicle trips was based on 80 percent of the additional riders being attracted from persons who would otherwise drive to work or school. The larger proportional attraction of automobile drivers reflects the implied availability of an automobile for the trip by persons who would drive to a park-and-ride facility.

Vanpool Program

A vanpool provides direct door-to-door service in 8 to 15-passenger vans for commuters between their neighborhood area and their place(s) of work. The vanpool can generally provide service to a major employer or to several employers within an employment center in a shorter trip time as compared to bus service, and can provide service to employment sites too small to warrant

(2) Ibid.

direct bus service. Formation of a vanpool usually requires that 8 or more interested persons have similar work hours and employment locations. Vanpools generally fall within three categories: 1) employer-sponsored; 2) third-party sponsored, such as a non-profit organization or transit district; and 3) owner-operator "for profit" vanpools. In each, the vanpool operator (driver) usually receives free use of the vehicle, while the passengers are required to pay a monthly "fare" that covers part or all of the vanpool costs.

Vanpool programs have been one of the most successful forms of ridesharing throughout the United States. In 1981, 600 employer and third-party sponsors operated over 12,000 vanpools carrying 125,000 commuters each day. Vanpools have been increasing annually in popularity, with the number doubling every five years. Corridor travel factors which contribute to the success of vanpools are: 1) one-way trip which exceeds 12 to 15 miles; 2) corridor congestion and/or expensive and limited parking at the destination; 3) indirect or inadequate transit service; and 4) sufficient employer or employment center size to have 10 to 12 persons from the same area with similar, fixed work schedules.

For Hawaii Kai, the vanpools would be used either to serve a major employer, or to serve an employment center which does not have direct bus service from Hawaii Kai, such as the International Airport, Iwilei, Pearl Harbor/Hickam Air Force Base, Fort Shafter, and Kakaako areas. The program would be promoted through the active recruitment of vanpool operators and a partial subsidy of vanpool startup costs. Program framework would be as follows:

- Vanpool operators (drivers) would be actively recruited with emphasis on congenial, entrepreneurial individuals.
- Initial van purchases would be provided at a subsidized cost to the operator.
- Start-up operating costs would be subsidized for the first several months while riders are recruited.
- Rider fees would be levied to cover operating costs, plus the purchase of a replacement vehicle.
- Driver would be allowed free personal use of the vehicle.

- Driver is responsible for rider recruitment, fare collection, locations of substitute driver during vacation or illness, and maintaining rider usage and financial records.
- The Hawaii Kai Transportation Coordinator (page 57) would seek employers who would sponsor a vanpool(s) through full or partial payment of vanpool costs.
- Drivers would operate vehicle under a terms of agreement with the program sponsor.

Costs/Fees - Purchase cost for the vans may be up to $17,000 each, with an expected four-year life. Operating costs will approximate $180 to $250 per month, exclusive of depreciation. Based on these costs, rider fees of $30 to $40 per month would be required to cover operating and vehicle replacement costs, dependent upon the vanpool size (8 to 12 riders).

Vanpool Usage - Vanpool programs sponsored by employers have been extremely successful in attracting usage by their employees. The more successful programs--such as the Tennessee Valley Authority (Knoxville), Newport News Shipyard, Ralph Parsons (Pasadena)--generally attract use by 10 to 15 percent of their employees. Almost all programs attract at least 1 to 2 percent.

Third-party vanpool programs are generally directed to serving commuter travel to many locations within a metropolitan area. Programs include those operated by Golden Gate Bridge District (137 vans); Rides for Bay Area Commuters (70 vanpools, San Francisco), Commuter Computer in Los Angeles (137 vans). Limited information is available concerning market penetration. For the Golden Gate program, the vanpools capture one-half percent of all daily work trips made from Marin and Napa Counties into San Francisco.

A major advantage of the Hawaii Kai vanpool program is that it would already be geographically limited at one end--the residential end. The program is further targeted at those who travel during a narrow time period, the peak one-hour traffic period, thus further concentrating the potential market for participants. Nevertheless, it is appropriate to assume the travel characteristics and commuter participants' rate would approximate those for relatively low volume employer-operated systems.

Given the home-end concentration, it is conservatively estimated that vanpools could be used by 1.5 percent of the Hawaii Kai commuter trips which use Kalanianaole Highway during the peak traffic hour. This would be equivalent to use by one-half percent of all Hawaii Kai work trips. The estimated reduction in peak hour automobile trips is based on one-half of the vanpool riders being attracted from automobile drivers and one-half from either carpool or bus passengers.

Hawaii Kai Express Bus Club (Buspools)

A premium express bus service would be organized and operated by an Hawaii Kai Express Club. The Express Club would be managed and promoted by resident-officers of the club, with club sections organized for different areas of Hawaii Kai. The Express Club would provide express buspool service to commuter/members on a daily basis, with payment through a monthly club fee.

This premium express service would be neighborhood-based on the Hawaii Kai end and would make a limited number of stops at the destination (employment center) end. Riders would belong to an individual buspool, thus riding the same bus each day and, if desired, with an assigned seat. General operation would be as follows:

- Bus service would be provided by private contractors selected on a bid basis and in conformance with specifications for vehicles and operating requirements.
- Buses would be air-conditioned, with high-back seats and other comfort items, and would be inspected on frequent basis by club officers.
- Schedules, neighborhood stop points, and destination stops would be determined by club officers based on the requirements of members in each club unit.
- Club officers would market the buspool services, review applications and approve prospective riders, collect monthly rider fees (fares), and establish operating policies relative to smoking, drinking, music, etc.
- Designated club captains on each bus would be responsible for handling daily problems.

- The private bus operator would be fined for failure to maintain bus properly (air conditioning not working) or failure to adhere to the morning/evening pick-up schedule.
- The number of buspools would be expanded as the demand increases and requires additional capacity.
- The private operator would be permitted to use buses for other purposes during non-commute hours.

Costs/Fees - Private bus operator costs would approximate $35 per hour for Honolulu. Based on a five-hour daily requirement, monthly costs would be $3,800. A monthly fee of $40, with a paid ridership for 38 club members, would require $25,000 per year operations subsidy. Actual cost, revenues and subsidy requirements would vary for each bus depending upon the number of riders, length of trip, garage location, other uses for the bus, and degree of competition among private operators for this service.

Express Club Usage - Buspools have been operated in a number of other communities, both for service to a major employment center and for service to a single major employer. Examples of such privately-operated systems include:

System	Destination	Buses	Fare
Club Bus of Marin	San Francisco	27	Monthly
Reston, Va., Commuter Bus	Washington, D.C.	38	Daily
COM-BUS, Los Angeles	South Bay Area Aerospace Companies	47	Weekly
Columbia, Md.	Washington, D.C.		Monthly
St. Louis, Mo.	McDonnell-Douglas	24	--

Statistics available for these systems indicate use by between 2 percent and 25 percent of all employees in the areas served.

Express bus clubs (buspools) are most successful for travel between locations not presently served by express buses and with indirect local bus service. The destination should include sufficient employment by Hawaii Kai residents to provide 35 to 45 potential riders with similar work hours. The primary destinations would be the Waikiki, Ala Moana-Kapiolani Boulevard and

Kakaako areas which, combined, equal the express bus potential for Downtown Honolulu. Other potential employment centers for service would be the Downtown and the Airport/Hickam/Pearl Harbor areas.

As with the vanpool program, use of buspools would be targeted for commuters travelling during the peak traffic hour to the above markets. The estimated market peak hour potential would amount to four to five buspools for the Waikiki-Ala Moana-Kapiolani Boulevard-Kakaako area and one to the Airport-Pearl Harbor area. In addition, the advantages of the premium, subscription buspool service could attract sufficient use to Downtown Honolulu to warrant service.

For this analysis, a club bus program with five buspools is proposed for Hawaii Kai. These could serve five percent of the peak hour commuters to these areas, which is approximately one-half of the current market share of express bus services for Hawaii Kai commuter trips to Downtown.

Aina Haina/Niu/Kuliouou Express Bus Service

Express bus service to these communities is presently limited to a single bus trip between Aina Haina and Downtown Honolulu. The potential market for improved express bus service should be similar to or greater than the express bus ridership in the Hawaii Kai area. Using the Hawaii Kai ridership rate, expanded express bus services could potentially attract an additional 300 passengers in the morning peak hour.

The proposed express bus service would add three additional express bus trips during morning and evening peak periods to serve this area with all three trips occurring during the morning peak hour and two trips in the evening peak hour. Each bus would be routed to initiate service in Kuliouou Valley and then make a limited number of stops in either Niu Valley or Aina Haina, then proceed nonstop to the destination (central business district or Waikiki-Ala Moana area).

Based upon service by a private bus operator, the annual cost would amount to $44,000 per bus for each of the three buses, and an annual subsidy

of $35,000 per bus. This reflects a $35 per hour cost for 5 hours per day, and an average revenue of $15 per month for riders.

Ridership each way should average 40 or more passengers per bus, for a total of 120 or more passengers. One-half or more of these riders should be attracted from automobile drivers, with the balance attracted from local bus or automobile passengers.

Bicycle Facilities

Bicycle storage lockers would be provided at the park-and-ride facility and at selected bus stops to encourage use of bicycles to access the transit terminal and bus services. These facilities would generally consist of storage lockers placed in public, highly-visible locations, such as the Koko Marina and Hahaione Shopping Centers, and Hawaii Kai Post Office. Locations and number of lockers would reflect resident request and usage.

Access to individual lockers would be assigned to commuters or students who are regular bus riders (pass holders) and who would use their bicycle for access to the bus.

Hawaii Kai Transportation Manager

Initial implementation of the ridesharing programs for Hawaii Kai would be expedited and effectiveness improved by the employment of a Transportation Manager. The attention that such an individual can give to the recruitment of vanpool drivers and initial buspool riders, the marketing of transit services, and the solicitation of assistance from the employers of Hawaii Kai residents, would generally result in a more rapid increase in ridesharing to a higher eventual level of use than would be realized without such a person. Use of a Transportation Manager in other communities has generally produced a 5 percent increase in rideshare program participation, independent of any other changes in the rideshare measures. The role of the transportation manager would include:

1. Assist in start-up of buspools, such as preparation of bid specifications, negotiate service contracts, and assist in formation of initial selection of officers for the Express Club.

2. Recruit drivers, arrange vehicle acquisitions, and develop service guidelines for vanpools.

3. Update and disseminate buspool, vanpool and other ridesharing information on a regular basis to Hawaii Kai residents and business employees.

4. Prepare and distribute brochure to local realtors and leasing agents for their distribution to perspective home purchasers or renters. Brochure would describe public bus services and the rideshare program, and include a travel information form. This form would be filled out to identify commute information needed to assist and identify rideshare potentials for each new resident.

5. Visit new residents to acquaint them with the rideshare program and to solicit information for use in rideshare matching.

6. Conduct rideshare matching program for commuters interested in carpooling or participating in vanpool or buspool.

7. Assist parents in pooling travel of students to public and private schools and day care centers.

8. Coordinate a transit use incentive program, which would award prizes to participants in the programs.

9. Coordinate with City relative to modifications in public transit services and schedules.

10. Coordinate with employers of Hawaii Kai ridesharers to seek preferential parking for vanpools and carpools to solicit funding support for the rideshare effort, and to seek work hour adjustments/flexibility to enable an employee to participate in the rideshare program.

11. Monitor effectiveness of the programs and program costs.

The primary need for such a transportation manager would be in the first several years of program start-up. All of the programs are designed to be self-perpetuating.

The transportation manager's active promotion of ridesharing within the community figures should result in a 5% increase and participation in the Hawaii Kai rideshare program, and an estimated 3% increase in the present level of carpooling.

RIDESHARE PROGRAM EFFECTIVENESS

The rideshare program would reduce automobile travel in the peak traffic direction on Kalanianaole Highway by an estimated 360 and 280 vehicle trips during the morning and evening peak traffic hours, respectively. These reductions reflect full implementation of the proposed rideshare measures, and the full occupancy of the additional Hawaii Kai development described in Chapter 3. The contributions of the individual measures to the peak hour reduction in vehicle travel are listed in Table 12.

Table 12

RIDESHARE PROGRAM EFFECTIVENESS[a]

Kalanianaole Highway Peak Hour, Peak Direction Travel

MEASURES	NUMBER	RIDERS		AUTO REDUCTION	
		Morning	Evening	Morning	Evening
Free Bus Pass Passes	-	60	40	30	30
Park-and-Ride Parking Spaces	210	70	55	55	45
Vanpools	11	110	85	65	50
Express Club Buses	5	200	160	110	85
Aina Haina/Niu Kuliouou Express Buses	3	120	80	60	40
Bicycle Facilities	-	10	10	5	5
Marketing/Rideshare Coordination	-	50	40	35	25
TOTAL		620	470	360	280

(a) Estimated impacts at full implementation in 1994.

The rideshare program vehicle travel reductions would offset a portion of the "trend" travel increases projected for the new Hawaii Kai developments, as discussed in Chapter 3. Implementation of the measures would reduce estimated increases in peak direction travel as follows:

	Morning Peak Hour	Evening Peak Hour
Increased Travel Due to New Hawaii Kai Development	790	380
Rideshare Reduction in Vehicle Trips	-360	-280
Net Increase in Peak Direction Hawaii Kai Trips	430	100

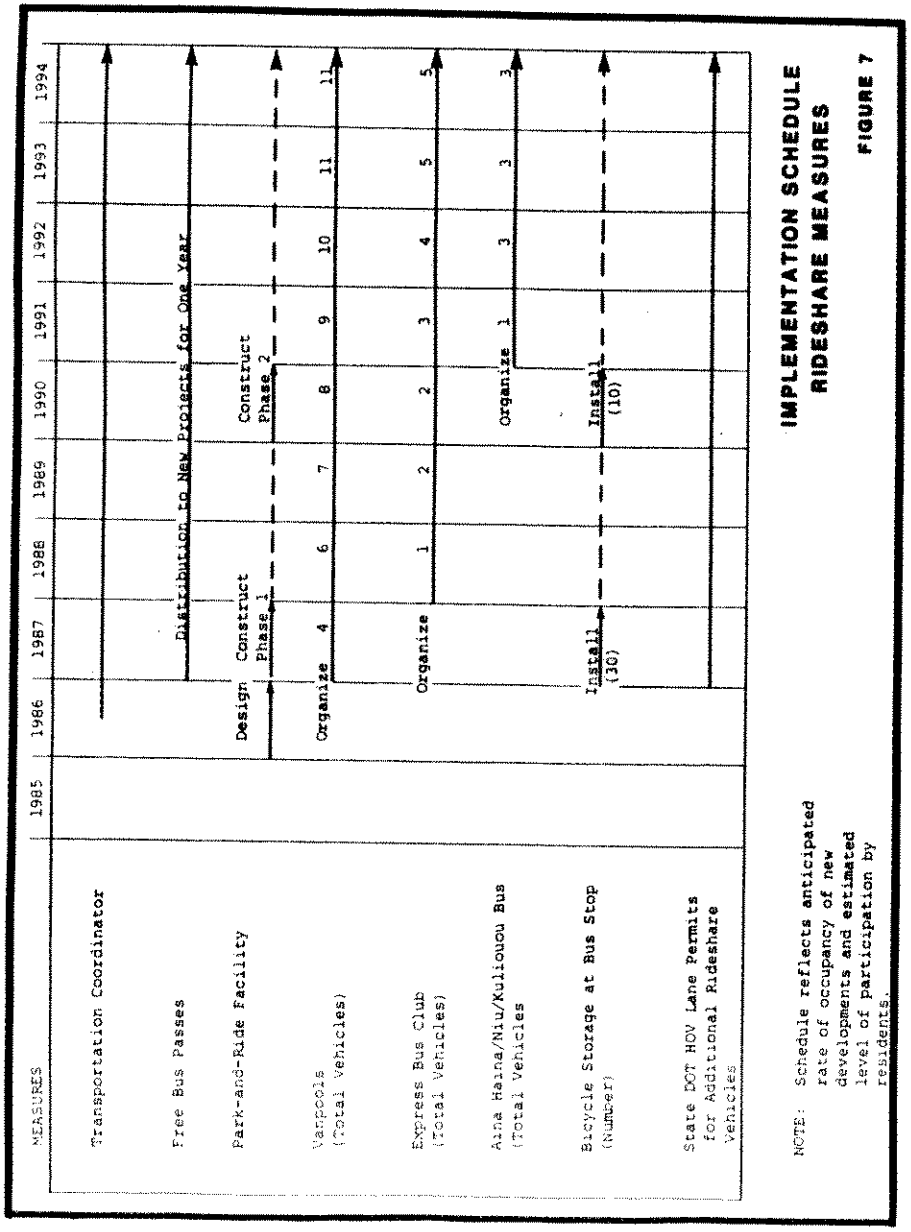
The estimated travel reductions by year for each proposed measure are presented in Appendix A.

IMPLEMENTATION PROGRAM

Implementation Schedule

Implementation of the rideshare program would be timed to parallel the traffic increases which would result from anticipated development phasing of the new Hawaii Kai residential tracts. The schedule would also be influenced by residential acceptance and use of each program measure. Greater or lesser use of an individual measure may result in accelerated or slowed implementation of that measure.

The anticipated implementation schedule is outlined for each measure in Figure 7. Key factors affecting the schedule are:



IMPLEMENTATION SCHEDULE
RIDESHARE MEASURES

FIGURE 7

- Initial preparation of plans for implementation would begin in 1986. Actual procurement of services would be initiated following final approval of the zoning request, which is expected in mid-1986.

- The Transportation Manager is needed at the beginning of the program to organize and initiate many of the other programs. The position could be phased out or level of effort reduced in the later program years when most measures have been implemented and most developments occupied.

- One-year free bus passes would be continually implemented as additional tracts are developed during the 1986-94 period.

- The vanpool and club bus elements would be initiated during the early years of the program and expanded as warranted by commuter use.

Program Costs

The estimated capital costs needed to implement the program measures are summarized by year in Table 13. Estimated program costs total $967,000 as expressed in 1984 dollars. These capital cost items include:

- Design and construction of 210-space park-and-ride facility. No land costs are included.
- Purchase and placement of 40 bicycle storage lockers.
- Acquisition of 11 vans.
- Acquisition of a microcomputer, ridesharing and related software, and related office items for use by the Transportation Coordinator.

Operating costs, identified in Table 14, reflect the net cost or subsidy requirement after subtraction of fare revenues from passengers of the vanpool and express bus services. Estimated operating costs for the program, expressed in 1984 dollars, would total $1.5 million over the 1986-94 period.

Table 13

RIDESHARE PROGRAM CAPITAL COSTS[a]

YEAR	PARK-AND RIDE FACILITY[b]	BICYCLE LOCKERS	VANPOOL PURCHASES	RIDESHARE COMPUTER	TOTAL
1985					
1986	$ 70,000			$10,000	$ 80,000
1987	500,000		$68,000		568,000
1988		$ 15,000	34,000		49,000
1989			17,000		17,000
1990	180,000	5,000	17,000		202,000
1991			17,000		17,000
1992			17,000		17,000
1993			17,000		17,000
1994					
TOTAL	$750,000	$20,000	$187,000	$10,000	$967,000

(a) In 1984 dollars.
(b) Does not include land costs.

Table 14

RIDESHARE PROGRAM OPERATING COSTS/SUBSIDY[a]

(In Thousands of 1984 Dollars)

YEAR	BUS PASSES	PARK-AND RIDE	VAN POOLS	EXPRESS CLUB[b]	KULIOUOU EXPRESS[c]	TRANSPORT. MANAGER	TOTAL
1985						0	
1986	$ 7					$20	$27
1987	13		$ 4			40	57
1988	17	$25	2	$25		40	109
1989	17	25	1	50		40	133
1990	13	25	1	50		40	129
1991	13	30	1	75	$ 35	40	194
1992	9	30	1	100	105	40	285
1993	13	30	1	125	105	40	314
1994	13	30		125	105	40	313
TOTAL	$115	$195	$11	$550	$350	$340	$1,561

(a) Costs/subsidy after rider pays fares/fees.
(b) Subsidy $25,000 per year per bus.
(c) Subsidy $35,000 per year per bus.

Chapter 5

ROADWAY IMPACTS AND MITIGATION MEASURES

The implementation of the proposed ridesharing measures would offset a significant portion of the traffic increase which would otherwise be generated by the new Hawaii Kai developments. The resultant increase in Hawaii Kai traffic, combined with additional traffic from other new developments and recreation activities, would increase Kalanianaole Highway volumes by 4 to 15 percent at different locations during the peak traffic hours.

As discussed in Chapter 2, the Ewa portion of Kalanianaole Highway is presently operating at capacity during the morning peak hour, and morning or evening traffic volumes at several other locations within Hawaii Kai and on Kalanianaole Highway are approaching the capacity of key intersections. Localized roadway and traffic operational measures have been identified for those locations which would be significantly affected by the future traffic increases.

PROJECTED 1994 PEAK HOUR TRAFFIC WITH RIDESHARE PROGRAM

The magnitude and composition of the estimated increases during the morning and evening peak hours are summarized in Table 15 for two locations on Kalanianaole Highway: Kalaniiki and Kawaihae Streets at the Ewa and Hawaii Kai ends of the corridor, respectively. The Hawaii Kai traffic increase represents the combined traffic from the infill completion of zoned tracts now being developed, expansion of the Marina Business Center, and development of 2,400 housing units in the Marina Zoning tracts. The increase "without rideshare" reflects the continuation of the present travel mode usage. The rideshare program impact is offset against this "trend" increase in order to determine a net increase attributable to Hawaii Kai development.

Hawaii Loa Ridge and Waialae Iki development traffic and increased tourist and recreational traffic have been added where appropriate.

The largest increase would occur at Kuliouou Road during the morning peak hour. The increase would amount to 480 and 310 vehicles in the

Table 15

ESTIMATED 1994 TRAFFIC INCREASES
ON KALANIANAOLE HIGHWAY

TRAVEL INCREMENT	AT KALANIIKI ST. Towards Honolulu	AT KALANIIKI ST. Towards Hawaii Kai	EWA OF KAWAIHAE ST. Towards Honolulu	EWA OF KAWAIHAE ST. Towards Hawaii Kai
DURING MORNING PEAK HOUR:				
Existing Volume	4,550	910	3,200	600
Hawaii Kai Increase				
Increase without Rideshare	690	160	790	280
Rideshare Reduction	-360	0	-310	0
Other Development	80	20	0	10
Increase Recreation	0	20	0	20
TOTAL	4,960	1,110	3,680	910
NET INCREASE	+410	+200	+480	+310
DURING EVENING PEAK HOUR:				
Existing Volume	1,660	4,020	1,130	2,270
Hawaii Kai Increase				
Increase Without Rideshare Reduction	60	340	160	380
Rideshare	0	-280	0	-240
Other Development	50	90	10	0
Increase Recreation	100	30	100	30
TOTAL	1,870	4,200	1,400	2,440
NET INCREASE	+210	+180	+270	+170

peak (inbound towards Honolulu) and off-peak directions, respectively. Evening peak hour increases would be lower due to: 1) the longer period and lower hourly volumes characteristic of the evening peak period; and 2) the increased proportion of trips which would remain within Hawaii Kai as a result of the additional shopping and business activities of the Marina Business Center.

The 1994 traffic volumes projected for Kalanianaole Highway, after implementation of the rideshare measures, are presented in Figure 8.

KALANIANAOLE HIGHWAY TRAFFIC CONDITIONS

The analysis of traffic conditions along Kalanianaole Highway reflects the existing roadway facilities and traffic controls, plus the inclusion of planned new traffic signals at Hawaii Loa Ridge Drive and Kawaihae Street. This analysis does not reflect the capacity increases which would result from completion of the State DOT's median HOV lane widening project.

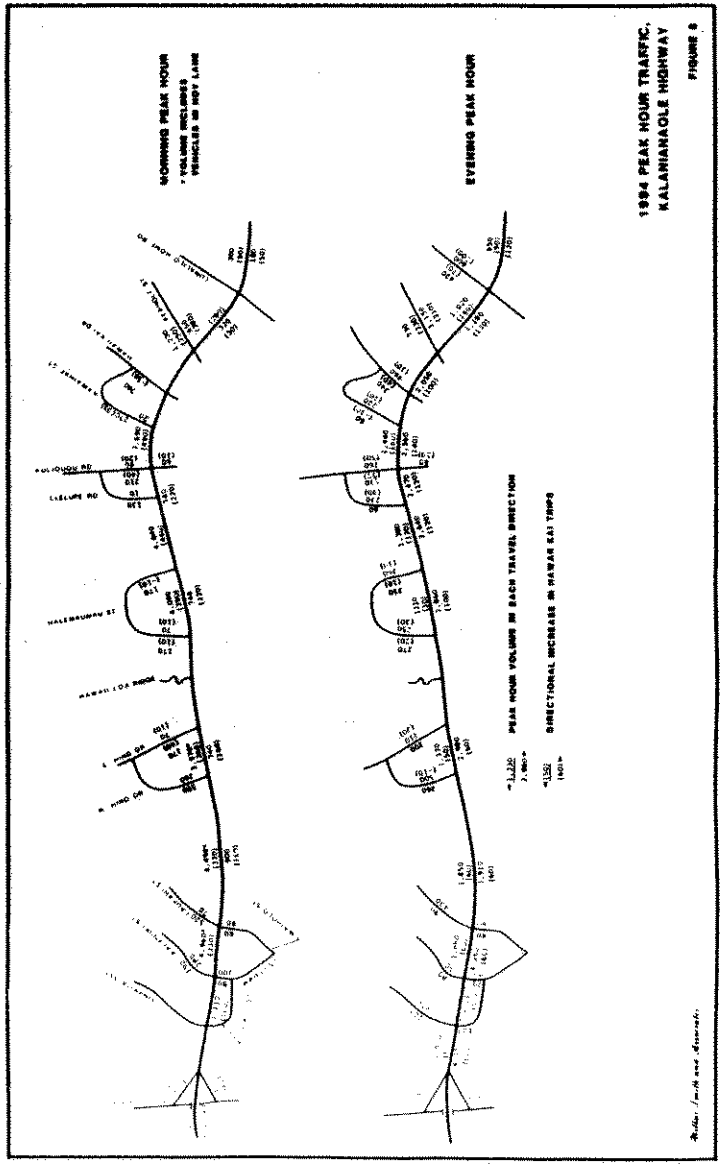
The analysis of morning conditions is based upon a peak hour volume of 320 vehicles using the contraflow High Occupancy Vehicle (HOV) lane, which is the same as 1984 use. As part of the rideshare program, it is proposed that 120 additional peak hour buses, vanpools and carpools be allowed to use the HOV lane.

A summary of the volume-capacity relationship and anticipated service levels for the key intersections are presented in Table 16.

Morning Peak Hour

With the projected traffic increases, the adverse impacts would be centered on the Kalaniiki/Waieli and Laukahi/Waiholo Streets intersections with Kalanianaole Highway.

Kalaniiki-Waieli Streets - Ewa direction traffic is projected to increase by 410 vehicles during the morning peak hour, with Hawaii Kai contributing 330 vehicles. Since the Kalaniiki Street intersection currently operates at



1994 PEAK HOUR TRAFFIC, KALANIANAOLE HIGHWAY

FIGURE 8

capacity on school days, the additional volume could not be accommodated during the peak hour without roadway or traffic operational modifications, or a change in Kalani High School operations.

The most economical measure to improve traffic conditions during the morning peak traffic hour would be to change the start of Kalani High School classes to 9:00 A.M. as opposed to the current 8:00 A.M. This would delay arrival of most faculty and student traffic and the pedestrian crossings of Kalani High School to the 8:30 - 9:00 A.M. period. As shown in Figure 4, traffic volumes are considerably lower during this period. This measure would improve traffic volume-capacity ratio to 1.00 for the morning peak hour.

Alternative physical and traffic operational modifications which could be used to improve operations at the intersection could include construction of a pedestrian overpass, diversion of part or all of the Waiell Street left turn traffic to other intersections (Waikui and Waiholo Streets), or construction of a fourth Ewa direction lane through the Kalanikii intersection to the Kilauea off-ramp.

Laukahi Street - The combined increase of the Kalanianaole Highway traffic and the Waialae Iki traffic on Laukahi Street would approximate the capacity of this intersection. Traffic delays would be expected to increase at this intersection, although traffic flow conditions along this section of Kalanianaole Highway would still be controlled by the Kalanikii intersection.

East Hind Drive to Kawaihae Street - The four-lane section of Kalanianaole Highway would be able to accommodate increased traffic volumes with a continuation of the present reversible lane operation.

Traffic volumes may approach intersection capacity at East Halemaumau Street. A heavy right-turn volume from inbound Kalanianaole Highway occurs at this intersection by traffic destined to Niu Valley Intermediate School and Niu Valley Shopping Center. If necessary, traffic flow could be improved by provision of a separate right-turn lane to accommodate this movement.

Hawaii Kai Intersections - No problems are expected at these intersections. The increased right-turns from the mauka area can be accommodated

Table 16

VOLUME-CAPACITY ANALYSIS OF KEY INTERSECTIONS

INTERSECTION	MORNING PEAK HOUR 1982 V/C	1982 L.O.S.	1994 V/C	1994 L.O.S.	EVENING PEAK HOUR 1982 V/C	1982 L.O.S.	1994 V/C	1994 L.O.S.
Kalanianaole/Alinaka	-	-	-	-	.93	E	.97	E
Kalanianaole/Kalanikii	.99	E	1.08	F	.93	E	.99	E
Kalanianaole/Laukahi	.95	E	1.02	F	.85	D	.88	D
Kalanianaole/W. Hind	.88	D	.94	E	.86	D	.90	E
Kalanianaole/E. Halemaumau	.87	D	.97	E	.93	E	.96	E
Kalanianaole/Kuliouou	-	-	-	-	.90	E	.97	E
Kalanianaole/Keahole	.76	C	.84	D	.83	D	1.11	F
Hawaii Kai Dr./Keahole	-	-	1.25	F	-	-	.84	D
Hawaii Kai Dr./Wailua	-	-	1.15	F	-	-	.95	E
Lunalilo Home Rd./Wailua	.83	D	.96	E	.56	A	.77	C

V/C - Volume to Capacity Ratio
L.O.S. - Level of Service. See page 26 for description.

by the double right-turn lanes for makai-direction traffic on Hawaii Kai Drive and Keahole Street, and the continuous right-turn permitted from Lunalilo Home Road.

Evening Peak Hour

Impacts during the evening peak hour would be less severe than the morning impacts, but would affect longer sections of the corridor.

Ainakoa Avenue to Laukahi Street - Projected volumes along this segment could be accommodated by the existing roadway without a significant deterioration in Kalanianaole Highway travel conditions. The projected traffic volumes would be approaching the capacity of the Ainakoa Avenue intersection and could potentially result in increased delays for traffic entering Koko Head-direction Kalanianaole Highway from the Kilauea Street on-ramp. Intersection operations could be improved by provision of a short merging lane through the Ainakoa intersection for the on-ramp, or by providing two lanes for the through/left turn movement from Ainakoa Avenue.

East Halemaumau Street - The increased volume of Koko Head-direction traffic on Kalanianaole Highway would be offset by a net reduction (40 vehicles) in left-turn traffic from East Halemaumau Street (shopping trips diverted from Niu Valley Shopping Center to expanded Marina Business Center). Traffic conditions could be slightly improved by provision of Koko Head-direction bus pullout and the modification of pedestrian crosswalks.

Kuliouou and Elelupe Roads - The Koko Head-direction through traffic would continue to experience delays along this section as a result of the left turns made from the through traffic lanes and the stopping of transit buses in the through lanes. The increased through traffic could be accommodated within the present capacity of the Kuliouou Road intersection, but would experience a slight increase in travel delays due to the left-turn vehicle and bus blockage of the through lanes.

Conditions at this location could be improved by the provision of an additional through lane, provisions of left-turn lanes at Elelupe and/or Kuliouou Road, or provision of a bus pullout. Prohibition of left-turns at

Elelupe Road, with this traffic routed via the jughandle movement to Kuliouou Road, would also improve operations. However, this approach would require the widening of Kuliouou Road to provide two mauka direction lanes through the intersection.

Keahole Street - The increased number of left-turn vehicles from Kalanianaole Highway to Keahole Street would result in a longer queue of vehicles waiting to turn left, and an increase in traffic delays at this intersection. The operating conditions at the Hawaii Kai Drive and Lunalilo Home Road intersections would not permit a sufficient number of these left- turn vehicles to be routed to these intersections to eliminate the problem at Keahole Street.

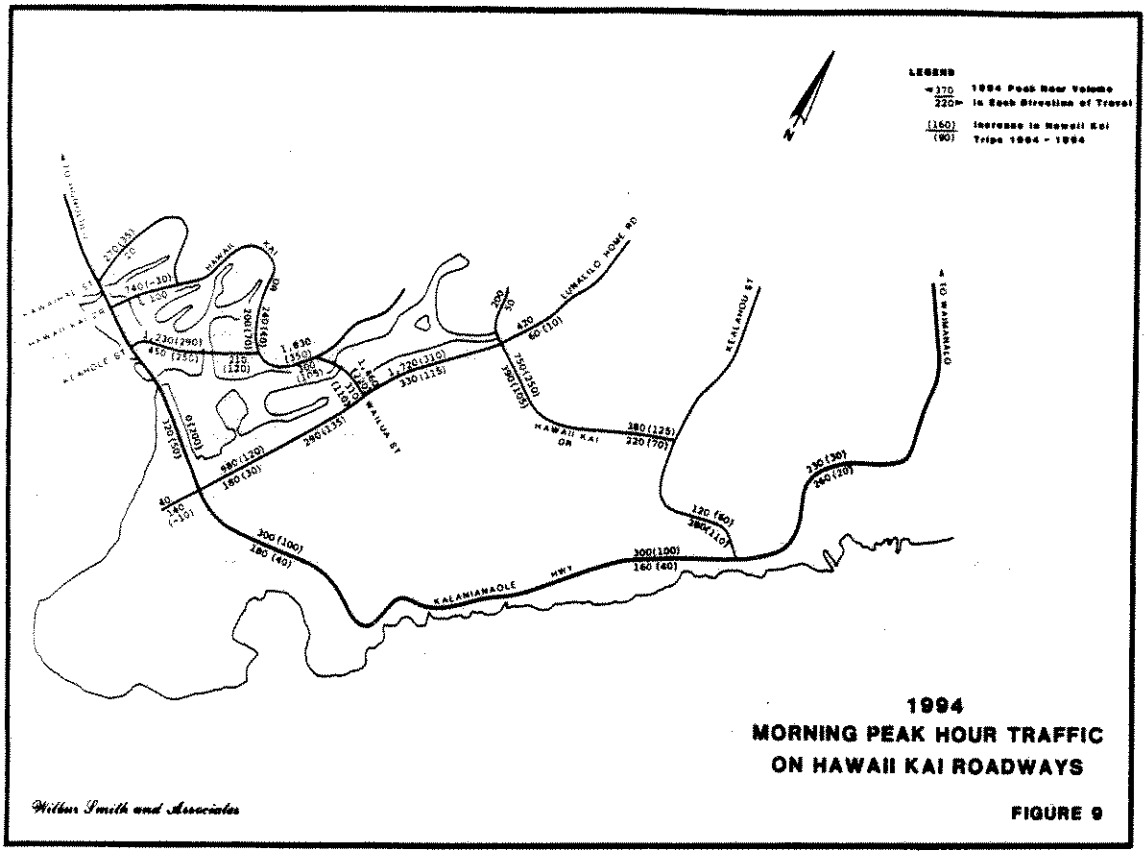
HAWAII KAI ROADWAY CONDITIONS

The principal traffic increases in the Hawaii Kai area would occur along Wailua Street, Hawaii Kai Drive and Keahole Street adjacent to the Marina Zoning parcels. Projected morning and evening peak hour traffic volumes are depicted in Figures 9 and 10, respectively, for the major roadways in the Hawaii Kai area.

As indicated in Table 16, the projected traffic volumes would exceed the capacity of the Hawaii Kai Drive/Wailua Street intersection during the morning peak hour period. The major movement is the Honolulu-bound left-turn traffic, which would still be restricted to use of a single lane after the planned installation of a traffic signal at the intersection. Two left-turn lanes are necessary to accommodate the morning makai-direction movement.

The Hawaii Kai Drive/Keahole Street intersection would provide sufficient capacity to accommodate the proposed traffic if the intersection approaches are realigned to make Keahole Street-mauka Hawaii Kai Drive the through movement. Without realighment, the volume-capacity ratio would increase to 1.25.

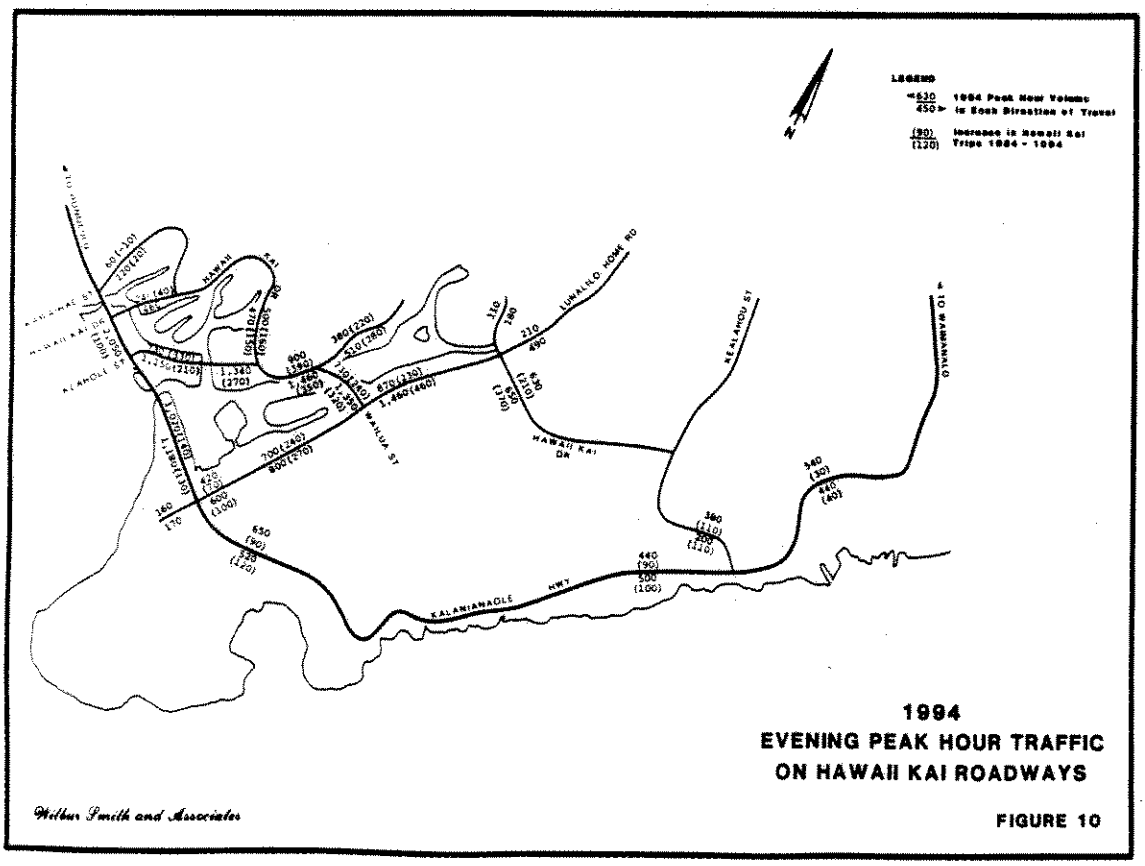
The right-turn from Lunalilo Home Road to Wailua Street would be approaching capacity with the 1994 morning peak hour traffic. The intersection could be improved in the future by widening Wailua Street to accommodate either a continuous right-turn or a double right-turn movement from Lunalilo Home Road.



1994
MORNING PEAK HOUR TRAFFIC
ON HAWAII KAI ROADWAYS

Wilbur Smith and Associates

FIGURE 9



1994
EVENING PEAK HOUR TRAFFIC
ON HAWAII KAI ROADWAYS

Wilbur Smith and Associates

FIGURE 10

PROPOSED MITIGATION MEASURES

Based on the analyses of 1994 traffic conditions, a series of roadway and operational modifications are recommended for those locations where the traffic increases would significantly affect traffic operations. These modifications could be implemented independently of the planned State DOT Kalanianaole Highway HOV lane widening project. Traffic impacts of each modification are summarized in Table 17. In developing a recommended program, measures were selected, where possible, to: 1) minimize any taking of right-of-way for the improvement; and 2) retain its usefulness after construction of the State DOT Kalanianaole Highway HOV widening project.

Kalanianaole Highway

The improvements proposed to mitigate the impact of the additional through traffic at this intersection are as follows:

1. Construct a pedestrian bridge crossing over Kalanianaole Highway midway between Kalaniiki and Laukahi Streets, in the vicinity of Iki Place, and relocate the makai side bus stop from Kalaniiki Street to the overpass. An automobile passenger drop-off area could also be provided at the pedestrian bridge.

   With construction of the overpass, both the Koko Head and Ewa side cross walks should be removed and pedestrian crossing prohibited across Kalanianaole Highway.

2. Permit left turns from Waikui Street during the morning peak period. The morning traffic coning at the Ainakoa/Waikui Street intersection should be changed and the traffic signal controls modified to permit the left turn movement from Waikui Street during the morning peak period. This would permit diversion of a portion of the Waieli Street left turn traffic to Waikui Street, thus reducing the signal time required for the through traffic on Waieli Street and reducing conflicts with the heavy right turn movement from Kalaniiki Street.

3. HOV lane permits should be issued to the additional bus, vanpool and carpool vehicles (Chapter 4). This would shift approximately 120 vehicles from the normal inbound through lane to the HOV lane.

Table 17

TRAFFIC IMPACTS OF PROPOSED MITIGATION MEASURES

LOCATION	PROJECT	PEAK HOUR	VOLUME-CAPACITY RATIOS 1984	VOLUME-CAPACITY RATIOS 1994 Without Project	VOLUME-CAPACITY RATIOS 1994 With Project	EQUIVALENT CAPACITY INCREASE (Vehicles/Hour)
KALANIANAOLE HIGHWAY						
Kalaniiki St.	1. Pedestrian Bridge	AM	.99	1.08	1.02	300
	2. Permit Waikui Left Turn				1.06	75
	3. #1 & #2 Combine				1.00	375
	4. Add 120 HOV's				1.05	120
	5. #1 + #2 + #4				.98	495
Laukahi St.	1. Pedestrian Bridge	AM	.95	1.02	.99	130
	2. Add 120 HOV's				1.00	120
	3. #1 & #2 Combine				.97	250
Keahole St.	Add 2nd Left Lane	PM	.83	1.09	.79	---
HAWAII KAI DRIVE						
Keahole St.	Realign to Improve Traffic Flow	AM	---	.77	.77	---
		PM	---	.69	.69	---
Wailua St.	Restripe	AM	---	1.15	.74	---
		PM	---	.95	.95	---

As shown in Table 17, the cumulative effect of these measures should more than offset the estimated increase in traffic.

Laukahi-Waiholo Streets - The pedestrian overpass and increase HOV lane usage proposed for the Kalaniiki Street intersection would also improve future traffic condition at Laukahi Street. These changes, plus the restriction of pedestrians at grade crossing across Kalanianaole Highway,would largely offset the increase in the inbound through traffic during the morning peak hour.

Four-Lane Kalanianaole Highway Section - Improve bus pullouts are proposed for the makai side bus stops at East Halemaumau Street and Kuliouou Road. This would permit local buses to pullout from the through lane when stopping to board or discharge passengers at these bus stops and thus reduce future lane blockages and the resultant vehicle delays.

Keahole Street - A second left-turn lane should be added on Kalanianaole Highway for traffic turning onto Keahole Street. This lane would require widening on the mauka side of Kalanianaole Highway to provide the additional storage lane and the roadway width transition. Additional right-of-way would be required.

Hawaii Kai Intersections

Hawaii Kai Drive and Keahole Street - This unsignalized intersection is currently approaching its capacity constraints during the morning peak traffic period. Keahole Street has become the major access route to/from the Mariner's Ridge, Mariner's Valley, and Kalama Valley areas, which would result in increase makai direction traffic turning left at this intersection. The Ewa segment of Hawaii Kai Drive accommodates relatively minor traffic volumes, with a major portion also turning makai onto Keahole Street.

The City plans to restripe and add traffic islands to the intersection to allow Keahole Street and the mauka leg of Hawaii Kai Drive to function as the through street. A traffic signal should be installed at this intersection. The intersection could also be realigned to improve traffic flow through the

intersection. The driveway access to the Marina 11A parcel should be aligned as the fourth leg of this intersection opposite the Ewa side Hawaii Kai Drive leg of this intersection. This would permit traffic signal protection for vehicles exiting the development and to avoid a short offset between the Marina 11A driveway and the Hawaii Kai Drive-Keahole Street intersection.

Hawaii Kai Drive and Wailua Street - This intersection experiences a problem similar to the Keahole Street intersection, with Wailua Street and the makai leg of Hawaii Kai Drive serving the major traffic movement. The City plans to install a traffic signal, but the major movement would still be restricted to a single lane.

Improvement at this intersection should include the striping of the 40-foot wide pavement on Wailua Street for two lanes in the makai direction and one lane in the mauka direction. The inside Ewa-direction lane would permit left-turns for makai direction travel, and the outside lane would permit either left or right turns. This two-lane segment should extend easterly to the Wailua Street bridge.

Keahole Street Widening - Two additional intersections will be added on Keahole Street to provide access to the proposed park-and-ride facility and the new Towne Center office and retail development. Both intersections should be constructed as conventional four-way intersections with the Ewa leg of each providing access to the park-and-ride facility, and the Koko Head legs providing access to the new office-retail center. Keahole Street should be widened to provide left-turn storage lanes at each intersection for turns into the park-and-ride facility and into the new Towne Center commercial development.

Traffic signals should be installed at both intersections to facilitate bus ingress-egress to the park-and-ride facility, and motorist egress from the Towne Center commercial development.

Traffic Signal Interconnection - With the two new traffic signals on Keahole Street and the planned traffic signals on Hawaii Kai Drive at Keahole and Wailua Streets, the number of traffic signals on the realigned Keahole

Street-mauka Hawaii Kai Drive will increase from the present one signal (at Kuapa Kai Center) to five. Distance between these five signals will average approximately 1,000 feet apart.

These five traffic signals should be interconnected to permit timing offsets to be coordinated between the traffic signal controls at each intersection. This coordination would enable a progression of green time through the system for the peak-directional traffic movement and, thus, minimize the vehicle stops and delay.

IMPLEMENTATION

The general schedule for development of the recommended roadway modifications is proposed as follows:

Location/Project	Design	Construction	Operational
Kalaniiki Street Overpass	1987	1987-88	Late 1988
Permit Waikui Street Left-Turn in morning	1987	1988	1988
Increase HOV Lane Permits	--	--	1986-94
East Halemaumau and Kuliouou Bus Pullouts	1987	1988	1988
Double Left-Turn Lane from Kalanianaole Highway to Keahole St.	1987	1987	1987
Realign Keahole/Hawaii Kai Drive Intersection	1986-87	1987	1987
Restripe Wailua/Hawaii Kai Drive Intersection	1987	1987	1987
Widen Keahole St. and Install New Signals at Park-and-Ride	1987	1988	1988
Interconnect 5 Keahole Street/Hawaii Kai Signals	1987	1988	1988

Implementation costs would total $2,0250,000 for these projects, as summarized in Table 18.

Table 18

ROADWAY PROJECT COSTS
(In 1984 Dollars)

LOCATION/PROJECT	CAPITAL COSTS Construction	Right-of-Way	Total
KALANIANAOLE/KALANIIKI			
Pedestrian Bridge	$600,000	$400,000	$1,000,000
Prohibit Left Turns	0	0	0
Increase HOV's	0	0	0
TOTAL	$600,000	$400,000	$1,000,000
KALANIANAOLE/WAIKUI			
Allow Left Turns Adjust Signals	$ 10,000	0	$ 10,000
KALANIANAOLE/KEAHOLE			
Add Second Left Turn Lane on Kalanianaole for Turn into Hawaii Kai	140,000	Not Included	140,000
KALANIANAOLE HIGHWAY			
Four Lane Section Improve Bus Pullouts	20,000	0	20,000
HAWAII KAI DR./KEAHOLE ST.			
Realign Streets	350,000	0	350,000
HAWAII KAI DRIVE/WAILUA ST.			
Restripe	$ 20,000	0	$ 20,000
KEAHOLE STREET			
Widen for Left Turns	$240,000	0	$ 240,000
Install Two Signals	120,000	0	120,000
Interconnect Signals	125,000	0	$ 125,000
TOTAL	$485,000	0	$ 485,000
GRAND TOTAL			$2,025,000

XII

REFERENCES

XII. ADDITIONAL REFERENCES

University of Hawaii, Department of Geography; Atlas of Hawaii, Second Edition; 1983

U.S. Army Engineer District, Honolulu; Final Environmental Statement for the Department of the Army Permit Actions in the Hawaii Kai Marina; July 1975

U.S. Army Engineer District, Honolulu; Informational Supplement to the Final Environmental Statement for the Department of the Army Permit Actions in the Hawaii Kai Marina, Oahu, Hawaii; November 1976

United States Department of Agriculture Soil Conservation Service; Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii; August 1972

Department of General Planning, City and County of Honolulu; Proposed Amendment to the East Honolulu Development Plan Fiscal Year 1983-84 Annual Review; December 1983

APPENDIX A

ENVIRONMENTAL ASPECTS
OF
STORM WATER RUNOFF

Hawaii Kai Marina Zoning Project
Oahu, Hawaii

May, 1985

By
Gordon L. Dugan, Ph.D.
Environmental Consultant

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INTRODUCTION

The proposed Hawaii Kai Marina Zoning Project, covering an area of 97.8 acres, is located in the Hawaii Kai area near Koko Head, on the eastern tip of Oahu, as shown in Figure 1. The project as conceived, will require zoning changes from Ag-1 restricted agriculture, preservation, and R-6 residential to low density (A-2) and medium density (A-2) apartments. As presently proposed, the project consists of essentially five areas that are separated by major city streets, as can be noted in Figure 1.

Approximately 80% of the proposed development area is underlain by mixed fill, which was primarily derived from dredging the original Kuapa Pond, an ancient Hawaiian fish pond. The fill material is thus, primarily of alluvium origin which is generally only moderately permeable. The remaining approximately 20% of the development area consists of Koko soil, a fairly permeable material. The project site is presently covered with a varying amount of grasses and brush, principally Californiagrass and Haole Koa. The mean annual rainfall in this area is approximately 35 in. (Dowald, 1981). As can be noted in Figure 1, the proposed development involves a considerable length of marina shoreline. A large area on the eastern portion of the proposed development, across from Kaiser High School, had berms constructed around its periphery so that it could be used as the receptacle area (settling/dewatering basin for part of the dredged material removed from the 1983 dredging of Kuapa Pond.

Associated with urban development projects such as is being herein proposed are alterations in surface water runoff resulting from increasing the area of imperviuos surfaces, through development of roof tops, roadways, parking lots, and the like. Interest in these runoff changes is generally a result of concern over two factors -- one, public safety, and two, environmental impact. The first factor requires the identification of changes in peak discharge rates, the magnitudes of which are necessary for designing adequate drainage structures to prevent flooding, while the second concern requires identification of the changes in total runoff volume, as well as sediment, nutrient, and other constituent loads, and the effects these will have

on the ecosystem of the natural resource serving as the "sink." It is this second concern, environmental impact resulting from increased runoff volume and sediment and nutrient loads, and its probable effect on subsequent receiving waters (Kuapa Pond) that is under study in the present investigation as herein reported.

PURPOSE AND SCOPE

The purpose of this study is to evaluate the environmental impact of the proposed awaii Kai marina Zoning Project as it relates to surface water runoff. From an assemblage of baseline hydrologic and water quality data, an estimate of the existing and projected volume and quality characteristics of surface water runoff will be made, along with an assessment of the environmental impact resulting from this runoff, in the form of written comments.

METHODOLOGY

The methodology used in this study consisted of assembling, analyzing, and interpreting existing data from federal, state, and county agencies, as well as from on-site surveys of field conditions.

Inasmuch as the scope of work consisted of estimating the alterations in volume and quality of surface water runoff resulting from the proposed project, it was necessary to identify those factors that affect runoff generation quality for both pre-and post-development conditions.

Methods currently available to estimate the surface water runoff volume from a specific storm event requires the determination of reasonable rainfall-runoff coefficients for varying magnitude and duration storms, and for different land management, vegetation, soil, and soil moisture conditions, to name but a few hydrologic factors. In most practical situations, it is not considered feasible, due to the numerous influencing factors, to determine varying rainfall-runoff coefficients; rather, it is more practical for design and evaluation purposes to use a single coefficient for a particualr land-use over a given rainfall-intensity range. However, in order to circumvent a major portion of the unavoidable error created by using a constant rainfall-runoff coefficient, a method developed by the Hawaii Environmental Simulation Laboratory (HESL) of the University of Hawaii was utilized to determine representative storm water volumes under varying conditions (Lopez, 1974; Lopez and Dugan, 1975).

The HESL method is based on an incorporation of U.S. Soil Conservation Service (SCS) data and U.S. Weather Bureau data from the "Rainfall-Frequency Atlas of the Hawaiian Islands" (1962). The SCS data involves the use of soil maps (Foote et al., 1972) and SCS-derived curve numbers obtained from empirical data, including precipitation, soil and changing soil moisture conditions, and vegetative cover information frm the classified into four groups, labeled A, B, C, and D, with Class A having the highest water intake rates and Class D soils the lowest. These curve numbers, modified for Hawaiian conditions, pertain only to non-urban conditions. For urban conditions, the HESL method utilized information published by Miller and Viessman (1973).

Once the increase in surface water runoff volume had been established, it was necesary to determine the funoff quality for pre- and post-development conditions.

Inasmuch as there is no water quality information for storm water runoff from the predeveloped (1985) project area itself, nitrogen and phosphorus levels of 1.10 mg/L and 0.11 mg/L, respectively, were used for the present (1985) conditions. These values, which were based on information published by Loehr (1972), were derived from nitrogen outputs of 3 lb/acre-yr and phosphorus outputs of one order of magnitude less; an annual rainfall of 35-in.; and a rainfall-runoff coefficient of 0.3.

Representative suspended solids values in storm water runoff from the proposed predeveloped (1985) project area are again difficult to determine, inasmuch as it is commonly presumed, by mainly indirect methods, that the majority of the annual suspended solid load is carried by the heavy storm

water runoff events which tend to occur on an infrequent basis. For the present study the concentration of suspended solids was based on composite measured and estimated suspended solids load per unit area from various Oahu streams, including those out of the entire Kaneohe Bay Drainage Basin, as reported by Jones et al. (1971). Following this reasoning the suspended solids concentration value for predeveloped conditions for comparative purposes was set at 1,500 mg/L.

Quality data for urban storm water (post-development conditions) is sparse, both locally and nationally. Loehr (1974) compiles urban storm water runoff quality data collected from throughout the United States, as well as from a few international loctions. As expected, the data are diverse. Locally, Fujiwara (1973) reported urban storm water quality data collected from storm drains in different drainage areas of Honolulu, as shown in Table 1. For the present study, his results were used to simulate post development runoff quality, which were, respectively, 0.60, 0.57, and 250 mg/L, for nitrogen, phosphorus, and suspended solids. Attention is likewise drawn to the heavy metal content in residential runoff, especially with respect to iron, chromium, copper, lead, and zinc.

Applying these concentrations to the post-development runoff volues, the projected sediment and nutrient loads from the project site could then be estimated.

Table 1

Representative Storm Water Quality Data for a Honolulu Residential Area a/*

All units in mg/L except total coliform, fecal coliform, and fecal strep which are listed as No./100 mL.

Constituent	Concentration
Total Solids	511
Suspended Solids	252
COD	142
BOD	10
Dissolved Oxygen	7.1
NO_3-N	0.211
TKN	0.381
Total P	0.57
Ortho P	0.27
Grease	2.8
Lead	0.407
Chromium	0.013
Zinc	0.512
Copper	0.036
Iron	0.377
Total Coliform	83,000
Fecal Coliform	1,965
Fecal Strep	6,393

a/Storm water samples collected on Aupuni Street near Nuhelewai Stream.
* Values obtained from Fujiwara (1973).

SURFACE WATER RUNOFF ALTERATIONS

Quantity

The estimated storm water runoff and constituent changes due to the proposed Hawaii Kai Marina Zoning Project are shown in Table 2. The values presented, it must be emphasized, are for comparative purposes only, and are not intended to be representative of the accuracy implied by the practice of reporting results to one decimal place. This was done primarily for convenience of calculations and balancing.

The changes shown in Table 2 are those occurring only within the 97.8 acres covered by the proposed project site. No attempt was made to compare these changes with cntributions from the entire or contributing drainage area. In this situation, a comparison of the project site area to its entire draiange area would significantly negate apparent changes caused by the landuse change within the project site.

The mixed fill area which covers about 80% of the proposed site does not, because of its potential heterogeneous nature, have the previously discussed assigned SCS curve numbers that were based on the four classified groups (i.e. A, B, C, and D). However, the project's alluvium fill is considered to be representative by Class C soils. For conservative purposes, an average curve value for Class B (20% Koko Soil) and the presumed Class C for the 80% fill was assumed.

As can be readily observed in Table 2, the storm runoff volume for the 1 yr, 1 hr duration storm for post (full) development is 21 times greater than predeveloped (1985) conditions; however, as the storm duration and recurrence interval increases, this difference is that as the intensity and duration of the storm increases, the ability of the soil to accept water decreases which approaches the less permeable conditions that would normally occur under fully developed conditions (from roofs, sidewalks, etc.).

TABLE 2

Estimated Storm Water Runoff Volume and Constituent Changes due to the Proposed Hawaii Kai Development Marina Zoning Project, Oahu, Hawaii

Storm[a]			Storm Water Runoff															
Duration	Recurrence Interval	Quantity	Hydraulic			Nitrogen[b]				Phosphorus[c]				Suspended Solids[d]				
			Development			Development				Development				Development				
			1980	Full		1980	Full			1980	Full			1980	Full			
hr	yr	in	AF event	AF event	AF event	lb event	lb event	lb event		lb event	lb event	lb event		ton event	ton event	ton event	
1	1	1.6	0.4	8.4	+ 8.0	1.1	13.7	+ 12.6		0.1	13.0	+ 12.9		0.77	2.84	+ 2.07	
1	5	2.4	2.1	14.5	+12.1	6.4	23.6	+ 17.2		0.6	22.4	+ 21.8		4.34	4.91	+ 0.57	
1	10	2.7	3.1	16.8	+13.7	9.2	27.4	+ 18.2		0.9	26.0	+ 25.1		6.26	5.71	- 0.55	
1	25	3.2	4.9	20.7	+15.8	14.6	33.8	+ 19.2		1.5	32.1	+ 30.6		9.99	7.04	- 2.95	
1	50	3.5	6.1	23.1	+17.0	18.3	37.7	+ 19.4		1.8	35.8	+ 34.0		12.51	7.85	- 4.66	
1	100	3.8	7.5	25.5	+18.0	22.3	41.6	+ 19.3		2.2	39.5	+ 37.3		15.22	8.66	- 6.56	
24	1	3.9	7.9	26.3	+18.4	23.7	42.9	+ 19.2		2.4	40.7	+ 38.3		16.15	8.95	- 7.22	
24	5	7.3	27.2	53.7	+26.5	81.3	87.5	+ 6.2		8.1	83.2	+ 75.1		55.46	18.24	- 37.22	
24	10	9.0	38.5	67.5	+29.0	115.0	110.0	- 5.0		11.5	104.5	+ 93.0		78.42	22.92	- 55.50	
24	25	11.0	52.4	83.7	+31.3	156.8	136.5	- 20.3		15.7	129.7	+114.0		106.91	28.44	- 78.47	
24	50	13.0	67.0	100.0	+33.0	200.2	163.0	- 37.2		20.0	154.9	+134.9		136.52	33.96	- 102.56	
24	100	15.0	81.8	116.2	+34.4	244.7	189.2	- 55.5		24.6	180.1	+155.6		166.85	39.49	- 127.36	

a) From U.S. Weather Bureau "Rainfall Frequency Atlas of the Hawaiian Islands" (1962).

b) Based on a nitrogen value of 1.10 mg/L for 1985 conditions and 0.60 mg/L for "Full" development.

c) Based on a phosphorus value of 0.11 mg/L for 1985 conditions and 0.57 mg/L for "Full" development.

d) Based on a suspended solids value of 1500 mg/L for 1985 conditions and 250 mg/L for "Full" development.

As would be generally expected the greatest calculated incremental storm runoff volume 34.4 acre-ft/event) resulted from the 100-year storm with a 24-hour duration, as shown in Table 2. These values (acre-ft/event) represent a volume of water and should not be confused with peak discharge rates which represent the maximum volume of storm water runoff discharged per unit of time (e.g., cfs). Peak discharge rates are required for engineering design or proposed drainage facilities and ascertaining the capacity of existing facilities, while total runoff volume provides a more realistic estimate of impact on water quality.

Quality

Besides the changes in the volume of storm water runoff, the quality of the various constituents being transported is of equal, if not more importance. However, as previously mentioned estimates of water quality constituents resulting from significant storm water runoff that occurs at the most only a few times a year is very perplexing, especially since information on this subject essentially only became available at both the local and national level in the 1970's.

The summation of nitrogen, phosphorus, and suspended solids loads from both present (1985) and projected (full residential development for storms of 1- and 24-hour duration at recurrence intervals of 1-, 5-, 10-, 25-, 50-, and 100-years are shown in Table 2. The incremental changes per storm event for the present and projected development conditions for the various duration and recurrence interval storms indicate that from the least to the greatest amount of rainfall: nitrogen increases for the 1-hr duration storms and then decreases when the intensity (10 yr recurrence interval) of the storms increase; phosphorus increases from 12.9 lb/event to nearly 156 lb/event; and suspended solids shows increases of 2.07 and 0.57 tons/event, respectively, for the 1-yr and 5-yr recurrence interval storms (1-hr duration) and then decreases thereafter to about 127 tons/event for the 100 yr, 24 hr duration storm. The effect of the incremental hydraulic difference between the pre-and-post development conditions is also directly correlated with the water quality constituents.

It must be emphasized that the constituent values are only for comparative purposes, and should not be taken as absolute values. Overall then, the output of nitrogen is about the same and phosphorus is expected to increase in the runoff, while suspended solids, except for the lower intensity/duration storms, should tend to decrease between pre-and-post developed conditions. The decreased amount of exposed soil in residential areas tend to decrease the quantity of the suspended solids load at the higher intensity/duration storm events even though the total quantity of storm water increases.

The hydrologic and water quality aspects of the surface water runoff were only considered for the present and projected conditions. However, increases in constituent loads will undoubtedly result from construction activities, especially if a significant storm occurs during the interim period between earth moving operations and soil stabilization completion. The impact of construction activities can be minimized by adhering to strict erosion control measures.

Other water quality constituents of general concern include biocides and heavy metals. Typically, the biocides in general use tend to break down more readily in comparison to the more long lasting types of a few years ago; consequently, except for agricultural runoff, the types and concentrations are usually considered insignificant. On the other hand heavy meatals do apparently increase somewhat as a result of urbanization, however, the possible long-term effect, if any, that increased heavy metals may have upon the biological lofe of the receiving waters (Hawaii Kai Marina and the fronting ocean) at the concentrations expected in residential runoff (Table 1) is presently undefined.

REFERENCES

Division ofWater and Land Development. 1982. "Medium Rainfalls: State of Hawaii, 1982." Circular C88, Dept. of Land and Natural Resources, State of Hawaii.

Foote, D. E., et al., 1972. "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii," U.S. Dept. of Agriculture, Soil Conservation Service.

Fujiwara, T.D. May 1973. "Characterization of Urban Stormwater Discharge from Seprate Sewers," M.S. Thesis, Department of Civil Engineering, University of Hawaii, Honolulu, Hawaii.

Jones, B.L., R.H. Nakahara, and S. S. W. Chinn. 1971. "Reconnaissance Study of Sediment Transported by Streams, Island of Oahu," Circular C33, U.S. Geological Survey in cooperation with the Division of Water and Land Development, Dept. of Land and Natural Resources, State of Hawaii.

Loehr, R. C. December 1972. "Agricultural Runoff," ASCE Journal Sanitary Engineering Division, Vol. 98, SA6, pp. 909-925.

Loehr, R. C. August 1974. "Characterstics and Comparative Magnitude of Non-Point sources," Journal Water Pollution Control Federation, Vol. 46, No. 8, pp. 1849-1872.

Lopez, N. C. January 1974. "Estimating the Effects of Urbanization on Small Watershed Peak Discharges," Working Paper WP 73-001 Hawaii Environmental Simulation Laboratory, University of Hawaii, Honolulu, Hawaii.

Lopez, N. C. and G. L. Dugan. August 1978. "Estimating Peak Discharges in Small Urban Hawaiian Watersheds for Selected Rainfall Frequencies," Technical Memorandum Report No. 58, Water Resources Resources Research Center, University of Hawaii, Honolulu.

Miller, C. R. and W. Viessman, Jr. April 1973. "Runoff Volumes from Small Watersheds," Technical Release No. 55, U.S. Department of Agriculture.

U.S. Weather Bureau. 1962. "Rainfall-Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43, Washington, D.C.

APPENDIX B

ARCHAEOLOGICAL RECONNAISSANCE
of the
PROPOSED MARINA ZONING PROJECT
KALUANUI 1, 2, AND 3 (Hawaii Kai)

by

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and J. R. McNeill

report submitted to:

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May 1985

ABSTRACT

At the request of Environmental Communications, Inc., J. Stephen Athens, Ph. D., Archaeological Consultant, contracted to perform a preliminary document review and archaeological reconnaissance survey of proposed development areas designated Marina Zoning Project (Hawaii Kai Development) Kaluanui 1, 2, and 3. The field investigation, which required 17 man-days to complete, was performed by P. Price-Beggerly, Field Director, and J. R. McNeill, Assistant, between February 23 and March 22, 1985. The total project area, situated on the eastern slopes and adjacent flatlands of Kaluanui Ridge and Kamilonui Valley, contained ca. 36 acres. More generally, the fieldwork was conducted in Maunalua, District of Kona, Island of O'ahu, Hawaii, TMK 01:03:09:08.

The project area did not contain any sites listed on either the National Register of Historic Places or the Hawaii Register of Historic Places. During the field survey, nine archaeological sites and six possible sites were identified, mapped, and recorded. One of the sites is an historic habitation area; the remaining sites are inferred to reflect pre/proto historic utilization of the area. Three of these are caves, two are platforms (one associated with a free standing wall), one is a large terraced platform with associated petroglyphs, one is a series of low terraces which may be the historically documented Hawea Heiau, and the last is a complex of modified natural stone cavities. Six additional natural stone cavities were also identified, though it is uncertain whether these contain cultural material.

Document review, field inspection, and analysis indicate that all the sites and natural cavities will be directly or indirectly impacted by the proposed development. Recommendations include preservation and testing on one of the sites, testing and reevaluation on one site, salvage excavation on seven sites, and monitoring of selected areas during subsurface construction. It is also recommended that intensive survey be conducted on the slope of Kaluanui Ridge to locate additional natural cavities which may contain cultural materials. These should be sampled and reevaluated regarding the need for further research. No further work is recommended for the historic habitation site.

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ACKNOWLEDGEMENTS

The authors wish to acknowledge and thank the following people for their assistance and *kokua*: Dr. J. Stephen Athens and Dr. Joyce Bath for their many hours of administrative aid; Dr. Matthew Spriggs for his help in obtaining the field records for Sites O-5 and O-16 as well as his tour of O-16; Dr. Everett Wingert for lending us altimeters and for his aid in locating early aerials of the project area; Mrs. Leilani Pyle and Ms. Carol Kawachi who identified vegetation; Mr. Charles Okino of the State Survey Division for locating early maps of the area; Ms. Martha Yent and Mr. Earl "Buddy" Neller of the State Historic Preservation Office for their assistance and *kokua*; Mr. Bertell Davis for sharing his copy of the W. P. Thompson and E. H. map; Mr. Farley Watanabe whose sharp eyes spotted the first petroglyph; and last, but not least, Mr. David Welch and Rev. Ande Beggerly for their support and help in the field.

J. R. McNeill undertook all drafting.

INTRODUCTION

At the request of Environmental Communications, Inc., J. Stephen Athens, Ph.D., Archaeological Consultant, contracted to perform a preliminary document review and archaeological reconnaissance survey of proposed development areas designated Marina Zoning Project (Hawaii Kai Development) Kaluanui 1, 2, and 3. The field investigation, which required 17 man days to complete was performed by P. Price-Beggerly, Field Director, and J. R. McNeill, Assistant, between February 23 and March 22, 1985. Joyce E. Bath, Ph.D. also participated in the fieldwork on March 7, and Dr. Athens visited selected sites with Price-Beggerly and McNeill on March 22nd. A preliminary letter report of findings and tentative recommendations was sent to Mr. F. J. Rodriguez, of Environmental Communications, Inc., on March 11, 1985. The present document represents the final report of the reconnaissance and includes recommendations regarding nine archaeological sites and six natural features which might contain archaeological resources.

Description of Reconnaissance Area

The fieldwork was conducted in the Maunalua area, District of Kona, Island of O'ahu, Hawaii, in portions of Royal Patent No. 4475 and in portions of Land Commission Award 7713, Apana 30 (TMK 01:03:09:08). The total project area, situated on the eastern slopes and adjacent flatlands of Kaluanui Ridge and Kamilonui Valley, contained ca. 36 acres (Figure 1). Kaluanui 1 is bounded by Hawaii Kai Drive on the east, Kaluanui Road on the south, and Kaluanui Ridge on the north and west. Kaluanui 2/3 is bounded by Hawaii Kai Drive on the south, Kaluanui Road on the northeast, and by the slopes of Kaluanui Ridge on the north (see Figures 2 and 3).

The predominant vegetation in the survey area is *koa haole (Leucaena leucocephala)*, *kiawe (Prosopis pallida)*, a 'basil-like' shrub *(Ocimum gratissimum)*, and numerous species of grasses (Photos 1 and 2). The vegetation, particularly the grass, is especially dense in areas that appear to have been bulldozed or where landfill has recently been introduced.

Soils in the area are classified into three series. Koko silt loam (KsB) is found on the lower slopes of Kaluanui Ridge and is considered to be useful for homesites, truck crops, and pastures. Lualualei extremely stony clay (LPE) is the predominant soil on the upper slopes. It is considered to be prone to erosion and unsuitable for agriculture unless the stones are removed. The flatlands are composed of mixed Landfill (FL) (Foote *et al.* 1972).

Scope of Work

The scope of work for this research was limited to a preliminary document review and surface archaeological reconnaissance. Subsurface test excavations were not included in the scope of work.

An archaeological reconnaissance is essentially a walk-through survey of a defined area in which the landscape is visually inspected to ascertain if there are archaeological or historical resources. Coupled with a review of previous investigations, documents, and maps, this procedure allows the researcher to evaluate the significance of possible cultural resources and to determine the likelihood that these resources may be disturbed or damaged by construction and/or development activities. In addition, recommendations can be realistically formulated for any additional archaeological research that might be necessary.

With respect to the present project, the purpose of the reconnaissance survey may be summarized as follows:

1. To identify, locate, and report all surface archaeological and historical resources within the defined area.

2. To evaluate these resources and associated features in terms of their archaeological and historical significance.

3. To recommend actions to mitigate possible impacts which these resources may incur due to the proposed development.

4. To record data from those sites which do not warrant further research.

This report presents the results of the reconnaissance. It provides (1) a description of the resources identified, (2) an evaluation of the significance of the resources from a cultural and scientific point of view, (3) an analysis of artifacts and petroglyphs documented during the present research, and (4) recommendations concerning the need for further archaeological investigations. The purpose of the recommendations is to offer a means for mitigating adverse effects the resources may incur as a result of direct and/or indirect impacts caused by the proposed development of Kalusnui 1, 2, and 3.

BACKGROUND INVESTIGATIONS

Three extensive reviews of archaeological, historical, and traditional literature and documents pertaining to the Maunalua, O'ahu area have been produced recently. These are by Takemoto *et al.* (1975), Kelly *et al.* (1984), and Davis (1985).

The first, "Historical/Cultural Essay Report on the Kuapa Pond Area" (Takemoto *et al.* 1975) was prepared for the U. S. Army Corps of Engineers. It addresses, specifically, the immediate area of the Kuapa Pond which borders the proposed development area and, more generally, the *'ili* of Maunalua. The tasks included:

1. A reconnaissance survey of the literature, documents, and other historic knowledge of the subject area, i.e. Kuliouou Beach and Kaalakei Valley on the west to Kalama Valley on the east.

2. Historical research, including a translation of Hawaiian place names, inventory of early maps and photographs, and the identification of agricultural plants, habitation areas, pond structures, and other places mentioned by nineteenth century travelers to the area. Additionally, the analysis and interpretation of the writers of the nineteenth century was undertaken.

The second report, "Cultural Resources Overview for the Queen's Beach Park Feasibility Study, Maunalua, Kona, O'ahu" (Kelly *et al.* 1984), prepared for the department of Parks and Recreation, City and County of Honolulu, also addresses cultural resources in Maunalua. This report, adding to the knowledge presented by Takemoto *et al.* (1975), is divided into three sections: (1) the legends of Maunalua, O'ahu, (2) an archaeological assessment of the Kealakipapa Area (Queen's Beach), and (3) historical notes, which though focused on Queen's Beach, also include other places in Maunalua.

The third document "A Research Design for Pahua Heiau at Kamilonui in Maunalua, Southeastern Oahu" (Davis 1985) is intended to direct further investigation and restoration of Pahua Heiau. In addition to discussing proposed research, it addresses the background, historical setting, and previous archaeological investigations associated with this traditional religious structure.

In the Takemoto *et al.* (1975) report, archaeological investigation was confined to document and literature review. However, the methodology for locating and interpreting records concerning archaeological sites was rudimentary. This apparently consisted of reviewing McAllister's *Archaeology of Oahu* (1933) and consulting the State of Hawaii Survey records (survey conducted ca. 1970). This investigation,

obviously limited both in time and funding, concentrated on documenting "previously known" resources. Thus, it cannot be regarded as a good source of data upon which to base research conclusions about the presence, absence, or significance of archaeological resources. Additionally, it would seem the researchers neither checked the various sources of archaeological reports produced by private contractors and institutions, nor consulted published research located in professional journals. Their obvious unfamiliarity with the archaeological literature, and how to interpret what they found led them to erroneously assume that all the sites discovered by McAllister in the 1930s have been destroyed except the Koko Head petroglyphs (Takemoto *et al.* 1975:5, 32), and "the quantity and quality of the archaeological sites discovered in the area does not sigificantly help unfold the history of the Kuapa Pond region" (Takemoto *et al.* 1975:4).

The archaeological research reported in Kelly *et al.* (1984), which included fieldwork, was conducted in an area some distance from Kaluanui 1, 2, and 3, thus it has limited importance to the present research. However, the historical background research, discussed below, is quite pertinent to the present Kaluanui project.

Davis' (1985) report is particularly relevant to the present research as it addresses sites in the immediate vicinity of the research area. In addition, Davis discusses the importance of the area from an anthropological viewpoint, besides correlating the early historic descriptions with known archaeological sites.

The traditional and historical accounts of all the reports, are relevant to the present research since they address the 'land' of Maunalua in which the project area is located. In addition, land ownership research and chains of title, presented in two of the documents (Takemoto *et al.* 1975; Kelly *et al.* 1984) are pertinent to this research since the Kaluanui 1, 2, and 3 areas are also included in the lands awarded to Victoria Kamamalu in the *Mahele* of 1848 (L.C.A. 7713).

Since these three documents contain extensive and intensive review of the historical and traditional literature it would be redundant to review the same sources here. We have, therefore, limited this presentation to a brief historical background and identification of additional sources.

Historical Summary

The first known sighting of Maunalua Bay by Europeans is recorded by Nathaniel Portlock in 1786 when he and Captain George Dixon went ashore near Point Dick (Koko Head). Later they rowed along the coastline in search of a spring from which to obtain water and landed "admidst a vast number of the inhabitants" in the general vicinity of Kuapa Pond (Portlock as quoted in Takemoto *et al.* 1975). Subsequent writings by Mathison (1825) and Chamberlain (1826, 1828) in the early 1800s also mention the inhabitants of the area and villages that are located near Kuapa Pond. Davis (1985) believes that the village mentioned by Mathison, which contained 100 houses, was the same village

research area. The villages mentioned by Chamberlain, however, were thought by Davis (1985) to be located on a causeway separating the pond from the sea, and inland at the head of Kuapa Pond on the eastern shore near Pahua Heiau.

As noted by Davis (1985), the years between 1825 and 1860 are also of importance historically, since Maunalua was an anchorage for whaling ships and inter-island traders. It was here that they provisioned their boats with sweet potatoes.

A number of interesting references to the Maunalua area and Kuapa Fishpond are also found in traditional legends and historical literature. These references are addressed in both Takemoto *et al.* (1975) and Kelly *et al.* (1984) and will not be reiterated here.

Previous Archaeological Research

McAllister's 1930 survey is the earliest record of systematic archaeological research in the project area (1971, n.d.). He notes three sites within the immediate vicinity of Kaluanui 1, 2, and 3: Hawea Heiau (Site 42); a dwelling site at the mouth of Hahaione Valley (Site 43--Bayard's Site O-16), which incorporates a house foundation, a possible pigpen, and a stone faced well; and Keahupua-o-Maunalua Fishpond [Kuapa Pond] (Site 49). Portions of all of these sites have been visited during the present research. The Kuapa Fishpond lies to the west and south of Kaluanui 2/3 and to the south of Kaluanui 1. Site 43 is directly west of Kaluanui 2/3, and the present research suggests that Site 42 is located within the boundaries of Kaluanui 2/3.

The first scientific excavations in the vicinity of the present project area were also conducted by McAllister in the 1930s. He placed two pits into the dwelling platform of Site 43. From these excavations he recovered ash, charcoal, historic glass, fish scales, *kukui* shells, marine shells, and a pounder.

The next subsurface research was conducted on Site O-5 (State Site No. 50-80-15-2908) which is located within Kaluanui 1. This excavation was undertaken during 1962 and 1963 under the direction of Dr. Wilhelm G. Solheim II (1965). A detailed description of the excavation is located in the "Results of the Reconnaissance" section of this report.

Additional surface and subsurface research was conducted on McAllister's Site 43 in 1966 and 1967 by Dr. Donn Bayard (1969), then a graduate student at the University of Hawaii. Bayard notes that he was not familiar with McAllister's work at the time of this fieldwork. His Site O-16, therefore, incorporates some of the features described by McAllister, but omits others. Bayard describes O-16 as consisting of a major site area which includes a stone enclosure (11 x 5.5 m) associated with five cairns formed of large rocks with pebble fill, a stone wall, and two additional cairns farther up the slope to the east of the stone enclosure (Bayard 1969). Outside the major site area and situated on the western side of Kaluanui Ridge, Bayard noted five small rockshelters and a moderately well preserved house platform. These were incorporated

the western side of Kaluanui Ridge, Bayard noted five small rockshelters and a moderately well preserved house platform. These were incorporated into his O-16 site. Excavation was limited to the stone enclosure, which subsequently was interpreted to be that of an historic pigpen.

In 1969, when Bayard wrote his report, mention is made that the enclosure, which had been so carefully excavated in 1966-1967, was the pigpen described by McAllister in the 1930s (Bayard 1969). Bayard additionally identifies the five cairns and wall as the remains of the house platform that McAllister had excavated. Erroneously, however, he identified a modern well, which had cement incorporated into the surrounding rock wall, as the well described by McAllister. In actuality, Bayard's "well" is a "man hole" identified by Davis (personal communication) from a map dated 1932 and prepared by W. P. Thompson and E. H. McAllister's original well was located during the present research.

Archaeological research, including excavation and restoration, is presently being conducted at Pahua Heiau (McAllister's Site 39). This site is located on the ridge that separates Kamilonui from Kamiloiki. The work is being undertaken through the efforts of various community volunteers and university graduate students. Personnel from the Bishop Museum and the University of Hawaii are coordinating the effort (Davis 1985).

Several sources of information concerning the Maunalua area that are not included in either Takemoto *et al.* (1975) or Kelly *et al.* (1984) were found during the course of the present research. Since these sources may be of assistance to future investigators they will be noted here. Information regarding access to these references is noted in the "Bibliography" section of this report.

Archaeology of Oahu (McAllister 1971) originally published in 1933 is often cited as a source of archaeological data. Generally, the citation is limited to a description of the site as noted in McAllister's section "List of Sites". Further data regarding three of the sites within the survey area were noted in other sections of this publication as follows:

	State Site No.	Page No.
Hawea Heiau	50-80-15-0042	13, 14
Hahaione Valley--dwelling site	50-80-15-0043	24, 35
Keahupua-o-Maunalua	50-80-15-0049	28, 29

Additional description and a field sketch of Hawea Heiau was obtained from McAllister's field books. These books are located at the Bernice P. Bishop Museum Library.

Manuscripts, field notes, and photos by Bayard and Smart of investigations conducted at Sites O-16 and O-5 are presently located in the Archaeology Laboratory of the University of Hawaii. Artifacts recovered from Site O-5 are curated at Bernice P. Bishop Museum, while a

number of artifacts recovered from Site O-16 are housed in the Archaeology Laboratory of the University of Hawaii.

An interesting line drawing of Maunalua Bay, dating ca. 1841, is included in the microfilm version of James D. Dana's volume *Geology*. This microfilm may be viewed at Hamilton Library at the University of Hawaii (Microfilm 185 Reel 1 No. 2). An attempt was made to locate a copy of the original drawing in the documents archived in the Library's Pacific Room; however it appears that Dana's book, which was found, was bound incorrectly and does not contain this drawing.

The Saga of the Sandwich Islands, Vol. 1 by E. B. Scott contains a number of pictures of the Maunalua Bay Area. This publication is available in the Reading Room of the Department of Anthropology at the University of Hawaii.

Additional information regarding sites excavated in the Maunalua area may be found in Kenneth P. Emory and Yoshihiko Sinoto's *Oahu Excavations - 1961*.

An English translation (Mann and Cummins n.d.) of the Land Commission Award 7713 to Victoria Kamamalu was exhibited during the Engineering Week Display at Ala Moana Center. The document was displayed by the firm of Austin, Tsutsumi and Associates, Suite 900, 745 Fort Street Mall, Honolulu, Hawaii.

A sketch, dated May 1883, of the Kuapa Fishpond is included in the field book of George E. Jackson, Surveyor. A copy of this field book is located at the State of Hawaii, Historic Preservation Office.

METHODOLOGY

The fieldwork was divided into three tasks, as follows:

1. Reconnaisance.
2. Vegetation clearance.
3. Recording.

Reconnaissance

Kaluanui 1

Systematic transects were walked across the flatlands of Kaluanui 1 at ca. 12 m (40 ft) intervals to determine if any archaeological resources remained in this area of sparse vegetation (see Figure 2). Reconnaissance efforts were discontinued after a ca. 1960 photograph was located during concurrent background research. This photograph indicates the area had been subject to recent landfill and was a construction firm's maintenance shop and storage yard. The foot survey covered approximately 80% of the flatlands.

The slopes of Kaluanui Ridge were visually inspected up to an elevation of ca. 18 m (60 ft). Systematic transects were not possible due to dense vegetation, extremely steep slopes, vertical bedrock cliffs, and recent unstable soil avalanches. A total of 50 to 60% of the land area was covered by foot survey.

Kaluanui 2/3

Sweeps of the flatlands of this area were made on foot to assess the presence or absence of cultural resources (see Figure 3). A series of aerial photographs dating from 1952 through 1977 were consulted at the time of the survey. Research efforts were concentrated in areas that had not been radically altered by grading, and/or stockpiling of large piles of boulders, landfill, and rubbish. Dense vegetation covered approximately 95% of the flatland area.

The slopes of Kaluanui Ridge were inspected between ca. 6 to 21 m (20 to 70 ft) elevation above mean sea level . This area was less steep than Kaluanui 1, and did not contain any recent soil avalanches. Dense vegetation covers approximately 90% of the slopes. Sample size on these slopes was ca. 80%.

Peripheral Areas

A quick walk-through survey was made of adjacent areas to view known sites in the immediate vicinity of the project. This included an examination of McAllister's Site 43 (Bayard's Site O-16) which is adjacent to the Kuapa Pond.

Vegetation Clearance

Extremely dense vegetation was partially cleared from five sites. This was necessary to facilitate identification, documentation, and photography. Field numbers were assigned to each site. State of Hawaii Historic Register site numbers were later assigned to the field numbers after completion of fieldwork. Cross reference of these numbers is provided in this report (Table 1). Site numbers were not given to unmodified natural cavities that were spatially separated from other sites.

Recording

Sites and features were measured, described, and photographed. Bearings and back sights were taken to selected control points with a Suunto Optical Sighting Compass and checked with an Embeeco Compass Bearing Monocular. Bearings, adjusted to true north, may vary by an unknown factor due to the presence of high voltage powerlines along the roadways of Kaluanui 1, 2, and 3 and on the slopes of Kaluanui 1. Elevation data were recorded from readings obtained from a Thommen altimeter. The altimeter was calibrated to sea level each morning and checked for variation in the evening upon completion of the day's work. All elevation data in this report should be considered as an approximation of elevation above mean sea level due to instrument and environmental fluctuation.

Field Records

Field records, photographs, artifacts, and all other materials generated during this reconnaissance survey are archived at the office of J. Stephen Athens.

Table 1. Classification and Cross Reference of Sites

Field No.	State No. 50-80-15-	Kaluanui Area	Site Type	Site Condition	Abbreviated Recommendation
0001	2900	2/3	Terraced Platform	Dense vegetation Excellent integrity	Test and Preserve
0002	0042?[1]	2/3	Terraces	Dense vegetation Poor condition	Test and Evaluate
0003	2902[2]	2/3	Cave	Minimal disturbance	Total Excavation
0004	2905	2/3	Natural Cavity	Undisturbed	Total Excavation
0005	2903	2/3	Wall and Platform	Minimal disturbance	Test and Excavate
0006	2904	2/3	Platform	Minimal disturbance	Test and Excavate
0007	2906	1	Historic Habitation	Abandoned and collapsed	No Further Work
0008	2908[3]	1	Cave	Excavated -- artifacts in backfill	Total Excavation
0009	2907	1	Walled Cave and Platform	Minor cultural disturbance	Total Excavation
0010	2901	1	Dirt-filled Natural Cavity	Cultural disturbance	Total Excavation
A,B,C, D,E	none	1, 2/3	Natural Cavity	Undisturbed	Locate and Sample

[1] McAllister (1971) site number
[2] Bayard (1969) Site No. O-16 Feature E
[3] University of Hawaii Site No. O-5

RESULTS OF THE RECONNAISSANCE

A total of nine archaeological sites and six natural stone cavities possibly containing cultural material were recorded within Kaluanui 1, 2, and 3. The sites and the natural features are described below; they include three caves, one free standing wall with associated platform, one platform, one terrace platform complex, one terrace complex, one modern historic habitation area, one modified natural stone cavity complex and six possible burial areas within natural stone cavities.

State Site No. 50-80-15-2900
Survey Area: Kaluanui 2/3

Field No. 0001
Figure Nos. 3 through 5
Photo Nos. 3 through 8

Terraced Platform

This site, a large 26 x 34 m (85 x 112 ft) terraced platform, is located on the lower seaward extremities of the Kaluanui (Mariner's) Ridge toe approximately 185 m (610 ft) northward of the Hawaii Kai Drive centerline marker "Δ" at a bearing of 320 degrees TN. The modified portion of the slope extends from approximataely 6 m (20 ft) above mean sea level to approximately 15 m (50 ft) elevation.

The culturally constructed exterior perimeter of the site is a retaining wall fabricated of basalt boulders with dimensions ranging between 23 and 160 cm (9 to 64 in) where exposed. This wall functions to contain naturally and culturally transported soils and sediments in a relatively level configuration. The wall boulders are dry-stacked either on top of the natural *pahoehoe* lava outcrop or on the surrounding talus slope. Enclosed within the perimeter retaining wall are two areas of paving (Feature 3 and a component of Feature 1) and three levels of terracing (Feature 1). The eastern terrace paving (Feature 3) measures ca. 2 x 8 m (6.5 x 26 ft) where exposed. It is composed of angular to subangular blocky basalt cobbles and is located on the upper surface of the platform. The southern paving (Feature 1) measures ca. 2 x 7 m (6.5 x 23 ft) where exposed. It is composed of larger subrounded cobbles and small boulders laid upon portions of three associated terraces. The lower two terraces (Feature 1) are constructed of stacked stones while the upper terrace is an elaborated lava outcrop (Feature 2). Possibly the most outstanding architectural feature of this site is a curve which was constructed into the seaward portion of the retaining wall. The stones in this curved portion of the wall are extremely well fitted and form a straight almost perpendicular surface along the exterior face. This architectural feature appears to be unique, as no other example of similar features in dry-stacked walls could be located by the authors in the archaeological literature of Hawaii.

Cultural features located on top of the platform (Feature 2) include a basalt cobble paving and localities where the *pahoehoe* has been

modified by the addition of petroglyphs. These include characterizations of humans, animals, and inferred symbolic representations. On the surface of the site upslope of the major structural features at approximately 15 m (50 ft) elevation is a "U" shaped feature (Feature 4). The "U" shape is composed of single stacked stones on the short side. In the northwest corner the boulders are layered to form a 'cupboard-like' compartment. Feature 4 measures 1.6 x 1.26 x 3.05 m (64 x 50 x 111 in). There are petroglyphs located approximately 4.5 m (15 ft) east of this feature and two areas of abraded *pahoehoe* lie between Feature 4 and Feature 3.

Artifactual material found on the surface of the site includes three pieces of volcanic glass, a basalt flake/core, two basalt spheroids, five basalt flakes, three historic glass fragments, a metal .22 caliber shell casing, metal nails, and the rusted springs of a bed.

Marine materials found on the surface of the site include two pieces of coral and one shell fragment.

The site is situated on a ridge toe comprised of talus and basalt *pahoehoe* lava flow with interspersed areas of soil and sediment. It is bounded on the east and south by stockpiles of large, 1 to 3 m (3 to 10 ft), boulders and piles of rubbish which include vehicles and other large discarded items. On the west an abandoned roadbed parallels the retaining wall and terraces. Seaward of the road are portions of the Kuapa Pond and archaeological Site O-16 (McAllister's Site 43). The northern boundary is less well known at this time due to the presence of very dense thorny vegetation.

During preliminary reconnaissance, vegetation obscured at least 80% of the site, including the walls, terraces, and associated features. Identified vegetation includes: night blooming cereus *(Hylocereus undatus)*, bougainvillea *(Bougainvillea)*, *koa haole (Leucaena leucocephala)*, *kiawe (Prosopis pallida)*, *milo (Thespesia populnea)*, *ilima (Fallax*, Walpers*)*, lantana *(Lantana camara)*, a 'basil-like' shrub *(Ocimum grattissimum)*, and various grasses such as *Rhynchelytrum repens* and *Chloris sp.* Vegetation was cleared from approximately 20% of the site to facilitate identifying, mapping, photographing, and recording the various features of the structure.

This site is a well preserved, large, impressive, complex platform with associated terraces, walls, petroglyphs, and an enclosure.

Little is known about this previously unrecorded site's history or function; however, its location, size, construction details, and complexity suggest it was associated with individuals of high status or places and/or events of importance.

It is considered to be a highly significant site worthy of preservation based on:

1. Its potential to yield scientific data important to the history and prehistory of the Hawaiians.

2. Its integrity and potential value for interpretive and cultural purposes.

3. Its uniqueness as represented by the masterfully fitted curve on the exterior retaining wall which adds to knowledge of Hawaiian architectural techniques.

4. Its value as a representative of petroglyph art on O'ahu. The petroglyphs also make it somewhat unique, since only fourteen petroglyph sites have been recorded for the island of O'ahu, and the location of three of these is unknown at this time (Cox 1970; Neller, personal communication).

A high status site (Hawea Heiau) is believed to be located within the research area. Site 50-80-15-2900 however, is not situated where a map drawn by W. P. Thompson and E. H. in 1932 places the Hawea Heiau. Additionally, the dimensions of this site do not correlate with McAllister's (n.d.) field drawing for a site he believed to be Hawea Heiau, nor does it contain elements which McAllister recorded as present on Hawea, i.e., a pit in the lower terrace and abundant coral within the walls and on the surface of the terraces.

State Site No. 50-80-15-0042?
Survey Area: Kaluanui 2/3

Field No. 0002
McAllister No. 42 (Hawea Heiau?)
Figure No. 3

Terraces with Associated Basalt Boulder Alignments

This site is located approximately 175 m (578 ft) from the centerline of Hawaii Kai Drive along a bearing of 100 degrees TN from the U.S.G.S. Kuapa signal located on Kaluanui (Mariner's) Ridge.

The exposed portion of the site consists of two terrace remnants which are bounded in three areas by non-contiguous small basalt boulder alignments. The terrace surfaces consist of alluvial sediments, fragments of slightly weathered coral, and two areas of subangular to subrounded basalt cobble and small basalt boulder paving. In three places non-contiguous, single stacked, basalt boulder alignments are exposed along the margins of the terraces.

The site is situated on an alluvial outwash which is bounded on the east by a ridge and on the west by an erosional channel which appears to be of recent origin. The present immediate surroundings of this site indicate gross modern alteration of the landscape. South and southwest of the site are stockpiles of large, 1 to 3 m (3 to 10 ft) boulders and rubbish piles which include vehicles. To the east a virtual mountain of landfill has been deposited. A roadbed (Kaluanui Road) has been constructed along the inferred northern boundary of the site and a concrete-lined channel has been constructed at the base of the roadbed.

During the reconnaissance, visibility of the ground surface was very poor due to the presence of dense vegetation. The site was covered

with a mixed open to closed canopy of *koa haole (Leucaena leucocephala)* and *kiawe (Prosopis pallida)* with an understory of ca. 1 to 2 m (3 to 6 ft) grasses and shrubs.

Preliminary historical research suggests that the site may be the remnants of the Hawea Heiau. This *heiau* was mentioned by Thrum in a 1906 publication of the *Hawaiian Almanac and Annual*. He stated the structure measured 75 ft square but was "now all gone" due to the reuse of the stone for building walls (Thrum 1906a:45). McAllister (1971), however, relocated the site during the early 1930s and sketched the western portion. His field notes and sketches (n.d.) suggest that the remnants of the structure, designated Site 42, measured approximately 20 x 12 m (65 x 40 ft).

During recent archaeological research in Hawaii Kai, Bertell Davis located a 1932 Bishop Estate map surveyed by E. H. and W. P. T. (W. P. Thompson), that places a *heiau* in the Kaluanui 2/3 area of the present reconnaissance. Using McAllister's map and notes and the W. P. Thompson and E. H. map, transects were walked across the area in an attempt to locate Site 42 *heiau*. Although extremely disturbed, the *heiau* has certain characteristics, described by McAllister (1971, n.d.), that might enable identification of the structure if it still exists. These include quantities of coral on the surface, basalt alignments, terraces, and an inferred pit in the surface of one of the terraces. Unfortunately, however, the reconnaissance nature of the present project disallowed sufficient time to clear the dense vegetation for adequate mapping and description of features associated with the site. Thus, positive identification of it as McAllister's Site 42 was not possible.

The signficance of this site rests on the possibility that it may represent a remnant of a traditional Hawaiian religious structure, namely Hawea Heiau. Due to the limited nature of the present research it is premature to determine the signficance of this site in its present condition--or to even state this is a portion of the Hawea Heiau. As a preliminary assessment it might be noted that if this is the *heiau*, very little is left of the structure recorded by McAllister (1971). Unless future research locates additional portions of the *heiau* its value for interpretive purposes, is minimal. From the standpoint of its research potential, some data such as the sequence of construction, its function, its place in the chronologic sequence of the region, and cultural behavior associated with religious structures may still be gained from future research.

State Site No. 50-80-15-2902
Survey Area: Kaluanui 2/3

Field No. 0003
Bayard Feature No. O-16E?
Figure No. 3
Photo Nos. 9 and 10

Cave

This site is a large cave with a two section opening. It is located on the Kaluanui Ridge slope approximately 18 m (60 ft) above mean sea level. The overhang measures 7 m (23 ft) across. There is a 1.7 m (5.5 ft) distance between the floor and the bottom of the overhang and the associated ledge is 2.5 m (8 ft) deep. A passageway extends a minimum of 3.5 m (11 ft) into the mountain from the eastern section of the cave opening. The exposed ledge floor is composed of fine-grained, wind blown sediments, and basalt bedrock. There was no apparent subsurface disturbance, however there was a rotted piece of canvas on the ledge floor, the tube contained two 2 x 4 x 8 ft lengths of lumber, and rotted lumber was present on the talus slope below the cave opening.

This cave may be Feature E of Site O-16 identified by Bayard (1969) in his 1966-67 research.

Vegetation on the slopes below the cave is quite dense and includes *kiawe, koa haole,* shrub and grasses.

The function of this cave is unknown at this time. It is large enough to have been utilized by the early Hawaiians as a habitation and/or burial area.

If the cave contains buried cultural material, it would afford an excellent opportunity to address important questions regarding the influence of a semi-arid ecosystem on human behavior and conversely, the impact which human manipulation of portions of the environment may have had on the ecosystem. It may also yield data which can be utilized to establish the time, duration, and intensity of occupation and associated cultural behavior of the immediate area as well as to help place it in a regional context.

State Site No. 50-80-15-2905
Survey Area: Kaluanui 2/3

Field No. 0004
Figure No. 3

Natural Stone Cavity

This feature is an erosional cavity located at an elevation of ca. 27 m (80 ft) in the vicinity of a basalt stone wall (State Site No. 50-80-15-2903). The cavity was probably formed by the erosion of a basalt outcrop during a higher sea stand. It measures 95 cm (3 ft) high and is a minimum of 2.5 m deep (8 ft).

Vegetation in the immediate area includes dense grasses and shrubs.

No cultural material was found either within the exposed portion of the cavity or on the slopes below it. This cavity has been designated a

site based on its spatial relationship with Site 50-80-15-2903 rather than the knowledge that it represents cultural modification of the natural feature.

It may now or in the past have contained human burial remains which are considered significant in both a scientific and cultural context.

State Site No. 50-80-15-2903
Survey Area: Kaluanui 2/3

Field No. 0005
Figure No. 3

Wall with Possible Associated Platform.

This site is a dry-stacked, free standing basalt stone wall (Feature 1) located on the talus slope of Kaluanui Ridge. Its lower end begins at about 9 m (30 ft) elevation and continues upslope and inland at a bearing of 340 degrees TN to approximately 15 m (50 ft) elevation. The dimensisons of the actual wall vary because in places it abuts bedrock which has been incorporated into the wall. Generally it is 40 to 50 cm (18 to 20 in) wide, and ca. 60 to 100 cm (24 to 40 in) high. It extends for about 20 to 25 m (65 to 82 ft) in length and then merges with a field of basalt outcrops. Loose boulders are scattered at the base of the wall on the lower slopes. Approximately midway upslope from the lower portion of the wall is an area that contains angular basalt stones which appear to be a paving (Feature 2). This inferred paving abuts and is retained by the wall and forms a platform-like feature. Natural talus in this area is similar in form and size to the inferred paving and the feature may be talus deposits which have naturally eroded from the upper slopes and been stopped from further movement by the wall.

Vegetation surrounding the wall consists of very dense grasses on the lower slopes with brush, grass, and vines the predominant vegetation on the upper slopes.

Cultural material associated with the wall and possible platform include sawn wooden fence posts and barbed wire. A fence constructed of posts between which wire is strung begins downslope of the lower boundary of the wall. The wire is stretched upslope along and on top of the wall; however, here it is fastened to trees growing on the margins of the wall rather than on fence posts.

Based on the size, condition, and location of the wall it may represent a proto or early historic land use boundary. It does not appear to have originally been a retaining wall to include or exclude cattle or other domesticated animals as it would easily have been bypassed on both its upper and lower extremities until the wire fence extended the length and height of the barrier.

This site is considered signficant because it contains the potential to yield information regarding the cultural behavior of early Hawaiians, especially as it pertains to settlement patterns, land use, and the utilization and manipulation of a semi-arid ecosystem. It may also yield material which can be utilized to establish the time, dura-

tion, and intensity of occupation and associated cultural behavior within this area, as well as furnishing data which will allow us to place the site in a regional context.

State Site No. 50-80-15-2904 Field No. 0006
Survey Area: Kaluanui 2/3 Figure No. 3

Possible Platform

This site appears to be the remnant of a basalt platform. It is located on a moderately steep portion of the talus slope of Kaluanui Ridge between Site 50-80-15-2902 and Natural Stone Cavity E. It lies ca. 220 m (726 ft) from the Hawaii Drive centerline marker "Δ" at a bearing of 337 degrees TN. Elevation is ca. 13 to 16 m (40 to 50 ft) at the base of the retaining wall.

The most dominant feature of the site is a concentration of angular to subangular basalt boulders and cobbles which form a paving. This paving abuts an alignment of subrounded basalt boulders on its downhill margin which functions as a retaining wall. The total site measures approximately 3 x 5 m (10 x 16 ft). The exposed downhill portion of the retaining wall measures ca. 50 cm (20 in) high.

The predominant vegetation upon the site is dense grasses and shrub. The surrounding area is covered with an open canopy of *kiawe* and *koa haole* trees with an understory of dense shrub and grass.

A coil of rusted barbed wire was found lying on the inferred paving. No traditional artifactual material was found within this area.

The size, condition, location, and construction of this site suggests it may represent the remnant of a structural foundation for a field house. Very little time or effort would have been needed to construct the feature as it is fairly small and is formed of materials which are abundant in the immediate area.

The site is significant because in the context of other sites within this area it contains the potential to yield data regarding settlement, land use, economic, and habitation patterns associated with the traditional Hawaiian culture. It may also provide material which can be radiometrically analyzed to establish the time, duration, and intensity of occupation of this area and help place it in a regional context.

State Site No. 50-80-15-2906 Field No. 0007
Survey Area: Kaluanui 1 Figure No. 2
Photo No. 11

Modern Habitation Area (ca. 1940 to 1970)

This site is an abandoned and collapsed historic habitation area. It is located along the modified talus slopes and on the adjacent alluvial outwash plain of an unnamed gulch which drains a portion of the Kaluanui Ridge. It is best located by walking across the flat, graded area of Kaluanui 1 to two large banyon trees which are predominant features within this project area.

The site extends over an area of ca. 40 x 36 m (131 x 118 ft) and includes a number of components, i.e., a roadbed, a concrete curb, asphalt paving, barbed wire fencing, a collapsed lattice roof, an animal coop, a collapsed wooden structure, assorted historic rubbish piles, and a tree house located in one of the banyon trees.

Structural components such as the lattice roof, animal coop, collapsed wooden structure, and the wire fence are located on the lower portion of the modified talus slope. The remainder of the features and the tree house are associated with the alluvial outwash plain.

Very dense vegetation is present in all portions of this site which lie outside the canopy of the two banyon trees. The predominant vegetation is 1 to 1.8 m (4 to 6 ft) grass and *koa haole*. Other species represented include bamboo, vines, bougainvillae, and various unidentified shrubs.

An unusually large basalt boulder (maximum base size is 4 m (13 ft), height 3 to 3.5 m (9 to 11 ft)) abuts the primary trunk of one of the banyon trees. This boulder was examined for the presence of petroglyphs but none were found.

A ca. 1960 photograph of this site was located (archived with the U. H. Site 0-5 reports noted below) and is included in this report (Photo 11). This photograph indicates the area was utilized as a plant garden or nursery with an associated lath house, wood shed, and animal pen.

State Site No. 50-80-15-2908 Field No. 0008
Survey Area: Kaluanui 1 University of Hawaii No. 0-5
Figure No. 2

Cave

During previous research this cave was interpreted to represent a habitation and burial cave. Abundant artifactual material was noted on the surface of this site during the present research, even though the site was excavated during 1962 and 1963, as discussed below.

It is situated on the talus slope of Kaluanui Ridge at an elevation above mean sea level of ca. 24 m (80 ft). The cave may be reached by walking across the open field toward the talus slope of Kaluanui Ridge at a bearing of 268 degrees TN from the intersection of Hawaii Kai Drive and Maka'a Street. The cave (rock shelter) was probably formed by the erosion of a basalt outcrop during a higher sea stand. Its opening measures 10 m (33 ft) across the front and it is 5 m (16 ft) from the edge of the slope along the floor to the rear wall. A second small cavity is located at the right margin of the main opening. The floor of the cave appears to be relatively undisturbed since its excavation in the 1960s. Artifactual material not collected during that excavation is still abundant in the matrix of the backfill.

The predominant vegetation present on the periphery of the site is *koa haole* and shrub. On the lower portions of the slope the predominant vegetation is high (1.3 m (4 ft)) grass and *koa haole*.

The excavation of this site, which yielded an abundance of significant cultural material was directed by Dr. Wilhelm G. Solheim II (1965) during 1962 and 1963. As a final report and analysis of the excavation were never completed, the following information has been extracted from unpublished notes and excavation reports presently archived in the Archaeology Laboratory, Department of Anthropology, University of Hawaii.

Preliminary analysis of the excavation data (Smart 1964; Bayard 1965) suggests a five phase occupational sequence for the cave with each phase separated by a deposit of sterile wind blown sediments. Radiometric analysis of organic material excavated from the matrix of the second phase of occupation indicates an initial use of the cave sometime prior to ca. A.D. 1300. A second charcoal sample extracted from the middle layer suggests a ca. A.D. 1700 date for this phase. Historic artifacts found on the surface are evidence of recent utilization.

The artifactual data recovered from this site was especially rich. One hundred and seven artifacts were recovered and catalogued. In addition, an unknown number of sea urchin spines, unworked shark teeth and unworked stone flakes were neither recorded nor catalogued. The most common artifacts encountered were coral files of which there were fifteen. Also well represented were perforated dog canine teeth; eleven of these were recovered.

Stone tools recovered included: one waterworn basalt hammer stone, one small quadrangular adze, two basalt files/saws, one volcanic glass flake which was inferred to have been used as a knife, two basalt knives (one triangular and one semi-trapezoidal), seven adze chips, eight rubbing stones, one large grindstone, and three fragments of whetstone.

Household implements were represented by two stone *poi* pounders, a fragment of a gourd vessel, two *ulu maika* stones, a length of sennit cordage, and six basalt mirror fragments. Bayard (1965) suggests that the fragments represent five separate mirrors which were ca. 8 cm in diameter when whole.

Fishing equipment was represented by six sinkers, one octopus lure point, six worked pieces of bone inferred to be fishhook blanks, five fishhooks or hook fragments, and a turtle shell netting mesh guage.

In addition to the perforated dog teeth noted above, five other ornaments were found: three cone shell beads and two perforated shells inferred to have been used in *leis*.

A preliminary distribution analysis of the artifacts produced by Bayard (1965) indicates that the majority of the artifacts (42) were recovered from the upper layers of the site, seven of which were surface finds. Smart (1964) notes, however, that the site had been vandalized and clear stratigraphic provenience was available for only eight artifacts.

Preliminary analysis of the artifactual and economic data leads Smart (1964) to conclude that the harsh environment of southeast O'ahu forced the inhabitants of the cave to rely heavily on fishing and collecting of seafood for their subsistence. He suggests that the early occupation of the cave was of a temporary nature while later the site functioned as a permanent habitation area much like a dwelling structure would in an open site.

During our brief visit to this site thirty-six pieces of volcanic glass were collected from the surface of the backfill dirt. Although a few specimens of this material were collected during the 1960s research, the importance of this type of artifact for technological research and/or as specimens for dating was not recognized in Hawaiian archaeology until later. A preliminary analysis of the specimens collected is presented in the "Artifact Analysis" section of this document.

This cave is recognized as a significant site which has already yielded a great deal of data valuable from both a cultural and scientific viewpoint. Further, it is known to contain additional valuable data regarding pre-Contact Hawaiian technology and therefore, it remains a significant archaeological resource.

State Site No. 50-80-15-2907
Survey Area: Kaluanui 1

Field No. 0009
Figure Nos. 2 and 6
Photo Nos. 12 and 13

Modified Cave (Cavity) Complex

This site is a modified cave complex which is located at an elevation of 24 to 30 m (80 to 100 ft) on the talus slope of Kaluanui Ridge. It can be reached by following a bearing of 306 degrees TN from the intersection of Hawaii Kai Drive and Onohi Street for a distance of approximately 70 m (231 ft).

There are nine components in the complex which include: two modified cavities (cave), a rock wall, a basalt cobble and boulder platform, an area of paving and/or entrance blockage, and four natural stone cavities located upslope from the cave entrances.

The primary component of the site is a large basalt outcrop which contains two modified erosional cavities near the present ground level. The seaward opening "A" measures 55 cm (22 in) across and is a minimum of 80 cm (32 in) deep. The second opening "B" which is 80 cm (32 in) inland of the first cavity is 75 cm (30 in) across and a minimum 1 m (3 ft) deep. In front of the openings to the cavities is a four course, basalt boulder, dry-stacked wall (Feature 1) which partially restricts access to the cavities. This wall is ca. 55 cm (22 in) high, 80 cm (32 in) deep, and 4 m (13 ft) long. The wall begins at the seaward edge of the outcrop and extends inland across the exterior face of the bedrock. The platform (Feature 3) is defined by an alignment of boulders which forms a right angle near the seaward portion of the wall and extends downslope a distance of ca. 3 m (10 ft) it then turns at a right angle seaward for an undetermined distance. This inferred platform is covered by talus, heavy vegetation, and fallen *kiawe* tree branches, which made precise investigation of this feature impossible. It will, therefore, require further research to define its exact form and function.

Atop the basalt outcrop is Feature 2 which measures 80 cm (26 in) across and 2.3 m (7 ft) long. This feature appears to be a paving of angular and subangular basalt cobbles; it may, however, function to block or camouflage an additional entrance to the cavities partially exposed on the face of the outcrop. Four additional natural stone cavities are located upslope of this site. None of these appear to be culturally modified but they may contain subsurface cultural material.

Preliminary analysis of this site suggests that it may have functioned both as a habitation and a burial area. This complex is considered a significant site based on its potential to yield information regarding Hawaiian cultural patterns associated with this immediate area plus information which will help us place it in a regional context. Information may also be gained regarding technology, settlement pattern, land use, subsistence in a semi-arid environment, and Hawaiian mortuary practices. Further, it may yield material for dating analyses, which would provide information on the time, duration, and intensity of occupation.

State Site No. 50-80-15-2901 Field No. 0010
Survey Area: Kaluanui 1 Figure No. 2

Modified Natural Stone Cavity Complex

This site is located on the talus slope at an elevation of approximately 18 m (60 ft). It is ca. 6 m (20 ft) below and slightly seaward of Site 50-80-15-2908. The complex contains an unknown number of naturally occurring erosional cavities which have been formed at the base of a basalt outcrop. These natural features have been culturally packed with sediments which partially obscure the conformation of the cavities.

Predominant vegetation on this portion of the slope includes *koa haole*, dense grass, and shrub.

No midden or artifacts other than the cultural manipulation of the cavities were found in the proximity of this site.

The form, location, and the inferred cultural modification of this site suggest that these cavities may contain human burials which are considered significant both scientifically and culturally.

State Site No. NONE Field Nos. A, B, C, D, E
Survey Area: Kaluanui 1 and 2/3 Figure Nos. 2 and 3
Photo Nos. 14 and 15

Natural Stone Cavities (Unmodified)

A number of natural stone cavities and cavity complexes were located during the reconnaissance in addition to the stone cavities which contain cultural materials (Site No. 50-80-15-2901), or which are associated with another site (Site No. 50-80-15-2905). The identification and map location of all these cavities was not possible in view of the time allocated for the fieldwork. The reconnaissance did indicate that these features may be expected to be located at the base and within most of the basalt outcrops located above ca. 9 m (30 ft) elevation. The outcrops are the major land form on the upper slopes of Kaluanui 1, 2, and 3 and literally hundreds of cavities are expected to be found during subsequent research in this area. Five of these cavities or cavity complexes are addressed here and are noted on the Site Location Maps (Figures 2 and 3).

These natural features are considered potentially significant since they may contain human burials as well as other cultural material.

ARTIFACT ANALYSIS

A total of fifty-four portable artifacts were gathered from the surface of the research area during the reconnaissance (Table 2); thirteen from Site 50-80-15-2900 and forty-one from Site 50-80-15-2908 (University of Hawaii No. 0-5). Three of these artifacts are clearly historic in origin, while fifty-one are assumed to reflect pre/proto historic utilization and manufacture. Abundant historic artifacts were encountered in the research area, but were not collected. The presence of these artifacts is noted in this section and/or in the site descriptions. The temporal relationship between sites in the survey area is unknown. Each site, is therefore, discussed as a separate entity.

State Site No. 50-80-15-2900 Survey Area: Kaluanui 2/3

Thirteen artifacts were collected from the surface of various features of this site. Feature 1 yielded two historic and three pre/proto historic specimens.

Artifacts associated with historic utilization of the area include a fragment of a clear glass bottle which has the letter "C" contained within a diamond molded into the base and a .22 caliber brass shell casing with the letter "P" inscribed on the base. This initial probably indicates that it was recently manufactured by the Peters Firearms Company.

Artifacts presumed to represent pre/proto historic utilization collected from Feature 1 include two basalt flakes and one piece of volcanic glass. One of the basalt flakes is a very large (105 mm long, 96 mm wide, 56 mm thick), triangular shaped flake/core which displays a striking platform, portions of cortex, several flake scars, and an area of battering. The location, size, weight, density, and battering scars suggest it may have been used to manufacture the petroglyphs in the immediate vicinity, or possibly, it is a core from which flakes were manufactured. The second basalt flake measures 48 mm long, 31 mm wide, and 20 mm thick. It contains evidence of a striking platform, bulb of percussion, seven flake scars, and inferred use-wear scars on two of its margins. The remaining artifact collected from this feature is a volcanic glass flake which contains two flake scars.

One small coral pebble, measuring 17 mm maximum, was also recovered from Feature 1.

Collected from the surface of Feature 2 were three pre/proto historic artifacts. These include two basalt flakes and one piece of volcanic glass. One small (29 mm maximum) coral pebble was also recovered.

Table 2. Tabulation of Artifacts Recorded

SITE NO.	HISTORIC		PRE/PROTO HISTORIC		
	Glass	Metal	Basalt Flake/Core	Basalt Spheroid	Volcanic Glass
50-80-15-2900					
Feature 1	1	1	2	-	1
Feature 2	1*	2*	2	-	1
Feature 4	1	1*	2	1/1*	1
50-80-15-2908 (U.H. 0-5)	-	-	5	-	36

* Artifacts recorded but not collected.

The basalt flake measures a maximum of 22 mm long and 18 mm wide. One of the pieces of volcanic glass contains only slight evidence of cultural manipulation; the second one, while still retaining two cortex surfaces, has seven clear flake scars.

Additional historic materials were noted on this feature but not collected. They include a non-diagnostic historic glass fragment and modern two-headed nails.

Five artifacts were recovered from the *pahoehoe* lava in the vicinity of Feature 4. These include two basalt flakes and one piece of volcanic glass, one basalt spheroid and one piece of historic glass. A basalt spheroid located near Feature 4 was recorded but not collected. The spring portion of a rusted bed frame was also noted in the area adjacent to Feature 4.

The collected basalt spheroid measures a maximum of 55 mm, and is made of vesicular basalt with many fine pores. A notable amount of oxidation is present on the surface which was exposed to sunlight.

The larger of the two basalt flakes measures a maximum of 55 mm. It contains five flake scars and two of its margins are possibly damaged by use. The second basalt flake measures a maximum of 31 mm across its longest axis. It appears to be debitage, but there may be use-wear along one of its margins.

One piece of volcanic glass was recovered near the petroglyphs in the vicinity of Feature 4. The maximum length of the specimen is 28 mm. A striking platform, a bulb of percussion and seven flake scars are observable on its surface and cortex remains on two of the facets.

State Site No. 50-80-15-2908 Survey Area: Kaluanui 1
University of Hawaii No. O-5

Forty-one pre/proto historic artifacts were collected from the surface of the backfill of this cave. This inventory includes thirty-six pieces of volcanic glass and five basalt flakes. The specimens of volcanic glass range from large (39 x 27 x 22 mm) chunks of raw material to very fine (10 x 8 x 1 mm) flakes. Five of the six large chunks have flake scars on their surfaces and possibly functioned as cores. An additional large piece shows no evidence of cultural manipulation.

Little can be said regarding the possible geologic source of this volcanic glass collection, as sources of volcanic glass have not been published for this area. One of the large chunks, however, appears to be similar to the outer surface of a *pahoehoe* lava flow. A second unusual specimen is a medium size (29 x 9 x 29 x 20 x 8 mm), trapezoidal basalt flake which has a fine (3 x 20 mm) band of volcanic glass along one of the margins. A bulb of percussion and portions of the cortex are also evident on this flake. The presence of these two specimens in this site may indicate that volcanic dikes were not the only geologic features being exploited by the early Hawaiians to obtain this raw material.

Preliminary analysis indicates that volcanic glass may have been an important component of the artifactural inventory of this site. If our brief surface collection of thirty-six volcanic glass samples and five basalt artifacts is added to the total 107 artifacts catalogued from this site during the 1962-63 excavation, then volcanic glass represents at least 24% of the inventory.

The basalt flakes recovered from this cave include the one mentioned above, which contained a band of volcanic glass on its margin, three flakes inferred to represent debitage and one small flake (21 x 17 x 9 mm) which has two polished surfaces. This polished flake may be a fragment from an adze or chip from one of the basalt mirrors recovered from this site in the 1962-63 excavation.

PETROGLYPH ANALYSIS

Fifteen petroglyphs have been identified on the *pahoehoe* lava outcrops which are incorporated into Site 50-80-15-2900. These images are somewhat unique since only fourteen petroglyph sites have been recorded for the island of O'ahu and the location of three of these is unknown at this time (Neller, personal communication; Cox 1970). An additional group of images was found in a nearby area, during the present research, on a stone incorporated into the walls of a rectangular feature within Site O-16. This feature, excavated by Bayard in 1966-67 (Bayard 1969), was identified by McAllister (1971) in the 1930s to be an historic pigpen. The petroglyph stone, and others within the pigpen walls may have been removed from Site 50-80-15-2900 during the construction of the pen prior to the 1930s. This practice of removing building materials from existing structures to be incorporated into new structures, was, and is, a well documented practice.

A definitive study of Hawaiian petroglyphs offered by Cox (1970) is helpful in analyzing these images. In his research, a number of characteristics associated with the location, distribution, stylistic variation, and possible temporal use of this art form are presented.

Cox suggests that the majority of these features are located on fields of *pahoehoe* lava or large rounded boulders. They are usually found in clusters and are almost always limited to the dry sides of islands.

The method of producing the glyphs appears to be restricted to four techniques. Pecking or incising by the use of a sharp instrument and bruising or abrading the stone with a blunt tool.

Glyphs are known to exist in a variety of configurations. Most numerous are human figures. Some of these appear to represent supernatural beings, especially those with fantastic heads or head-dresses. Also frequent, are symbolic dots and circles which are found in various groupings such as rows, circles or concentric relationships confined within boundaries. Animals are also represented in glyphs, these include images of dogs, turtles, birds and chickens. The rarest of glyphs are those of fish. Cox (1970:32) indicates that, "in all the islands only two or three are distinguishable."

Several petroglyph varieties have been identified on Site 50-80-15-2900 (Figure 5, Photos 7 and 8) and the adjacent Site O-16 (McAllister's Site 43). In concurrence with Cox's finding, the most numerous images identified on Site 50-80-15-2900 are those of human figures (Petroglyphs 3, 4, 6, 7, 11, 12, and 13). Also abundant, are dots and circles, but, other than those associated with Petroglyph 9 it is unclear whether these symbols are correlated with other glyphs. An unusually high percentage, 19% (three figures), of glyphs on the Kaluanui sites are of fish. The presence of such a large percentage of "rare" fish glyphs

might be explained by the close spatial relationship of these sites to the Kuapa Fishpond. If this was so, however, one might expect fish petroglyphs to be present at other fishpond sites. The fish glyphs on Site 50-80-15-2900 are represented by a fine-lined, incised glyph (Petroglyph 5) which appears to have been incised with a metal tool, and a pecked fish glyph (Petroglyph 14). Both of these fish are located on the surface of the main terrace of the site. The third fish image is located on the boulder incorporated in the rectangular feature of Site O-16. An additional animal figure is represented by a dog glyph (Petroglyph 2a) which abuts another glyph at a right angle (Petroglyph 2b), although this glyph is a linear style it corresponds in form to the dog petroglyphs present in Nuuanu Valley (McAllister 1971).

Figures which have been inferred to represent supernatural images have also been identified on Site 50-80-15-2900. These include a possible bird-head figure (Petroglyph 2b) which is similar to the bird-head figures found on a boulder in Moanalua, O'ahu (Cox 1970:76; McAllister 1971:Plate 10). A second image is inferred to be a representation of the traditional Hawaiian god *Lono* (Petroglyph 9). This glyph corresponds closely to *Lono* figures identified at Puako and Puuloa, Hawai'i. The *Lono* images are characterized by a vertical body line with a cross bar. They often have dots or circles spatially related to the image. These figures closely resemble the wooden image of *Lono* which was adorned with white *kapa* streamers and carried about the island during the *Makahiki* processions as illustrated in Malo (1951). A further supernatural feature may be represented by Petroglyph 1 which appears to have an elaborate head-dress attached to an unusually shaped head.

It has not been possible, as yet, to establish other than a relative time sequence for petroglyph art. That the art form continued into historic times, is evidenced by numerous glyphs depicting material culture introduced after European contact i.e., goats, horses, sailing ships, guns, anchors, numbers, and letters. The initial introduction of the practice of petroglyph art into the Hawaiian culture, however, is unknown. In an attempt to establish a chronologic order in which the images could be placed, Cox offers a relative time sequence based on research conducted in other design media such as *kapa* making, sculpture, and feather work. He states, "the Hawaiian artists were on an ever ascending development in perfection of techniques, refinement, and elaboration of forms" (Cox 1970:57). In his evolutionary model, which is limited to art forms where the image is an end in itself, the form of image begins with a simple and occasionally crude figure. The abstract images are elaborated through time to more complex forms which convey subtler meaning. Thus, the earliest forms are simple angular figures which progress to triangular and columnar figures with angular muscles. He further suggests, that through time, petroglyph styles assume curved boundary lines and muscularity, this evolution culminates in relief figures which are incised below the surface of the stone.

From a stylistic standpoint, the glyphs located on these two sites fall within Cox's continuum of simple to complex. Six of the glyphs located on Site 50-80-15-2900 can be designated as representations of the earliest period of Cox's sequence. These petroglyphs (Petroglyphs 1, 2a, 3, 4, 7 and 13) are simple linear angular figures. Four addi-

tional figures (Petroglyphs 6, 8, 11, and 12) are typical of the next stage of development, where the torso of the human figures is represented by triangular outlines. The third level of Cox's development model is represented by Petroglyph 2b which appears to be a human figure with a curved body and a bird-head. The recent historic end point of Cox's seriation is represented on Site 50-80-15-2900 by the use of metal tools to incise the fish petroglyph (No. 5) and by the possible representation of a recently introduced animal associated with a human figure (Petroglyph 8). This latter image appears to be a human figure seated on an animal. A similar historic depiction of a mounted rider is located at Anaehoomalu, Hawai'i. The Hawai'i petroglyph, however, is more elaborate and quite clearly indicates the artist's intent to depict a horse and rider.

It is premature to attempt to propose a definitive date for the construction of Site 50-80-15-2900 or utilization of the area for petroglyph art. Based on the style, method of production, and the subject matter associated with the petroglyphs, however, it would appear, using Cox's model, that site utilization extended from an undefined early Hawaiian traditional past through the period of historic contact.

SUMMARY AND RECOMMENDATIONS

Three areas of proposed development have been investigated, Kaluanui 1, 2, and 3. Archaeological resources have been found within the boundaries of each area. A definite areal pattern can be discerned as most of the sites are located along the talus slope of Kaluanui (Mariner's) Ridge, rather than on the alluvial plain or on the former boundaries of the Kuapa Pond. The two exceptions to this pattern are McAllister's Site 42 (Hawea Heiau - State Site No. 50-80-15-0042) and an abandoned recent habitation area, Site 50-80-15-2906. This pattern does not reflect the absence of Hawaiian occupation and/or land use, but rather the modification of the area by grading, land fill, and boulder storage, which destroyed or buried archaeological sites that probably previously existed in the area.

This pattern--the total lack of sites in lowland areas of Kamilonui Valley--extends across the valley mouth where extensive modern development has occurred. Only on the higher slopes of the ridge dividing Kamilonui from Kamiloiki are there remnants of sites which indicate former pre-European use of the valley. These include: one *heiau* (Pahua Heiau), a small rock shelter (McAllister Site 40), and a series of small terraces (Davis 1985). Travelling westward, little is left of the large early Hawaiian settlement depicted on Jackson's 1884 map and reported by McAllister (1971: 69), which existed at the mouth of Hahaione Valley. This valley is literally covered from wall to wall with modern development extending far inland and along both talus slopes. The wholesale loss of cultural resources tends to accentuate the value of the few remaining sites in an area important to Hawaiian culture as reflected in its traditions and history. This makes it even more important that the cultural resources which are left be recovered or preserved.

The proposed development, as indicated on the Draft Conceptual Plan, is expected to directly or indirectly impact or destroy nine archaeological sites and six possible sites located within or adjacent to the development area. The recommendations offered below, will help mitigate the adverse effects which construction, development, and subsequent occupation will have on these sites.

Historical research should be continued, concurrent with the archaeological field research, to locate sources which are useful in reconstructing the history and prehistory of this area, but which have not been noted by Takemoto *et al.* (1975), Kelly *et al.* (1984) or this report. Additional historical information is especially needed regarding the Hawea Heiau and the previously unrecorded terrace/platform complex (Site 50-80-15-2900). To aid future research and to prevent duplication of effort, the bibliography in this report lists sources consulted, rather than references cited.

Testing, when noted below, is defined as limited sub-surface excavation to determine the presence or absence of buried cultural deposits, and a sample of their vertical and horizontal limits. This phase of investigation should include dating of appropriate samples and preliminary analyses.

Recommendations for future archaeological field research have been classified into seven categories and tabulated in Table 3.

In all categories which include excavation in this table, it is highly recommended that a research design be formulated prior to excavation. This research design should set forth the theoretical framework, purpose, methodology, and goals of subsequent research. Future investigation might address, but need not be limited to, questions of the following nature:

1. Is there evidence of large scale geomorphological change associated with human habitation of this area?

2. How did the early Hawaiians culturally adapt to a semi-arid environment?

3. What were the settlement, subsistence, and land use patterns of the early Hawaiians of this area? Are these patterns different from those in adjacent areas or areas of similar environment?

4. What is the chronologic framework of human utilization of this area? How does this compare to the regional framework?

5. What was the nature of the occupation of this area by traditional Hawaiians? Does the data reflect permanent long-term habitation or was the area exploited during brief seasonal occupation? Does the archaeological record suggest that all classes of early Hawaiians lived here, or is there differentiation based on status, age, or gender?

6. What is the function of each site? What is its relationship to other sites in the immediate vicinity?

7. What type of technology was used to exploit this ecosystem? Does it differ from technology used on other areas which have a similar environment? Does it differ from technology used in other areas which have a different environment? Are there changes through time? What are these changes?

8. Is there evidence of trade with other areas of Hawaii or Polynesia? Where did the occupants of Site 50-80-15-2908 (U.H. O-5) obtain their volcanic glass?

Table 3. Classification of Recommendations

1. Test and Preserve	Sites in this category are considered to be highly valuable archaeological, cultural and scientific resources which retain a high level of integrity. Testing is required to determine the limits of the site, to remove valuable scientific data, and to gather information upon which interpretations can be based.
2. Test and Evaluate	Little is known of the sites in this category, therefore limited excavation is recommended until the site is defined and reevaluated.
3. Test and Excavate	Sites in this category appear, on the surface, to contain valuable archaeological data but they have not been subject to subsurface testing. Testing is necessary to determine the presence and/or absence and the horizontal and vertical extent of inferred cultural deposits. Excavation should be preceeded by the preparation of a research design which explicitly addresses specific archaeological problems and/or questions.
4. Total Excavation	Sites that are known to contain valuable archaeological data which are expected to be destroyed by construction or damaged by indirect impact. Testing is required to determine the presence and/or absence and the vertical and horizontal extent of cultural remains. Excavation should be preceeded by the preparation of a research design which explicitly addresses specific archaeological problems and/or questions.
5. Locate and Sample	The results of the present research indicate further features of this nature are present on Kaluanui Ridge slopes and are likely to contain human burials which should be removed and placed in an appropriate repository.
6. Monitoring	Monitoring during construction is recommended for: areas adjacent to sites; areas covered with landfill, boulders and/or rubbish; during the time when material located near sites is being removed; and when construction excavation is being conducted.
7. No Further Work	This recommendation is applied when information gained by further research is expected to be minimal.

State Site No. 50-80-15-2907 Survey Area: Kaluanui 1

Modified Cave (Cavity) Complex

It is unknown if proposed development of Kaluanui 1 will directly impact this site. The development and subseqsuent occupation of the area probably will endanger the integrity of the site by making it accessible to 'treasure hunters' and disturbance by children playing.

The site is quite obviously an example of cultural modification of natural features. Further archaeological research, which should include the following, is recommended for the complex.

Removal of vegetation from the site under the direct supervision of a professional archaeologist. When the site is clear, a detailed, instrument-generated map should be produced which delineates the site's boundaries and locates, identifies, and records its various features. When this is completed and the various components of the site are known, a research design should be prepared which sets forth the theoretical framework, purpose, methodology, and goals of subsequent research. Future research should include, but not be limited to, excavations conducted on the slope adjacent to the cave (cavities) entrance; in the inferred platform (Feature 3), and within the cave. Removal of a portion of the wall (Feature 1) will be necessary to gain entrance into the cave. Material which may be useful in dating the construction of the wall and subsequent blockage of the passages may be uncovered during removal of this wall. It is further suggested, that Feature 2 be dismantled to determine if it camouflages an additional entrance to the cave.

State Site No. 50-80-15-2901 Survey Area: Kaluanui 1

Modified Natural Stone Cavity Commplex

It is unknown if construction within Kaluanui 1 will directly impact this complex. The development and subsequent occupation of the area is expected to make these cavities accessible to 'treasure hunters'. Since it is suspected that these filled cavities contain burials, further work is appropriate.

It is recommended that this complex of dirt filled stone cavities be excavated to determine if they contain human burials or other cultural materials. If burials are encountered, they should be removed and placed in a repository so they will not be subject to desecration or misuse.

State Site No. NONE Survey Area: Kaluanui 1, 2, and 3
Field Nos. A, B, C, D, and E

Natural Stone Cavities (Unmodified)

These field numbers designate natural stone cavities which may contain human remains or other cultural material. They are, generally, located at the bases and within basalt outcrops which are abundant on the slopes of the project area. Thick vegetation grows on the downhill slopes and in crevices adjacent to the cavities thus obscuring them from view. The proposed development will probably not directly impact these features. Indirect impact is expected, however, due to the subsequent occupation of the area when they will be accessible to 'treasure hunters' and children exploring and playing on the slopes.

It is recommended that an intensive examination of the slopes be conducted to identify and locate the sampling universe of these features. A significant random sample should then be thoroughly examined to determine if human burials or other cultural material are located within the sampled features. The information gained from the sampling should then be analyzed and used as a data base for reevaluation and further recommendations regarding the unsampled features.

If human burials are found during the sampling research, they should be removed and placed in an appropriate repository.

BIBLIOGRAPHY

Barrow, T.
1967 "Material Evidence of the Bird-Man Concept in Polynesia." In *Polynesian Culture History*, edited by Genevieve A. Highland *et al.* Bernice P. Bishop Museum Special Publication 56. Honolulu: Bishop Museum Press.

Bayard, Donn
1965 Unpublished notes. In "Hawaii Kai [O-5]," compiled by Wilhelm G. Solheim II. Document filed in Archaeology Laboratory, Department of Anthropology, University of Hawaii.

1969 "Limited Survey and Excavation at Site O-16, Hawaii-Kai, Maunalua, Oahu." Manuscript filed in Archaeology Laboratory, Department of Anthropology, University of Hawaii.

Beckwith, Martha
1976 *Hawaiian Mythology*. Honolulu: University of Hawaii Press.

Campbell, Archibald
1967 *A Voyage Round the World from 1806 to 1812*. Honolulu: University of Hawaii Press.

Chamberlain, Levi
1826 Diary Insert 1. Manuscript filed in Hawaii Mission Children's Society Library.

1928 Diary Insert 2. Manuscript filed in Hawaii Mission Children's Society Library.

Cox, J. Halley with Edward Stasack
1970 *Hawaiian Petroglyphs*. Bernice P. Bishop Museum Special Publication 60. Honolulu: Bishop Museum Press.

Davis, Bertell D.
1985 "A Research Design for Pahua Heiau at Kamilo-nui in Maunalua, Southeastern Oahu." Manuscript filed in Department of Anthropology, University of Hawaii.

Emory, Kenneth P. and Yoshihiko Sinoto
1961 *Oahu Excavations - 1961*. Bernice P. Bishop Museum Special Publication 49. Honolulu: Bishop Museum Press.

Foote, D. E. *et al.*
1972 *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U. S. Department of Agriculture, Soil Conservation Service. Washington: U. S. Government Printing Office.

Fornander, Abraham
1973 *An Account of the Polynesian Race: Its Origins and Migrations and the Ancient History of the Hawaiian People to the Time of Kamehameha I*, Vol. II. Rutland, Vermont and Tokyo: Charles E. Tuttle Company.

Handy, E. S. Craighill
1940 *The Hawaiian Planter*, Vol. 1. Bernice P. Bishop Museum Bulletin 161. Honolulu: Bishop Museum Press.

Handy, E. S. Craighill and Elizabeth Green Handy
1972 *Native Planters in Old Hawaii*. Bernice P. Bishop Museum Bulletin 233. Honolulu: Bishop Museum Press.

Hudson, Alfred E.
1932 "Archaeology of East Hawaii." Manuscript filed in Bernice P. Bishop Museum Library.

Ii, John Papa
1959 *Fragments of Hawaiian History*. Honolulu: Bishop Museum Press.

Kamakau, Samuel Manaiakalani
1968 *Ka Po'e Kahiko [The People of Old]*. Bernice P. Bishop Museum Special Publication 51. Honolulu: Bishop Museum Press.

1976 *Na Hana a ka Po'e Kahiko [The Works of the People of Old]*. Bernice P. Bishop Museum Special Publication 61. Honolulu: Bishop Museum Press.

Kelly, M. *et al.*
1984 "Cultural Resources Overview for the Queen's Beach Park Feasibility Study, Maunalua, Kona, O'ahu." Report prepared for the Department of Parks and Recreation, City and County of Honolulu, Hawaii.

Kirch, Patrick Vinton
1979 *Marine Exploitation in Prehistoric Hawaii*. Pacific Anthropological Records No. 29. Honolulu: Bishop Museum Press.

Kuck, Loraine E. and Richard C. Tongg
1972 *Hawaiian Flowers and Flowering Trees: A Guide to Tropical and Semitropical Flora*. Rutland, Vermont and Tokyo: Charles E. Tuttle Company.

Lamb, W. Kaye, editor
1984 *Voyage of George Vancouver 1791-1795*, Vol. 2. London: Hakluyt Society.

Malo, David
1971 *Hawaiian Antiquities Moolelo Hawaii*, translated by Nathaniel B. Emerson. Bernice P. Bishop Museum Special Publication 2 (2nd Edition). Honolulu: Bishop Museum Press.

Mathison, Gilbert Farquhar
1825 *Narrative of a Visit to Brazil, Chile, Peru, and the Sandwich Islands During the Years 1821 and 1822 with Miscellaneous Remarks on the Past and Present, and Political Prospects of those Countries.* London: Charles Knight.

McAllister, J. Gilbert
1971 *Archaeology of Oahu.* Bishop Museum Bulletin 104 (2nd Edition). Honolulu: Bishop Museum Press.

n.d. Unpublished field notes. Filed in Bernice P. Bishop Museum Library.

Moberly, Ralph Jr. and Theodore Chamberlain
1964 *Hawaiian Beach Systems.* Hawaii Institute of Geophysics. Honolulu: University of Hawaii.

Moberly, Ralph Jr. *et al.*
1963 *Coastal Geology of Hawaii.* Hawaii Institute of Geophysics. Honolulu: University of Hawaii.

Newman, T. Stell *et al.*
1970 *Hawaii Register of Historic Places Bibliography of Hawaiiana.* Hawaii State Archaeological Journal 70-3. Honolulu: Department of Land and Natural Resources, Division of State Parks.

Pukui, Mary Kawena, Samuel H. Elbert and Esther T. Mookini
1974 *Place Names of Hawaii.* Honolulu: University of Hawaii Press.

Scott, E. B.
1968 *The Saga of the Sandwich Islands*, Vol. 2 (4th Edition). Crystal Bay Lake, Nevada: Sierra-Tahoe Publishing Co.

Sinoto, Aki
1979 "Cultural Resources Survey of New Dredged Material Disposal Sites at Barber's Point, Oahu, Hawaii." Report prepared for U. S. Army Engineering Division, Pacific Ocean. ms. 050179 Department of Anthropology, Bernice P. Bishop Museum.

Smart, Colin
1964 Unpublished notes. In "Hawaii Kai [0-5]," compiled by Wilhelm G. Solheim II. Document filed in Archaeology Laboratory, Department of Anthropology, University of Hawaii.

Solheim II, Wilhelm G., compiler
1965 "Hawaii Kai [0-5]." Document filed in Archaeology Laboratory, Department of Anthropology, University of Hawaii.

Sterns, Harold
1978 *Quaternary Shorelines in the Hawaiian Islands.* Bernice P. Bishop Museum Bulletin 237. Honolulu: Bishop Museum Press.

Stewart, C. S.
1970 *Journal of a Residence in the Sandwich Islands During the Years 1823, 1824, and 1825.* Honolulu: University of Hawaii Press.

Summers, Catherine and Elspeth Sterling
1978 *Sites of Oahu.* Department of Education, State of Hawaii and the Department of Anthropology, Bishop Museum. Honolulu: Bishop Museum Press.

Takemoto, Anne H. *et al.*
1975 "Historical/Cultural Essay Report on the Kuapa Pond Area." Report prepared for U. S. Army Corps of Engineers, Honolulu.

Thrum, Thomas G.
1906a "Heiaus, Heiau Sites Throughout the Hawaiian Islands." *Hawaiian Almanac and Annual*, pp.33-48.

1906b "Tales from the Temples," Part 1. *Hawaiian Almanac and Annual*, pp. 49-68.

1938 "Complete List of Heiau (temples) and Sites." *Hawaiian Almanac and Annual.*

Westervelt, William D.
1967 *Hawaiian Legends of Old Honolulu.* Rutland, Vermont and Tokyo: Charles Tuttle Company.

Additional Documents

Dana, James D.
1841 Line drawing of Maunalua Bay. In *Geology.* Microfilm 185 Reel 1 No. 2. Filed in Hamilton Library, University of Hawaii.

Jackson, George E.
1883 Unpublished field book sketches of Kuapa Fishpond, Oahu, Hawaii. Filed in Historic Preservation Office, State of Hawaii.

Mann, Clive and Patrick Cummins, translators
n.d. The *'Ili* of Maunalua Land Commission Award to Victoria Kamamalu. L.C.A. 7713, Vol. 10, Page 446, Apana 30. Displayed at Ala Moana Center by the firm of Austin, Tsutsumi and Associates, Suite 900, 745 Fort Street Mall, Honolulu, Hawaii.

Maps

Chapman Desai Sakata, Inc
1985 Draft Conceptual Plan, Kaluanui 1, 2, and 3. Hawaii Kai development plans for Kaiser Development Company.

Hawaiian Government Survey
1884 East Coast of Oahu including Waimanalo Hanauma and Maunalua Bays. Registered Map 1019. Scale 1:12,000.

Mann, James B.
1921 B. P. Bishop Estate. Showing boundary between the *'ili* of Maunalua and Kuliouou 2, Oahu.

Park Engineering, Inc.
1971 Kaluanui 2/3 Subdivision. Grading plan.

Stringer, David G.
n.d. Kaluanui 1 Subdivision. Topographic plan.

E. H. and W. P. T.
1932 Estate of Bernice P. Bishop. Showing positions of Maunalua, Koolaupoko, Oahu.

Tryck, Nyman and Hayes, Inc.
1974 Kaluanui 3 Subdivision. Topographic survey of Section 1 and 2.

Webster, William
1851 Plan of the Land of Maunalua in Oahu the Property of Victoria Kamamalu. Registered Map 980.

U. S. G. S.
1959 Koko-Head, Hawaii. Scale 1:24,000. With historic site notations from Historic Preservation Office.

1978 Koko-Head, Hawaii. Orthophotograph. Scale 1:48,000.

1983 Koko-Head, Hawaii. Scale 1:24,000.

Aerial Photographs

R. M. Towill Corporation (6097-2). Dec. 1977.

Undesignated aerial photographs -- located in Geography Department, University of Hawaii.

DACE-1-95	Jan. 1952	EKM-2CC-254	Jan. 1963
DACE-1-111	Jan. 1952	EKM-2CC-255	Jan. 1963
DACE-1-112	Jan. 1952	Oahu 6-12000	May 1969
7284-17	ca. 1977	Oahu 6-12000	May 1969

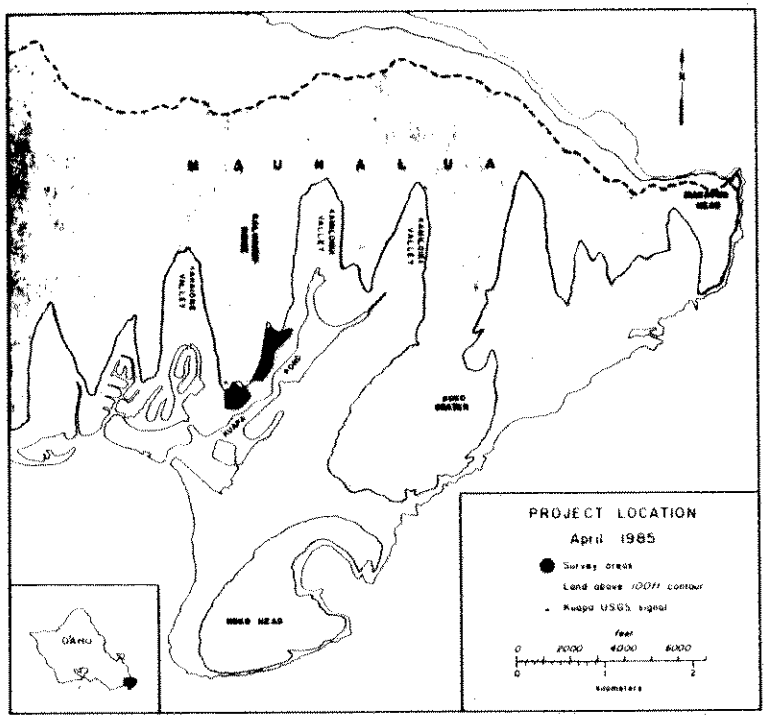

Figure 1. Based upon a U.S.G.S. topographic map.

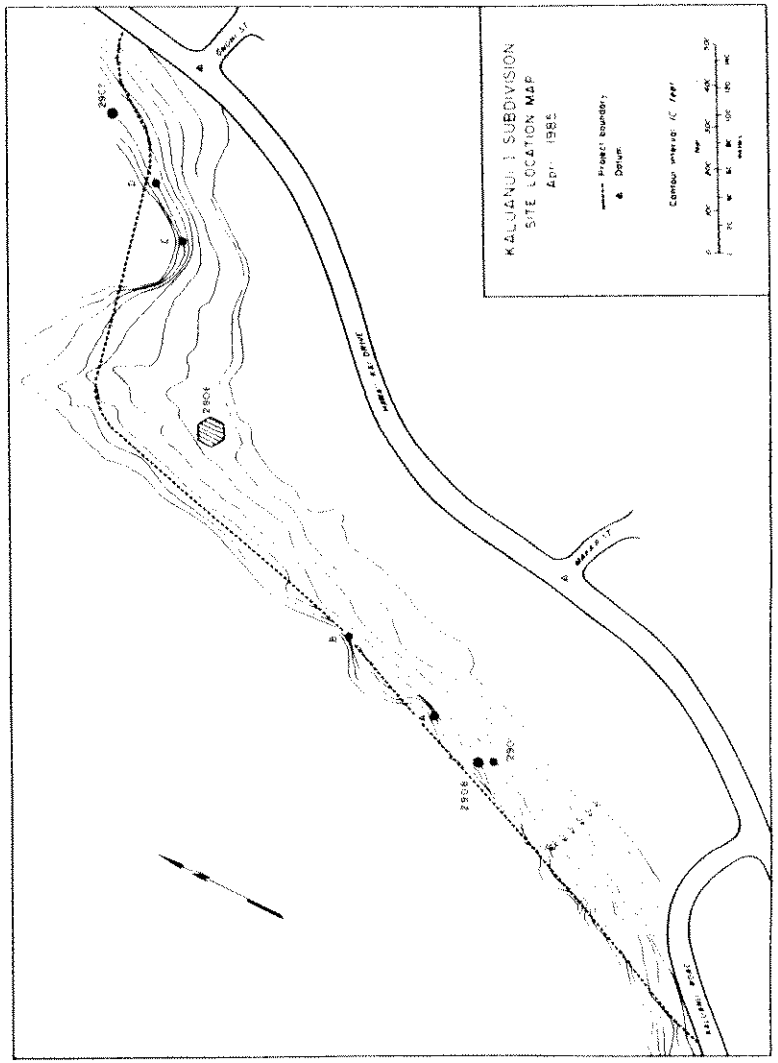

Figure 2.

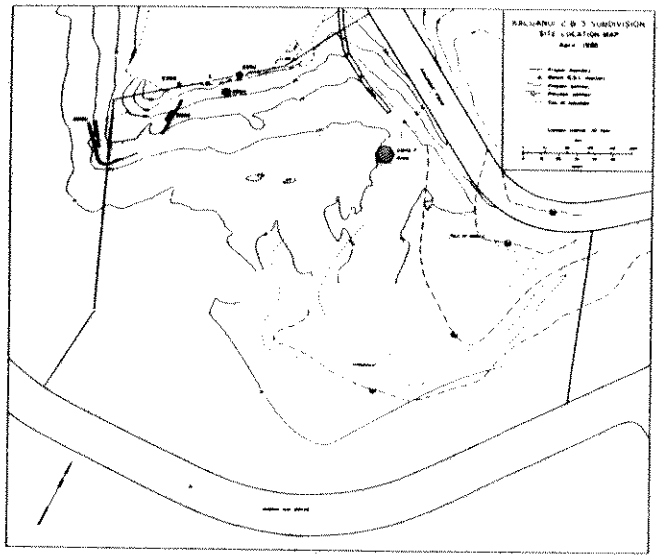

Figure 3.

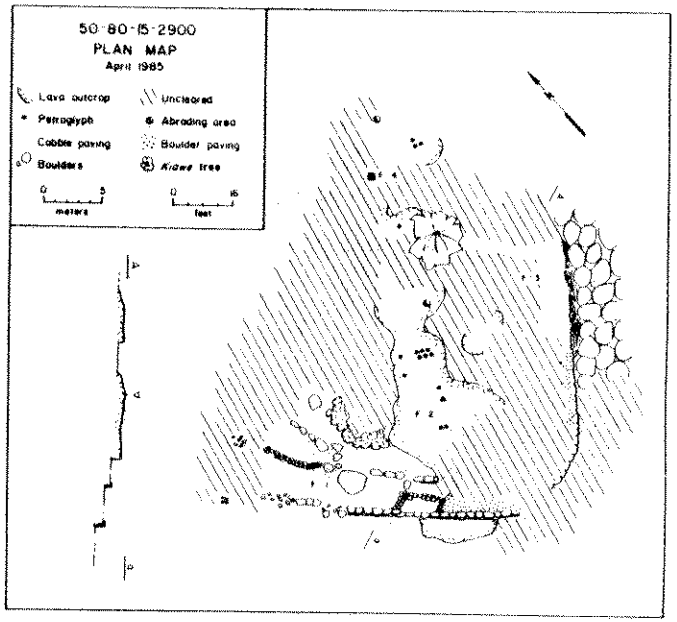

Figure 4.

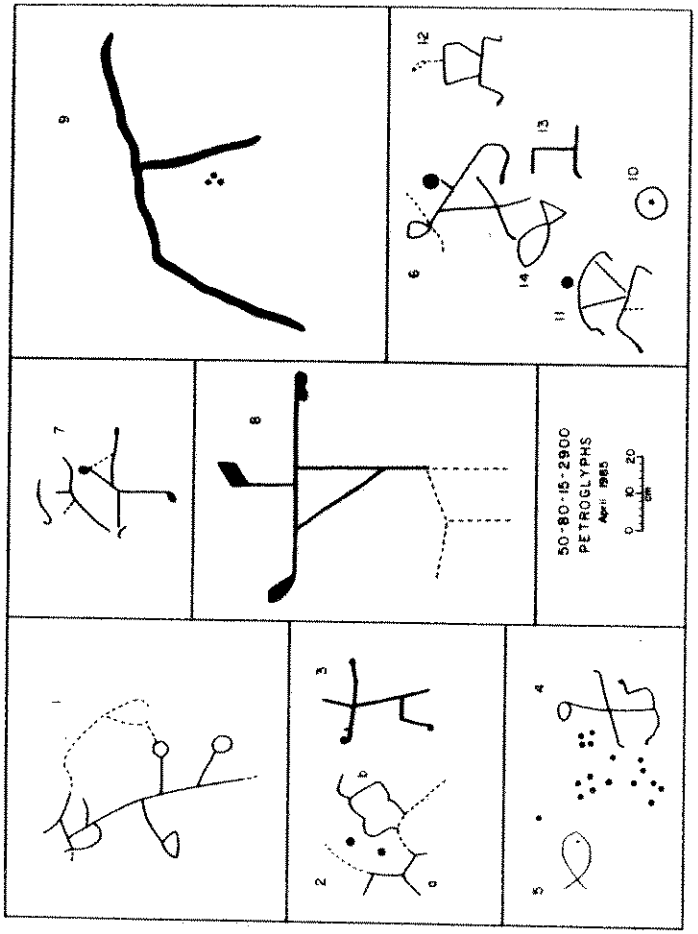

Figure 5.

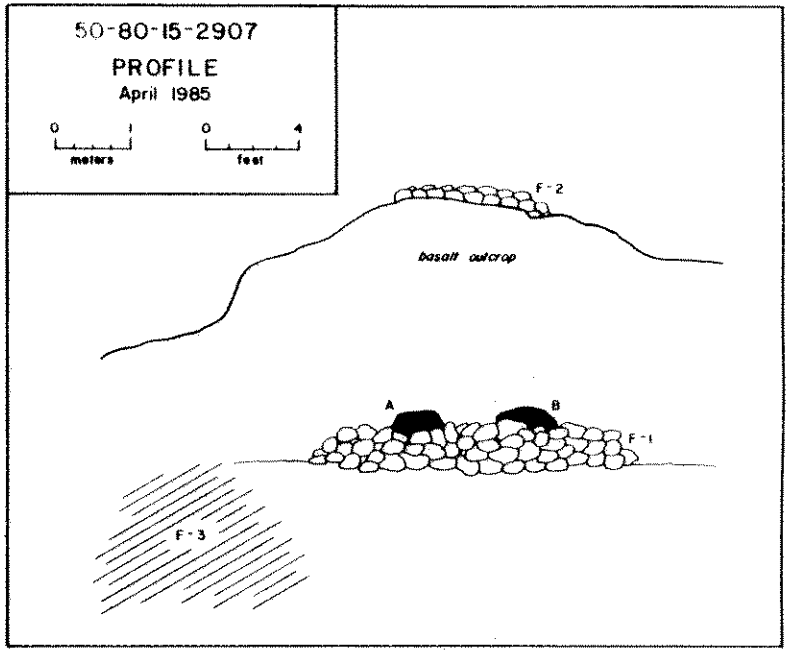

Figure 6.

Photo 1. Grass vegetation common in the survey area. [P. Price-Beggerly, standing in the center of the photo, less than 2 m (7 ft) from the camera, cannot be seen.]

Photo 2. Typical vegetation on the talus slopes of the survey area.

Photo 3. View, to southeast, of boulder field/ stockpile abutting Site 50-80-15-2900.

Photo 4. View of Site 50-80-15-2900 Feature I, to east along A-a cross-section shown on Figure 4. Lower terrace wall is in foreground.

Photo 5. View of Site 50-80-15-2900 Feature 1. Showing northwest end of upper terrace wall.

Photo 6. View of curve in Site 50-80-15-2900 retaining wall.

Photo 7. Site 50-80-15-2900 Feature 2. Petroglyph 4 is to the right of Petroglyph 5, emphasized with chalk. Tape is extended 50 cm (20 in).

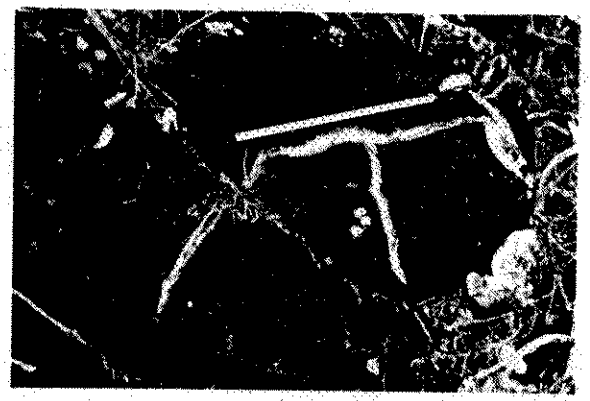

Photo 8. Site 50-80-15-2900 Feature 2. Showing Petroglyph 9, chalked for emphasis. Tape is extended 50 cm (20 in).

Photo 9. Site 50-80-15-2902 showing western portion of rockshelter ledge and overhang.

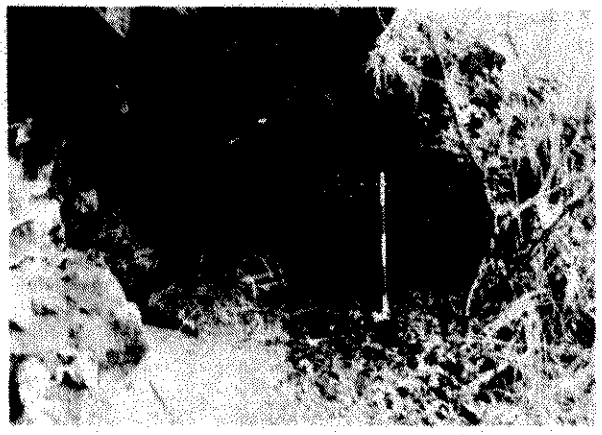

Photo 10. Site 50-80-15-2902 showing eastern portion of rockshelter ledge and overhang. Lava tube opening is in the center of the photo with lumber lying on the surface.

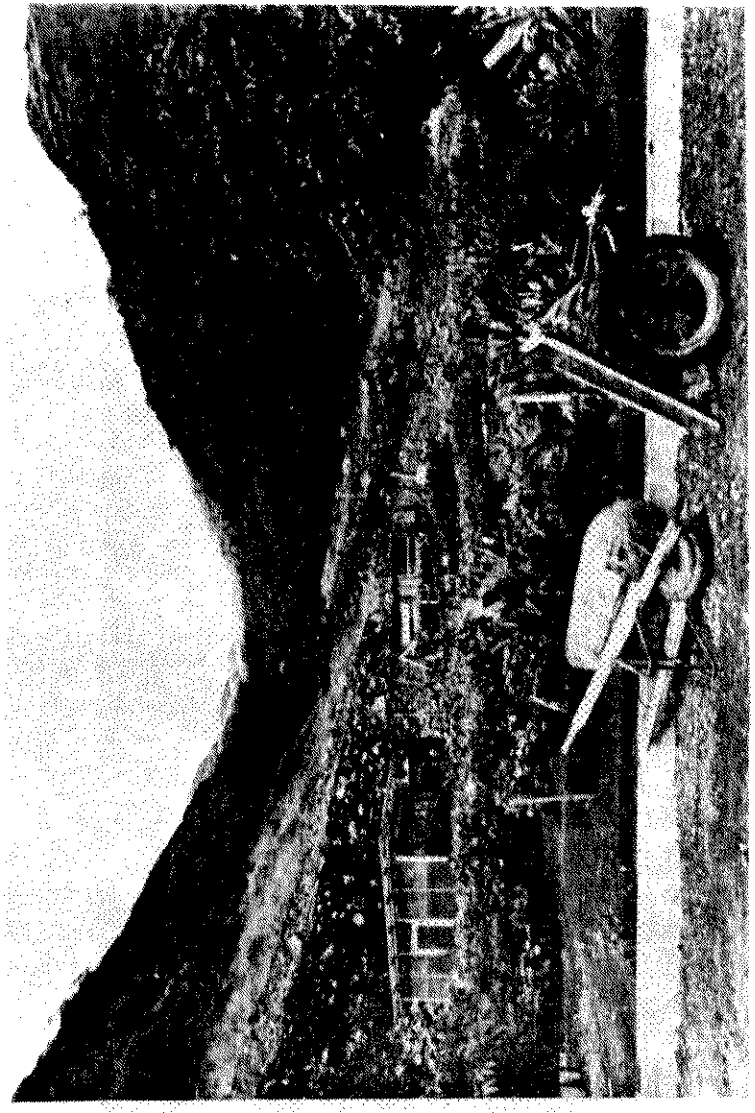

Photo 11. View of Site 50-80-15-2906 taken ca. 1960 (Solheim 1965). Structures shown, although abandoned and collapsed, are still recognizable.

Photo 12. Site 50-80-15-2907 showing wall (Feature 1) which partially blocks entrance to the cave openings; "A" on the left, "B" on the right.

Photo 13. Site 50-80-15-2907. View toward the west showing Feature 3 platform in the center and Feature 1 on the right.

Photo 14. View of Field No. E showing setting. Cavity opening is at base of meter stick (20 cm increments).

Photo 15. Close-up view of Field No. E. Meter stick position is unchanged from Photo 14.

APPENDIX C

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

July 19, 1985

TO: JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR HAWAII KAI MARINA ZONING PROJECT, TMK: 3-9-08:13, 16 AND TMK: 3-9-09:13

We have no objections to the proposed project. We also have no additional comments to those in our letter in Section X of the environmental document.

If you have any questions, please contact Lawrence Whang at 527-6138.

For KAZU HAYASHIDA
Manager and Chief Engineer

cc: Mr. F. J. Rodriguez

NO RESPONSE NEEDED

JUL 24 1985

PB 85-656

July 15, 1985

TO: MR. JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: HERBERT K. MURAOKA
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
HAWAII KAI MARINE ZONING

We have reviewed the draft Environmental Impact Statement for Hawaii Kai Marine Zoning and have no comments.

Thank you for the opportunity to review the draft EIS.

HERBERT K. MURAOKA
Director and Building Superintendent

TH:ft
cc: Environmental Communications, Inc.
J. Harada

NO RESPONSE NEEDED

7-15-85

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

FRANK F. FASI
MAYOR

ALVIN K.H. PANG
DIRECTOR

August 7, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: Chapter 343, Hawaii Revised Statutes
Environmental Impact Statement
Project: Marina Zoning, Hawaii Kai, Oahu
TMK: 3-9-08: Various Parcels
Area: 97± Acres
Existing Land Use: Vacant Land
Development Plans: Low and Medium Density Apartments
Proposal: Rezoning proposal for approximately 97± acres with approximately 2,400 residential units to be constructed over a period of seven years. Current Development Plan designates subject parcels (7) as either low or medium density apartment use. Rezoning request from existing R-6, P-1 and AG-1 to A-1 and A-2 apartment use. Developer (Kaiser) intends to build market quality apartment housing units.

Thank you for the opportunity to review and comment on the Environmental Impact Statement for the Marina project at Hawaii Kai, Oahu.

We have no objection at this time to the project. We are pleased to know that the developer has begun and will continue to work with our Housing Division to develop a affordable housing program in connection with the rezoning application.

As a reminder, any questions may be directed to Mr. James Miyagi of our Housing Division at 523-4264.

Sincerely,

ALVIN K. H. PANG

AUG 9 1985

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

August 26, 1985

Mr. Alvin K.H. Pang, Director
Department of Housing and
Community Development
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Pang:

We are in receipt of your department's comments dated August 7, 1985 on the proposed Marina Zoning, Hawaii Kai, Oahu. We respond as follows:

The availability of affordable housing units to comply with your department's program will be negotiated during the review and processing of the project's zoning application. Please be assured that the applicant will comply in a satisfactory manner to your department's requirements.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

FJR:la

1148 FORT STREET MALL SUITE 200 • P. O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE 808-521-6391

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

DONALD A. CLEGG
CHIEF PLANNING OFFICER

GENE CONNELL
DEPUTY CHIEF PLANNING OFFICER

VW/DGP 7/85-1885

July 29, 1985

MEMORANDUM

TO: Mr. John P. Whalen, Director
Department of Land Utilization

SUBJECT: Draft Environmental Impact Statement (EIS),
Hawaii Kai Marina Zoning

We have reviewed the subject Draft EIS and comment as follows:

Item II.B. Project Description

The EIS states that a total of 2,400 apartment units will be constructed over a period of 6 to 7 years with an estimated population of 5,270; 470 units will be low density units and 1,930 will be medium density units. Our population studies indicate that low density apartments in Hawaii Kai average 3 persons/unit and medium density apartments average 2 persons/unit. Thus, the EIS population estimate is verified by DGP analysis.

Item III.J.4. Recreational Facilities (also Table 6)

The EIS states that "Hawaii Kai has an abundance of public and private recreational facilities either in or abutting the community." We agree that Hawaii Kai has fine recreational facilities; however, there is no mention in the EIS of the 5-acre neighborhood park located mauka of Hawaii Kai Drive adjacent to the Hawaii Kai Recreation Center which the developer agreed to improve and dedicate to the City and County of Honolulu as a part of the agreement to change the Hawaii Kai DP Land Use Map designation during the 1984-85 Annual Review program. We strongly believe that the addition of 2,400 housing units with a population of 5,270 people located in and near the Hawaii Kai Town Center will require a new neighborhood park

of at least 5 acres with both passive and active recreational facilities. We also call attention to the fact that the nearest neighborhood park to the Town Center is Hahaione Neighborhood Park which is located over a mile from the Town Center--beyond the acceptable walking distance of Town Center residents. The Town Center Neighborhood Park is also designed to provide some service to residents of Mariners Ridge which have no neighborhood recreational facility.

In summary, we strongly recommend that the agreed upon 5-acre neighborhood park on the Town Center adjacent to the Hawaii Kai Recreational Center be specifically designated and described in the Final EIS.

Item IV.E. Impact on Traffic Conditions (also Appendix C, Transportation Management Study, Wilbur Smith and Associates, April 21, 1985)

In our June 7, 1985 comments to Environmental Communications, Inc., upon the EIS Preparation Notice, Kaiser Development Company, Marina Zoning, Hawaii Kai, we recommended that further analysis be included in the EIS concerning traffic generation on Kalanianaole Highway. We find that the EIS contains some, but not all, of the recommended data. The consultant, Wilbur Smith and Associates, provides analysis that the increases in Hawaii Kai traffic on Kalanianaole Highway due to the proposed Marina Zoning are 460 auto trips toward Honolulu during the morning peak hour and 340 auto trips toward Hawaii Kai during the evening peak hour. Presently zoned lands in Hawaii Kai would add 430 auto trips to the morning peak hour and 370 auto trips to the evening peak hour. However, the rideshare measures recommended under the consultant's transportation management study (free bus passes, park-and-ride, vanpools, express club bus, express bus, bicycle facilities and a transportation manager) are estimated to reduce auto trips by Hawaii Kai residents 360 in the morning peak hour and 280 in the evening peak hour. The consultant then analyzes both the morning peak bottleneck (Kalaniiki Street and Kalanianaole Highway) and the evening bottleneck (East Halemaumau Street and Kalanianaole Highway) and concludes that both the Marina Zoning and existing zoning traffic can be accommodated within the capacity of these intersections when roadway modifications and increased high occupancy vehicle (HOV) use are included with the ridesharing measures.

In Appendix C (Transportation Management Study, Wilbur Smith and Associates, April 21, 1985) the EIS presents recommendations for a series of roadway and operational modifications. These recommended modifications appear to be conceived without consideration for the impact on the affected residents in the immediate area. For example, one of these "improvements" to Kalanianaole Highway traffic is to "(p)ermit left turns from Waikui Street during the morning peak period." The idea is to divert a portion of the Waieli Street traffic to Waikui Street to reduce signal time for through traffic on Waiele Street. However, Waikui Street is a narrow residential street approximately 1,200-foot long which parallels Kamehameha Highway. Allowing left turns at the Waikui and Kalanianaole Highway intersection during the peak period will attract many drivers from Kalanianaole Highway hoping to bypass a three-block traffic jam; this will create a morning back-up of traffic along Waikui Street making it very difficult for residents of Waikui Street to gain access to the street they live on. We request that in the Final EIS, the series of recommendations of roadway and operational modifications be reexamined to evaluate adverse impacts on residents of the immediately adjacent areas instead of only the traffic engineering considerations to move more vehicles/hour on Kalanianaole Highway.

We requested quantification in the EIS of the impacts of the 2,400 additional housing units on Kalanianaole Highway during both the morning and evening peak traffic in terms of four variables: (1) travel time from Hawaii Kai to Downtown Honolulu, (2) total cost/day for vehicle operations and driving time, (3) air pollution, and (4) noise. The consultant provides no data on increases in travel time, total costs/day, and the impact of increased traffic on air pollution. However, the Draft EIS states that noise level increases attributable to the Marina Zoning "by 1994 were calculated to be less than 1 dB along Kalanianaole Highway." We request that the final EIS provide the missing data concerning the impact of the added 2,400 housing units on Kalanianaole Highway:

1. Estimated increases in travel time from Hawaii Kai to Downtown Honolulu during the morning peak hour traffic.

2. Estimated increases in travel time from Downtown Honolulu to Hawaii Kai during the evening peak hour traffic.

3. Estimated total increase in costs/day for vehicle operation and driving time.

4. Estimated increase in air pollution during morning and evening peak traffic hours due to additional autos from: (a) Hawaii Kai Marina Zoning, and (b) development of presently zoned lands in Hawaii Kai.

With regard to noise impact, we request that specific data be provided on noise mitigation measures to be applied to each of the 60 housing units that are identified as being impacted by an excess of 65 Ldn in Section IV, Draft EIS (pp IV-23).

Omitted Item: Affordable Housing in the Marina Zoning Development

In our review of the EIS Preparation Notice, we commented upon the lack of any discussion of the issue of affordable housing. We then recommended that the following data be included in the EIS concerning the 10% affordable housing commitment of the developer: (1) Where will these 240 housing units be located? (2) What price range is planned for these affordable units? (Specifically the number of units at each price level.)

We find no data in the subject Draft EIS concerning affordable housing in the Marina Zoning development; therefore, we repeat our recommendation that this issue be addressed in the Final EIS in the detail specified above.

Thank you for this opportunity to review the Draft EIS and offer our comments and recommendations for improvements to the Final EIS.

Donald Clegg

DONALD A. CLEGG
Chief Planning Officer

cc: Kaiser Development Company
Environmental Communications, Inc.

F. J. RODRIGUEZ
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Mr. Donald A. Clegg
Chief Planning Officer
Department of General Planning
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

We are in receipt of your department's comments dated July 29, 1985 on the proposed Marina Zoning project at Hawaii Kai. We respond in the following:

1. Item II.B. Project Description - No response required

2. Item III.J.4. Recreational Facilities - The applicant has discussed this matter of Park Dedication Ordinance compliance with the Department of Parks & Recreation staff. At the present time, various options are being explored with the Parks Department for their review and approval. These options include locating YMCA facilities at the proposed parkride site and developing soccer fields at Koko Head District Park, among other possibilities. In view of these ongoing negotiations, we are requesting that your Department defer to the Parks Department on this matter for final resolution. Please be assured that there will be compliance with the Park Dedication Ordinance and that during the Zoning Application process, the compliance will be resolved to the satisfaction of the Parks Department.

3. Item IV.E. Impact on Traffic Conditions - The specific items listed in this comment were referred to Wilbur Smith & Associates, Y. Ebisu & Associates, and Barry D. Root for their review and response. We are providing the consultants' responses for your review on this section.

4. Omitted Item: Affordable Housing in the Marina Zoning Development - This item has also been the subject of meetings and discussions with the Department of Housing & Community Development. The Director, Mr. Alvin Pang indicated in his comments dated August 7, 1985 that "they have no objections to the proposed project and understand that the development of an affordable housing program will be done in connection with the zoning application."

We hope that these responses are adequate for the purposes of the Draft EIS; thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls
Attachments

1149 FORT STREET MALL SUITE 200 • P.O. BOX 536 • HONOLULU HAWAII 96809 • TELEPHONE 808 521 8361

Y. Ebisu & Associates
Acoustical and Electronic Engineers
1126 12th Avenue
Room 305
Honolulu, Hawaii 96816
(808) 735-1634

YEA JOB #23.003
August 2, 1985

Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

Attention: Mr. Fred Rodrigues

Subject: Department of General Planning Critique Letter dtd. 7/29/85; Kaiser Marina Zoning Project.

Dear Fred:

If I read the DGP letter correctly, they are not asking for any other noise information along Kalanianaole Highway. However, they do want to know beforehand what noise mitigation measures will be applied to those homes within the 65 Ldn contours. I can't speak for Kaiser, but if they go for FHA/HUD approvals, the following would probably occur to mitigate the noise impacts:

a. An updated noise study, with measured traffic noise data, would probably be conducted to refine the results of the EIS.

b. Based upon the results of this updated study, HUD will require noise mitigation measures to be incorporated into the construction plans for all homes within the updated 65 Ldn contours.

c. I do not know what options are available to the developer, but based on other similar projects which I have done, mitigation measures such as increasing the building setback, constructing sound attenuation walls for first floor dwellings, and installing window sound attenuators would be the primary measures employed.

Sincerely,

Yoichi Ebisu, P.E.

AUG 7 1985

Barry D. Root Air pollution consultant

~~1087 B Young Street Honolulu Hawaii 96814 808 531-6006~~
46-198 LILIPUNA ROAD, KANEOHE, HAWAII 96744 247-6827

AUGUST 7, 1985

TO: ENVIRONMENTAL COMMUNICATIONS, INC.

FROM: BARRY D. ROOT, AIR POLLUTION CONSULTANT

SUBJECT: Response to City and County of Honolulu, Department of General Planning letter dated July 29, 1985, regarding Hawaii Kai Marina Zoning EIS

Among other things, the above letter requests that the EIS provide the estimated increase in air pollution during morning and evening peak traffic hours due to additional autos from: (a) Hawaii Kai Marina Zoning, and (b) development of presently zoned lands in Hawaii Kai.

Part (a) of the request is clearly shown in Table 2 of the Air Quality Study for the project. The answer to part (b) is beyond the scope of the original study. However, the contribution of traffic from previously zoned lands in Hawaii Kai to peak hour air pollution levels is included in total levels shown in Table 2 without the Marina Zoning traffic. A review of the modeling inputs indicates that the average increase in traffic volume per lane generated by the previously zoned Hawaii Kai lands would be about eight percent of the total traffic before inclusion of that from the Marina Zoning lands. Applying this percentage to the level of carbon monoxide estimated for morning peak hour worst case conditions yields about 0.9 milligrams per cubic meter attributable to traffic increases from previously zoned Hawaii Kai lands in 1994 and about 0.8 milligrams per cubic meter in 2004. For the evening rush hour, similarly derived values would be about 0.4 and 0.3 milligrams per cubic meter for 1994 and 2004 respectively.

AUG 9 1985

Wilbur Smith and Associates, Inc.

282 SECOND STREET
2ND FLOOR
SAN FRANCISCO, CA. 94105-3189
PHONE (415) 896-0670

CABLE WILSMITH
TELEX 57-343

August 7, 1985

Mr. Stanley Fujimoto
Kaiser Development Company
7120 Kalanianaole Highway
P.O. Box 25007
Honolulu, Hawaii 96825

Subject: Response to Comments on Hawaii Kai Marina Zoning Draft Environmental Impact Statement (EIS)

Dear Mr. Fujimoto:

I have reviewed the Department of General Planning (DGP) comments on the Draft EIS relative to the analysis of traffic impacts. I offer the following responses and information.

Waikui Street Impacts

The DGP requests that the EIS address the impacts on the Waikui Street residences that would result from permitting left-turns from Waikui Street onto Kalanianaole Highway. DGP suggests that allowing the left-turn may result in use of Waikui Street by Kalanianaole Highway traffic to bypass the three-block traffic jam on Kalanianaole Highway.

First, during the morning peak traffic period, Waikui Street is currently used as a "jug handle" route for outbound (Koko Head direction) traffic turning left to Kalaniiki Street. Approximately 150 vehicles currently turn right onto Waikui Street from Kalanianaole Highway during the morning peak hour and use Waikui Street for this purpose, with most of the vehicles destined to Kalani High School. Permitting a left-turn from Waikui Street is expected to attract 30 to 50 left-turn vehicles out of the 125 vehicles that currently turn left at Waikui Street during the morning peak hour. This increase of 1 car every 1 to 2 minutes in the Ewa direction should not significantly affect residents along Waikui Street.

Secondly, it is highly unlikely that any inbound Kalanianaole Highway motorists would use Waikui Street to bypass the congestion at Kalaniiki Street. The Laukahi-Waiholo Street intersection provides the only location from which inbound motorists can turn to reach Waikui Street. Once drivers have reached Laukani Street, they would expect to travel through the Kalaniiki intersection "bottleneck" on the next signal cycle and without any further stops. Thus, they would reach the H-1 Freeway within ½ to 2 minutes once they arrive at Laukahi Street.

In order to use Waieli Street as a bypass, inbound drivers would have to travel a much longer, more circuitous route. Left-turns are prohibited from Kalanianaole Highway onto Waiholo Street. Thus, the "bypass" motorists would turn right onto

Laukahi Street, then make a "U" turn at the rear of the long traffic queue on Laukahi Street. The Laukahi Street traffic signal cycle is approximately 2½ minutes with 15 to 30 seconds green time for Laukahi Street. Thus the "bypass" motorist would likely experience a lengthy wait to cross Kalanianaole Highway to Waiholo Street. Once on Waiholo Street, the motorist would travel six blocks through the subdivision to reach the Waikui Street traffic signal. This signal would provide only 10 to 15 seconds green time to Waieli Street every 2½ minutes, thus necessitating another wait.

In summary, motorists approaching Laukahi Street may expect to reach H-1 Freeway in ½ to 2 minutes by continuing on Kalanianaole Highway versus a minimum 4 to 5 minutes, or more, via the Waiholo-Waieli-Waikui Street route. Thus, aside from an accident or some other blockage of Kalanianaole Highway, inbound traffic would be unlikely to use this route as a bypass.

Travel Time Impacts and Costs

The DGP requested that impacts be estimated for the following travel factors:

1. Morning peak hour travel time from Hawaii Kai to Downtown Honolulu.

2. Evening peak hour travel time from Downtown Honolulu to Hawaii Kai.

3. Estimated increases in costs per day for vehicle operation and driving time.

Peak Hour Travel Time Impacts - We have analyzed the travel time impacts for items 1 and 2 above, however, the analysis was limited to the impacts on Kalanianaole Highway between Hawaii Kai and Ainakoa Avenue. Our analysis was limited to this section for several reasons:

1. Travel conditions ewa of Kalanianaole Highway will be affected by new development projects throughout the central Honolulu area (Waikiki, Kakaako, Makiki, etc.) as well as traffic increases in the Pali Highway corridor. There is insufficient information available relative to new development over the next 10 years to permit a meaningful travel time analysis ewa of Kalanianaole Highway.

2. Increases in Hawaii Kai traffic from the Marina Zoning projects would likely have only a nominal affect on travel times ewa of Kalanianaole Highway relative to the impacts of new development elsewhere in the central Honolulu area.

3. We do not have the necessary travel time and traffic volume information necessary to permit analysis between the Waialae area and Downtown

Our travel time impact analysis was conducted using the EZ-POSIT microcomputer analyses program, which analyzes traffic impacts on operations and conditions at traffic signal-controlled intersections. This approach was used since virtually all of the travel time impacts along Kalanianaole Highway will result from increased queuing and delays at the six key signalized intersections.

Therefore, the analysis was performed for 1984 and forecast 1994 traffic volumes and capacities at the Ainakoa, Kalaniiki, Laukahi, West Hind, East Halemaumau, and Kuliouou/Elelupe intersections. The program was permitted to use the optimum signal timing for both years since the difference in travel times rather than the total travel time is the desired product.

The analysis indicates the following impacts on the average travel time between Hawaii Kai and Ainakoa Avenue:

	Current Travel Time (1) (Minutes)	Increase from all New Development (Minutes)	Increase from Marina Zoning (Minutes)
Morning Peak Hour	14-22	.01	Nominal
Evening Peak Hour	15-18	.25	.10

During the morning, the proposed mitigation measures would reduce traffic or increase capacity sufficiently at the Kalaniiki "bottleneck" to offset the new development traffic. Therefore, the traffic will be able to travel through the bottleneck area in approximately the same time as today. The upstream (more easterly) intersections would experience slight increases in delay, however, this only transfers the location of a portion of the delay time from the Kalaniiki Street intersection to the upstream intersections and does not increase the total corridor delay and travel time.

---

(1) Source: "A Study of Technical Aspects in Using Highway Corridor Impacts to Constrain Residential Development on Oahu — Draft," prepared for City and County of Honolulu Department of General Planning by Darby and Associates, 1985.

During the evening, increased delays at the East Halemaumau intersection would contribute about 40 percent of the travel time increase with the remainder spread among the other intersections.

Increase in Costs - The travel time analysis indicates that the Marina Zoning projects would likely result in only small changes in travel time and travel speeds. Small changes in travel speed cause only a very small change in unit operating costs per mile, with most of the additional costs to resulting from increased gasoline consumption due to more frequent stopping and starting, and longer periods of idling.

Previous references[2] on the value of travel time suggest that small changes (increase or decrease) in travel time (under 5 minutes) have little value to the motorist. The suggested 1977 values were 48 and 21 cents per hour for work and nonwork trips, respectively.

For this analysis of Kalanianaole Highway trips, we have used the following assumptions:

- A time value of $10 per hour per adult in the vehicles. This reflects the approximate average wage rate for East Honolulu residents (in 1980), and implies that all trips are valued as work trips.
- An occupancy of 1.2 adults per vehicle; children are not included in the analysis.
- An average gasoline cost of $1.50 per gallon.

The cost analyses was limited to the peak hour periods since these would represent the major portion of any increase in delays, and due to the insuficiency of data needed to evaluate other hours. The average cost per peak hour vehicle trip was estimated using the above assumptions and the EZ-POSIT analysis of travel times, delay times, number of stops, and full consumption.

The average increase in peak hour travel costs per one-way trip for Kalanianaole Highway drivers is estimated as follows:

(2) Manual on User Benefit Analysis of Highway and Bus Transit Improvements, American Association of State Highway and Transportation Officials (AASHTO), 1977.

	Morning	Evening
Time Costs	$0.03	$0.08
Vehicle Operating Costs	0.003	0.01
Combined Increase Per Trip	$0.033	$0.09

Note that these costs include not only the costs from increased stops and delays on Kalanianaole Highway, but also includes the increase in costs to vehicles on cross-streets waiting to enter the highway. Approximately 40 percent of the increase would be attributed to Marina Zoning impacts and the balance as a result of other traffic increases.

* * *

Please contact me if you require any further information of have questions concerning the analysis methology or findings.

Sincerely,

WILBUR SMITH AND ASSOCIATES

Bryant T. Brothers
Associate

BTB:tft
019

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 ☎ (808) 523-4432

FRANK F. FASI
MAYOR

JOHN P. WHALEN
DIRECTOR

(EKM)

August 22, 1985

Mr. Fred Rodriguez
Environmental Communications
P.O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez

Chapter 343, HRS
Draft Environmental Impact Statement
Marina Lands Development at Hawaii Kai, Oahu
Tax Map Key 3-9-03: 13, 16 and 3-9-09: Portion 13

We have reviewed the above Draft EIS and offer the following comments:

1. Ridesharing Measures: The transportation management study estimates mitigation of traffic impacts based upon commuter participation in a variety of ridesharing alternatives. Anticipated participation in these alternatives is based on data from other communities. There is no indication, however, that these areas have as diverse a program of ridesharing as proposed for the project. Since Hawaii Kai already has a relatively high rate of mass transit use, additional programs could yield diminishing rates of participation. Therefore, the limitations of using data from other communities for the proposed ridesharing program in Hawaii Kai should be thoroughly discussed.

2. Alternatives to the Proposed Action: In view of the potentially significant adverse impact the project may have on traffic, the EIS should discuss project alternatives that could mitigate this concern. For example, the project could be phased with implementation of each subsequent phase contingent upon the successful mitigation of traffic impacts resulting from the preceding phase.

AUG 23 1985

If there area any questions regarding these comments, please contact Mr. Earl Matsukawa of our staff at 527-5038.

Very Truly Yours,

John P. Whalen

JOHN P. WHALEN
Director of Land Utilization

JPW:sl

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ,
PRESIDENT

August 26, 1985

Mr. John P. Whalen, Director
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

We are in receipt of your department's comments dated August 22, 1985 on the draft EIS for the proposed Marina Zoning. We respond in the following:

1. Ridesharing Measures: The question as to the limitations of using data from other communities for the proposed ridesharing program in Hawaii Kai has been provided to the retained Traffic Consultant who prepared the overall study. Their response states the following:

   a) "Our rideshare program recognizes and takes into account the experience of developers and employers elsewhere who have implemented a similar comprehensive program and have found that it does become more difficult to attract additional incremental increases in program participation. Our estimates of the usage and effectiveness of the rideshare measures reflect this in two ways:

      - For each individual rideshare measure, the resident participation rates reflect low to average success levels found in other programs. We have used the lowest rates where competition is likely between two rideshare measures to serve commuters to the same destination.

      - Commuter "crossover" between rideshare modes/programs has been accounted for in the estimated reduction in automobile use. The estimates reflect 42 percent of the program participation will be drawn from existing bus service, or "competing" rideshare."

2. The development of the Marina Zoning parcels will be phased in a period of approximately seven years, depending on market acceptance, absorption rates, and other considerations.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1136 FORT STREET MALL, SUITE 250 • P. O. BOX 538 • HONOLULU, HAWAII 96809 • TELEPHONE 808-521-5361

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

TOM T. NEKOTA
DIRECTOR

July 16, 1985

TO: JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: TOM T. NEKOTA

SUBJECT: DRAFT EIS FOR HAWAII KAI MARINA ZONING
TMK: 3-9-08 and 3-9-09

We have reviewed the Draft EIS for the Hawaii Kai Marina Zoning and make the following comments and recommendation.

The Draft EIS has not addressed the recreational impact that the proposed zoning would have on our public park system in Hawaii Kai. We are especially concerned because the areas considered for rezoning would result in a high density of housing units in a close proximity.

Furthermore, the report has not responded to the matter of how compliance with the City's Park Dedication Ordinance No. 4621 would be accomplished.

The applicant should contact our Department to discuss the recreational impact and park dedication requirements of their zoning project.

Should you have any questions, please contact Mr. Jason Yuen at extension 4884.

Tom T. Nekota

TOM T. NEKOTA, Director

TTN:as

cc: Mr. F. J. Rodriguez
Environmental Communications, Inc.

7-19-85

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Mr. Tom T. Nekota, Director
Department of Parks & Recreation
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Nekota:

We are in receipt of your department's comments dated July 16, 1985 on the proposed Marina Zoning project and we respond in the following:

1. The applicant has indicated that there will be compliance with the Park Dedication Ordinance for the proposed zoning application. The details of the compliance requirement are being discussed with your staff and are scheduled to be completed in time for review during the zoning application process. Please be assured that there will be compliance and that adequate recreational facilities will be designed, developed, and located in accordance with your department's requirements.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:la

1146 FORT STREET MALL SUITE 200 • P.O. BOX 5380 • HONOLULU, HAWAII 96808 • TELEPHONE 521-5337

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RUSSELL L. SMITH, JR.
DIRECTOR AND CHIEF ENGINEER

ENV 85-188

July 22, 1985

MEMORANDUM

TO: MR. JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: RUSSELL L. SMITH, JR., DIRECTOR AND CHIEF ENGINEER

SUBJECT: DRAFT EIS FOR THE HAWAII KAI MARINA ZONING
HONOLULU, OAHU, HAWAII

We have reviewed the subject EIS and have the following comments.

A National Pollutant Discharge Elimination System (NPDES) permit may be required for stormwater point discharges for existing and new storm drain outlets. The necessary permit requirements should be provided by the applicant should the system be dedicated to the City.

RUSSELL L. SMITH, JR.
Director and Chief Engineer

cc: Environmental Communications, Inc.

JUL 23 1985

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

August 26, 1985

Mr. Russell L. Smith, Jr.
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Smith:

We are in receipt of your department's comments dated July 22, 1985 on the proposed Marina Zoning project. We respond in the following:

It has not been determined if there is a need to develop additional stormwater or drainage discharge capacity to accomodate the proposed project. In the event that this becomes necessary and the added facilities are dedicated to the City, the NPDES permit requirement will be processed accordingly.

Thank you for your comment and continuing concern.

Very truly yours,

F. J. Rodriguez

FJR:ls

[illegible] FORT STREET MALL, SUITE 200 • P.O. BOX 538 • HONOLULU, HAWAII 96810 • TELEPHONE 808/[illegible]

IE7/85-3045
PL 1.0027

August 2, 1985

MEMORANDUM

TO: JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: JOHN E. HIRTEN, DIRECTOR

SUBJECT: DRAFT EIS FOR HAWAII KAI MARINA ZONING
TMK: 3-9-08: POR. 13, 16
3-9-09: POR. 13

This is in response to the State Office of Environmental Quality Control's request of July 8, 1985, for comments on the subject draft EIS.

We have reviewed the draft EIS and find that the traffic impacts from the proposed zone changes have been addressed in a generally satisfactory manner.

The applicant proposes a "Recommended Transportation Program" consisting of Ridesharing and Roadway Modifications to mitigate the traffic impact emanating from their project. We believe that these measures, with some possible modifications, can be effective if implemented on a timely basis to coincide with the applicant's development schedule. However, we also feel that further detailing and evaluation is desirable to insure that the claimed capacity increases are achievable.

We also recommend that cost estimates and cost allocations to responsible parties be included in the EIS for the "Recommended Transportation Program."

If there are any questions, please contact Kenneth Hirata of my staff at local 5009.

JOHN E. HIRTEN

AUG 0 2 1985

AUG 23 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Mr. John E. Hirten, Director
Department of Transportation
Services
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Hirten:

We are in receipt of your department's comments dated August 2, 1985 on the proposed Marina Zoning project. We respond in the following:

1. The additional detailing on the mitigative measures identified as part of the "Recommended Transportation Program" should be provided by the time the Marina zoning project reaches the Planning Commission and City Council for formal public hearing. To the extent possible, the details available at this early point will be included in the Final EIS.

2. Cost estimates and cost allocations will also be provided to the extent possible in the Final EIS.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:la

1145 FORT STREET MALL SUITE 300 • P.O. BOX 2[illegible] • HONOLULU, HAWAII 96813 • TELEPHONE 5[illegible]

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

FRANK F. FASI
MAYOR

FRANK K. KAHOOHANOHANO
FIRE CHIEF

LIONEL E. CAMARA
DEPUTY FIRE CHIEF

August 22, 1985

TO : JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM : FRANK K. KAHOOHANOHANO, FIRE CHIEF

SUBJECT: REQUEST FOR ZONE CHANGE - HAWAII KAI
KAISER DEVELOPMENT COMPANY
TAX MAP KEY: 3-9-08: 16, POR. 13

We have reviewed the above proposed zone change application and have no objections, provided the fire protection facilities as described in the application are installed.

Should additional information be required, you may direct your staff to contact Captain John P. Souza of our Fire Prevention Bureau at 523-4186.

FRANK K. KAHOOHANOHANO
Fire Chief

FKK:smh

cc: R.J. Rodriguez
Environmental Communications, Inc.

NO RESPONSE NEEDED

AUG 27 1985

EPS-J6

July 17, 1985

TO: JOHN P. WHALEN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: DOUGLAS G. GIBB, CHIEF OF POLICE

SUBJECT: DRAFT EIS FOR HAWAII KAI MARINA ZONING

We have completed our review of the draft EIS for Hawaii Kai Marina Zoning submitted to us on July 8, 1985. The draft addresses the specific concerns that we had raised previously, and we find nothing in it that requires further comment at this time.

DOUGLAS G. GIBB
Chief of Police

cc: Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

NO RESPONSE NEEDED

7-19-85

GEORGE R. ARIYOSHI
GOVERNOR

JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE

SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96822

July 25, 1985

MEMORANDUM

To: Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu

Subject: Draft Environmental Impact Statement (EIS)
for Hawaii Kai Marina Zoning
R-6, P-1 and Ag-1 to A-1 and A-2
Kaiser Development Company
Hawaii Kai, Oahu
TMK: 3-9-08: por. 13, 16
3-9-09: por. 13
Acres: 97

The Department of Agriculture has reviewed the subject Draft EIS and does not have any comments to offer.

Thank you for the opportunity to comment.

Jack K. Suwa
JACK K. SUWA
Chairman, Board of Agriculture

cc: Environmental Communications, Inc.

NO RESPONSE NEEDED

"Support Hawaiian Agricultural Products"

JUL 29 1985

(P)1383.5

Mr. John P. Whalen
Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: Draft EIS for Hawaii Kai Marina Zoning

We have reviewed the subject document and have no comments to offer.

Very truly yours,

T. Tominaga
TEUANE TOMINAGA
State Public Works Engineer

CT:jk
cc: Mr. F. J. Rodriguez

NO RESPONSE NEEDED

JUL 24 1985

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

ALEXIS T. LUM
MAJOR GENERAL
ADJUTANT GENERAL

DANIEL K. C. AU
COLONEL
DEPUTY ADJUTANT GENERAL

HIENG

JUL 17 1985

Mr. John P. Whalen, Director
Dept. of Land Utilization, C&C Hnl.
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Draft EIS for Hawaii Kai Marina Zoning
Hawaii Kai, Honolulu District, Oahu

Thank you for providing us the opportunity to review the above subject development.

We have completed our review and have no comments to offer at this time.

Yours truly,

Jerry M. Matsuda

Jerry M. Matsuda
Major, Hawaii Air
National Guard
Contr & Engr Officer

Enclosure

cc: Environmental Communications, Inc.

NO RESPONSE NEEDED

7-15-85

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

CHARLES G. CLARK
DIRECTOR OF HEALTH

In reply, please refer to:
EPHSD-

August 5, 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City & County of Honolulu
650 S. King St.
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: Draft Supplemental EIS and Request for Zone Change - Hawaii Kai Marina

Thank you for allowing us to review the subject material. We provide the following comments:

Drinking Water

The Drinking Water Program commented on the EIS Preparation Notice for this project and indicated the potential for cross-connections between potable and nonpotable water lines. We have no additional comments at this time.

Noise

1. Through facility design, noise from any equipment such as air conditioning/ventilation units, heat pumps, and water pumps must be attenuated to meet the allowable levels of Title II, Administrative Rules Chapter 43, Community Noise Control for Oahu.

2. Proposed structure and surface parking must be designed to control noise, specifically towards tire squeals and vehicular emissions.

3. The proposed ride-sharing program must consider measures that would minimize the impact of noise emanating from bus stops, pick-up areas, parking and shelter sites.

4. Activities associated with the construction phase must comply with the provisions of Title II, Administrative Rules Chapter 43.

   a. A noise permit must be obtained if the noise levels from the construction activities are expected to exceed the allowable noise levels of the regulations.

   b. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must have a muffler.

AUG 8 1985

   c. The contractor must comply with the conditional use of the permit as specified in the regulations and conditions issued with the permit.

5. Traffic noise from heavy vehicles travelling to and from the construction site must be minimized near existing commercial and residential areas, and must comply with the provisions of Title II, Administrative Rules Chapter 42, Vehicular Noise Control for Oahu.

MELVIN K. KOIZUMI

cc: Mr. F. J. Rodriguez

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

August 26, 1985

Mr. Melvin K. Koizumi
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

We are in receipt of your department's comments dated August 5, 1985 and we respond as follows:

1. Drinking Water - No further comment required.

2. Noise - All applicable compliance requirements for Title 11, Chapter 42 and 43 will be achieved either by the applicant in the design standards for the proposed structural improvements, or by the general contractor responsible for the construction. Review of final building plans submitted for permits will provide final inspection of the compliance criteria.

Thank you for your comments and continuing interest.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:la

1148 FORT STREET MALL SUITE 200 • P. O. BOX 238 • HONOLULU, HAWAII 96809 • TELEPHONE 536-3727

July 31, 1985

Your: 85/Z-8(CC)

Honorable John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 So. King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Thank you for the opportunity to comment on the proposed rezoning of the 97 acres at Hawaii Kai from residential and agricultural uses to medium density apartments.

Because the 97 acres are in the Honolulu Groundwater Control Area, permits from this department are required if the project entails development of groundwater.

Sincerely,

Susumu Ono

SUSUMU ONO
Chairperson

cc: Environmental Communications

AUG 2 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Mr. Susumu Ono, Chairperson
Department of Land and Natural
Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Ono:

We are in receipt of your Department's comments dated July 31, 1985 and we respond in the following:

Appropriate permit requests will be filed with your agency in the event that source development of groundwater becomes necessary for this project's development. We are in contact with the Board of Water Supply who has indicated that availability of water will be determined at the time of building permit submittal.

Thank you for your continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:la

1146 FORT STREET MALL, SUITE 200 • P. O. BOX 538 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 521-6361

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

KAMAMALU BUILDING 250 SOUTH KING ST. HONOLULU HAWAII
MAILING ADDRESS P.O. BOX 2359 HONOLULU HAWAII 96804 • TELEX 7430250 HIDPED

GEORGE R. ARIYOSHI
GOVERNOR
KENT M. KEITH
DIRECTOR
MURRAY E. TOWILL
DEPUTY DIRECTOR
LINDA KAPUNIAI ROSEHILL
DEPUTY DIRECTOR

DIVISIONS
BUSINESS AND INDUSTRY DEVELOPMENT DIVISION
ENERGY DIVISION
FOREIGN TRADE ZONE DIVISION
LAND USE DIVISION
PLANNING DIVISION
RESEARCH AND ECONOMIC ANALYSIS DIVISION

OFFICES
DIRECTOR'S OFFICE
ADMINISTRATIVE SERVICES OFFICE
INFORMATION OFFICE

Ref. No. I-2150

August 1, 1985

The Honorable John Whalen
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: DEIS for Hawaii Kai Marina Dredging, Hawaii Kai, Oahu

We have reviewed the subject draft environmental impact statement (DEIS) and have the following comment.

The DEIS does not address the proposed project's relationship with the Hawaii State Plan and State Functional Plans. The environmental consultant in his response letter (DEIS Section A - Consulted Parties) to us indicated that this relationship would be discussed in the DEIS. We request that the Final EIS discuss this relationship.

Thank you for the opportunity to review and comment on the subject document.

Very truly yours,

Murray E. Towill

for Kent M. Keith

cc: Mr. F. J. Rodriguez
Environmental Communications, Inc.

Office of Environmental Quality Control

AUG 6 1985

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ
PRESIDENT

August 26, 1985

Mr. Kent M. Keith, Director
Department of Planning and
Economic Development
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Keith:

We are in receipt of your department's comments dated August 1, 1985 and we respond as follows:

We regret the omission of the proposed project's relationship with the Hawaii State Plan and the State Functional Plans. Please be assured that these State land use policy documents will be identified and referenced in the Final EIS.

Thank you for your concern and continuing interest.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL SUITE 200 • P. O. BOX 536 • HONOLULU HAWAII 96809 • TELEPHONE (808) 521 6261

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA STREET
ROOM 301
HONOLULU, HAWAII 96813

LETITIA N. UYEHARA
DIRECTOR

TELEPHONE NO.
548-6915

July 29, 1985

Mr. John P. Whalen, Director
Department of land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: Draft EIS for Hawaii Kai Marina Zoning, Hawaii Kai, Oahu

The proposed zoning changes will allow the construction of additional residential units which will add to the traffic on Kalanianaole Highway. The environmental impact statement indicates that by 1994 the level of service will be further degraded from an already congested condition. We suggest that any zoning change that will increase the density of Hawaii Kai consider the implementation of a mitigation measure that will improve the level of service on Kalanianaole Highway.

Sincerely,

Letitia N. Uyehara

Letitia N. Uyehara
Director

cc: F. J. Rodriguez

AUG 2 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Ms. Letitia N. Uyehara, Director
Office of Environmental Quality
Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Uyehara:

We are in receipt of your office's comments dated July 29, 1985 and we respond in the following:

The traffic consultant retained for the project, Wilbur Smith & Associates identified several mitigative measures that could be employed to reduce the potential impacts attributable to the proposed project. These mitigative measures will be reviewed by both the State Department of Transportation and also the City & County Department of Transportation Services.

Thank you for your comments.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1148 FORT STREET MALL SUITE 200 • P. O. BOX 538 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 521-8081

GEORGE R. ARIYOSHI
GOVERNOR

Letitia N. Uyehara
Director
TELEPHONE NO.
548-6915

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA STREET
ROOM 301
HONOLULU, HAWAII 96813

July 8, 1985

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 343, Hawaii Revised Statutes and the Rules and Regulations of the Environmental Quality Commission:

TITLE: Draft EIS for Hawaii Kai Marina Zoning

LOCATION: Hawaii Kai, Honolulu District, Oahu

CLASSIFICATION: Applicant Action

Your comments or acknowledgment of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Mr. John P. Whalen, Director
Dept. of Land Utilization, C&C Hnl.
650 South King Street
Honolulu, Hawaii 96813

Please send a copy of your reply to the proposing party:

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

Your comments must be received or postmarked by: August 7, 1985.

If you have no further use for this EIS, please return it to the Office of Environmental Quality Control.

July 9, 1985
No comments
Energy Division
DPED

Thank you for your participation in the EIS process.

NO RESPONSE NEEDED

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

August 22, 1985

RE:0421

Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Draft Environmental Impact Statement
Hawaii Kai Marina Zoning
Honolulu, Oahu

The above cited Draft Environmental Impact Statement has been prepared to address the potential environmental impacts associated with the development of 2400 new housing units in the marina oriented community of Hawaii Kai, Oahu. The Environmental Center review has been prepared with the assistance of Peter Flachsbart, Urban and Regional Planning; Jim Woodruff and Martha Diaz-Colon, Environmental Center. We offer the following comments for your consideration:

General Comments

The most serious issue identified by our reviewers involves the increase in traffic congestion that the proposed development will have on Kalanianaole Highway. Many of the methods suggested as mitigative measures to alleviate the traffic problems involve changes in community lifestyle, such as van pooling and expanded express bus service, or changes to the feeder roads themselves such as straightening curves or installing signals. Implementation of these mitigative measures before construction of the new housing would demonstrate their success (or need for additional methods) prior to a traffic crisis situation. We urge that implementation of these measures be considered prior to initiation of the construction.

Noise

The DEIS states: "The setbacks of the proposed Marina homes are generally adequate for the existing traffic noise levels, since the majority of the proposed homes are located outside the existing 65 L_{dn} contours" (p. III-13). The effects of traffic noise on existing homes located along the affected corridors should be discussed more thoroughly. Additional traffic from the proposed project can only make worse the problem that is already perceived by some residents as intolerable.

AUG 23 1985

Sewage Requirements

The DEIS states that planning is underway to expand the capacity of the treatment plant of East Honolulu Community Services, Inc. to accommodate the added wastewater from the ongoing and proposed projects in the area. It is our understanding that occasionally during power failures, untreated sewage has been discharged into the marina. We would recommend as part of the expansion project that standby generators be installed as an independent source of electrical power for pumping to prevent future dumping of sewage, especially in view of the large anticipated increase from the present 3.0 mgd up to 4.1 mgd (approximately 36 percent).

Waste/Waste Disposal

Although the DEIS makes reference to available infrastructure/public facilities, it does not address the impacts of increased solid wastes which will be generated and the facilities which will be needed to accommodate such increases. The existing landfills on Oahu are nearly at capacity. The FEIS should incorporate discussion on this issue as well.

Public Facilities and Services

The DEIS states that: "The nearest hospitals are the Kaiser Hospital in Waikiki and Queens Medical Center in Honolulu" (p. III-19). Plans call for Kaiser Hospital to move its location by the time this project is built and sold. The DEIS should acknowledge this move or delete reference to Kaiser Hospital. There are several other hospitals in the downtown Honolulu district, ie., Straub, Kapiolani, and Kuakini to name a few. The referenced statement in the DEIS as it presently stands is both incorrect and inaccurate.

Water

Although the DEIS cites sufficient infrastructure to accommodate the proposed development, it does not address sources or alternative sources of potable water. In light of recent/seasonal water shortages, the size and location of this proposal makes water availability a critical issue. Currently, the 8,000+ existing residential population in Hawaii Kai receive potable water from the Board of Water Supply's Honolulu and Windward sources. Furthermore, Honolulu has been designated as a groundwater control area because usage from Honolulu sources are rapidly approaching the sustainable yield of the aquifer. The FEIS should incorporate a discussion of this issue and sources or alternative sources of potable water.

Traffic

The DEIS describes seven transportation measures to mitigate the additional traffic expected to occur on the Kalanianaole Highway during morning and evening peak periods. The statement is made that: "These measures should permit movement of the additional trips through the bottleneck section while maintaining traffic flow similar to today's conditions." The DEIS should state what level of service is presently experienced during peak traffic conditions on Kalanianaole Highway and what can be anticipated with the proposed development. Presently, Kalanianaole Highway has a maximum one-way volume of 3,620 vehicles at the peak hour, which is far in excess of its capacity of 2,650 vehicles.

Its volume-to-capacity ratio of 1.36 is the highest of any major arterial serving Honolulu's primary urban center, according to a report by Honolulu's Department of General Planning entitled, "Preliminary Report on Standards and Controls Related to Conditions Along Major Highways," (July 1982, p. 10). Furthermore, in March 1983, the Neighborhood of East Honolulu polled its constituents on this issue and found that 88 percent of 1121 respondents favored phasing future development of Hawaii Kai with a solution to the traffic problem on Kalanianaole Highway.

Given the existing and predicted traffic conditions that would result from the proposed development a number of secondary impacts can be anticipated which should be addressed in the EIS. These impacts include, for example, expected delays in response time of emergency vehicles, added fuel costs due to slower traffic speeds, and increases in both exterior and interior air pollutants (see air quality section).

Air Quality

Appendix D is an air quality study for the proposed project. It concludes that air quality deterioration from construction can be mitigated through dust control measures and that roadside concentrations of carbon monoxide will be alleviated because newer vehicle fleets will have to satisfy stringent emmission control regulations. Unfortunately, the report ignores exposure to motor vehicle exhaust on the Kalanianaole Highway of commuters inside their vehicles. A report has just been completed on this problem based on research that was sponsored by the U.S. Environmental Protection Agency. The report is entitled, "Field Surveys of Human Exposure to Motor Vehicle Exhaust in Two Microenvironments Using Personal Monitors," (July 1985). It was found that the one hour Hawaii Ambient Air Quality Standard for carbon monoxide was frequently exceeded inside vehicles commuting from Hawaii Kai to the University of Hawaii during peak travel periods, as shown in an excerpt table (see attachment) from that report. Assessing the extent of this problem has only recently become possible through the advent of microelectronics as applied to portable personal exposure monitors. The DEIS should incorporate the results of this research on this topic and address the issue.

Economic Benefits

Employment. The proposed development sites such economic benefits as jobs and increased taxes and revenues to the state. It should also be noted that eventual growth in the area will result in an increased demand and costs relative to the requirements for infrastructure, public/social amenities and needs, recreation and aesthetics.

Aesthetics/Land Use

The DEIS has discussed provisions to ensure protection of makai views, however, no mention has been made to ensure mauka views. What measures, if any will be incorporated into the design/setbacks of the proposed project? Has the project architect considered cluster housing orientation?

Archaeology

Our University archaeological reviewers are not available at this time so our comments on the archaeological section of the DEIS are limited. A cursory study of Hawaii Kai has revealed to us the historical significance of the area. The district of Maunalua has been cited as an "Ili of the ahupua'a of Waimanalo." According to a surviving kamaaina of Maunalua, sweet potatoes were grown in the valleys and on the coastal plain. The village at this place, traces of which may still be seen, was Wawamalu. Other features attributing to its historical significance include: The pahua heiau (now under restoration); the hawea heiau, petroglyphs, ponds and a well. Several sites exist mauka of Hawaii Kai Drive between the Pacific Islands Club and the Post Office. Measures to ensure salvage or preservation of the historical nature of this area should be coordinated with the Office of Historic Preservation.

Recreation/Parks/Open-Space

Although the DEIS cites an abundance of public and private recreational facilities in and abutting the Hawaii Kai community, there is no mention of the impacts to those existing facilities already experiencing over-use such as Hanauma Bay. How will the open-space and park Ordinance No. 4621 be implemented into the design synthesis for the proposed project? Please note that many acres of Hawaii Kai park space are minimally useable because of the rugged topography.

Pedestrian/Bicycle Safety

The DEIS has not addressed our previous concern (June 14, 1985) for pedestrian/bicycle access. The Keahole Street bridge ewa sidewalk is 48" wide. However, the guard railing is set into that 48" space leaving only 33" for a walkway. Furthermore, since the traffic lanes are of minimal width over the bridge, a pedestrian on the ewa side, crossing the bridge, has little safety factor against relatively fast moving traffic. The increase in traffic on Keahole Street that will be generated by this development will increase that risk. The entire community of Hawaii Kai is notorious for its joggers and bicyclists. Many national and international running and cycling events focus in Hawaii Kai. The cost for an additional pedestrian walkway on the ewa (makai) side of the guard rail of the Keahole Street bridge would be minimal and the safety greatly improved.

We appreciate the opportunity to comment on this DEIS.

Yours truly,

Jacqueline N. Miller

Jacqueline N. Miller
Acting Associate Director

Attachment

cc: OEQC
Fred Rodriguez
Patrick Takahashi, Act. Dir., Env. Ctr.
Peter Flachsbart
Jim Woodruff
Martha Diaz-Colon

TABLE 25. EXCEEDANCES OF THE ONE-HOUR HAWAI'I AMBIENT AIR QUALITY STANDARD FOR CO OF 9 PPM BY ROADWAY, TRAVEL MODE, AND COMMUTING PERIOD

	Kalanianaole Highway/H-1 Freeway						Pali Highway		
	Morning			Afternoon			Morning		
Travel mode	No. trips	No. exceed.	%	No. trips	No. exceed.	%	No. trips	No. exceed.	%
Regular auto	104	65	62.5	35	7	20.0	15	10	66.7
Carpool	60	31	51.7						
Express bus	41	9	22.0	29	0	0			
HOV	23	13	56.5						
Bicycle	9	0	0						

Source: Peter G. Flachsbart and Dennis E. Brown, "Field Surveys of Human Exposure to Motor Vehicle Exhaust in Two Microenvironments Using Personal Monitors," Final Report under U.S. EPA Cooperative Agreement CR 808541-01-3, Department of Urban and Regional Planning, University of Hawaii at Manoa, July 1985.

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ, PRESIDENT

1164 FORT STREET MALL, SUITE 200 • P.O. BOX 536 • HONOLULU, HAWAII 96809 • TELEPHONE 808 521 8321

August 26, 1985

Mrs. Jacqueline N. Miller
Acting Associate Director
Environmental Center
University of Hawaii at Manoa
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Mrs. Miller:

We are in receipt of your Center's comments dated August 22, 1985 on the proposed Marina Zoning. We respond in the following:

1. General Comments: It is agreed that Traffic is the most serious concern expressed on the proposed zoning application. Hawaii Kai is similar in many ways to other bedroom communities that radiate outward from Central Honolulu and other employment centers. The ability of existing transportation arterials to accomodate morning and evening peak hour movement has been effectively consumed with the advent of residential development that has taken place since the late 1970s and early 1980s. This project is proposing mitigative measures that are new and innovative from a local commuter's standpoint; they have enjoyed success in various cities on the Mainland and are being proposed locally for the first time. The change in community lifestyle as you have described it, is an alternative that is being proposed by the developer as a plan that can mitigate the anticipated increase in traffic loading attributable to the proposed zoning action. It will cause certain changes in commuter habits, but it is felt that to proceed without proposed mitigative measures such as Rideshare and Park-and-Ride, the ability of housing capacity to keep up with demand will not be effectively satisfied.

   The applicant will be working in close contact with government and community groups as the project continues through the lengthy review process during the zoning application; Planning Commission and City Council will conduct public hearings and detailed discussions on this matter. The subject of implementing these mitigative measures prior to zoning approval will most certainly be a discussion item.

2. Noise: The Noise consultant has responded that as this project zoning application proceeds through the lengthy review still to come, the noise attenuation measures that would be required by FHA/HUD would include those attenuation devices considered essential to comply with their requirements. These measures would result from an updated study of the existing corridors and those homes to be built in the proposed Marina Zoning application. It should also be pointed out here that the present traffic along Kalanianaole Highway does not only come from Hawaii Kai, but from other residential communities as well.

3. Sewage Requirements: The suggestion that standby generators be installed as an independent source of electrical power for future pumping has been provided to the applicant for their review; they have advised that all stand by power generators are installed and in operation.

4. Waste/Waste Disposal: At the present time, collection of solid waste is provided by either the City & County or private collection companies. The City is aggressively pursuing the solution to Oahu's Solid Waste problem and has an obligation to manage Solid Waste for Oahu. This includes the refuse to energy plant under final financing prior to construction.

5. Public Facilities and Services: We stand corrected on the availability of the Kaiser Hospital in Waikiki as a facility available to this East Honolulu community. We also are by this response, including the Straub, Kapiolani, and Kuakini Hospitals as existing alternative facilities.

6. Water: The Board of Water Supply in their comment dated July 19, 1985, indicated no objection to the proposed project. Further, in the event that source development takes place in the Pearl Harbor Groundwater District, appropriate application will be taken with the Division of Water & Land Development, Department of Land & Natural Resources.

7. Traffic: Level of Service Analysis - Appendix C, the "Hawaii Kai Transportation Management Study," includes sections discussing existing morning and evening peak hour traffic conditions and level of services on Kalanianaole Highway (Chapter 3) and conditions with the proposed development and mitigation measures (Chapter 5). In the final report, the Transportation Management Study, we are adding a section at the end of Chapter 3 that address what future traffic conditions would be with the proposed development and without the mitigation actions (rideshare and roadway projects).

   Note that the analysis indicates a maximum existing volume-capacity ratio of .99 on Kalanianaole Highway at Kalaniiki Street during the morning peak hour. Traffic demands exceed the roadway capacity at this location, which results in the extensive queuing observed each school day morning. Please note that analyses presented in the Honolulu Department of General Planning (DGP) report entitled "Preliminary Report on Standards and Controls Related to Conditions Along Major Highways," is based on a very generalized set of assumptions about each roadway corridor. Side street traffic volumes and traffic signal operations, which in large part determine roadway capacity, are assumed to be uniform for the traffic signal-controlled intersections in all corridors in the DGP report. Applying the DGP report procedure to actual Kalanianaole Highway characteristics results in a capacity of 4,200 vehicles per hour and a volume-capacity ratio of .85 for the 3,620 vehicles.

   Project Phasing - Concerning the phasing of the Hawaii Kai Development, the transportation management program proposes a series of rideshare and roadway measures which will be implemented in phases to accommodate the increased travel needs of each new increment of development. These measures are intended to reduce traffic/increase capacity to constrain traffic growth to within the roadway's capacity. These measures will mitigate the effects of travel growth in the corridor until the anticipated time of implementation for the planned State DOT Kalanianaole Highway HOV lane project.

   Impacts on Traffic Speed - The proposed Marina Zoning development is expected to have minimal impact on average travel speed and travel times along Kalanianaole Highway. During the morning, the proposed mitigation measures would reduce traffic or increase capacity sufficiently at the Kalaniiki "bottleneck" to offset the new development traffic. Therefore, the traffic would be able to travel through the bottleneck area in approximately the same time as today. The upstream (more easterly) intersections would experience slight increases in delay, however, this only transfers the location of a portion of the delay time from the Kalaniiki Street intersection to the upstream intersections and does not increase the total corridor delay and travel time.

   During the evening, the increased traffic volumes would result in additional delay at the key traffic signal-controlled intersections and where left-turning traffic stops in the through travel lanes while awaiting a gap in the traffic to make their left turn.

   A computer analysis was made of travel time impacts along Kalanianaole Highway between Hawaii Kai and Ainakoa Avenue. The analysis calculates the increases in travel time and delay at the traffic signal-controlled intersections. The following table indicates the change in average travel time in the peak travel direction (Ewa direction in morning and Koko Head in the evening).

	Current Travel Time (1) (Minutes)	Increase from all New Development (Minutes)	Increase from Marina Zoning (Minutes)
Morning Peak Hour	14-22	.01	Nominal
Evening Peak Hour	15-18	.25	.10

(1) Source: "A study of Technical Aspects in Using Highway Corridor Impacts to Constrain Residential Development on Oahu -- Draft," prepared for City and County of Honolulu Department of General Planning by Darby and Associates, 1985.

The computer analysis also provides an estimate of increased fuel consumption due to the slower speeds and increased stops and delays. Using an average price of $1.50 per gallon for fuel, the increased cost per one-way automobile trip on Kalanianaole Highway would be as follows:

	Morning Peak Hour	Evening Peak Hour
Increase in Fuel costs per Vehicle Trip Between Ainakoa and Hawaii Kai	$0.003	$0.01

Note that these fuel costs reflect increased delay and stops on the cross streets as well as on Kalanianaole Highway.

The increased traffic could affect the fire and paramedic service emergency vehicles operating from the Wailupe Station. Any impacts would likely be limited to the morning peak period from Hawaii Kai inbound (Ewa direction) on the four-lane section to Kirkwood, which would experience an estimated 10 percent increase in traffic, and in the Koko Head direction on this four-lane section in the evening peak hour. During the morning peak period, the emergency services will still be able to use the inbound HOV lane where most of the vehicle queuing and congested conditions occur. Reasonably free flow conditions should continue for emergency vehicles in the off-peak direction during both the morning and evening peak traffic periods.

8. Air Quality: Your comment on the potential impact on motorists from CO within their cars as defined in the recent study "field Surveys of Human Exposure to Motor Vehicle Exhaust in Two Microenvironments Using Personal Monitors" (July, 1985) was unfortunately not provided for our air consultant's review and comment. Barry Root has been provided a copy of your comment and also the table as provided as an exhibit; a definitive response is not available however, due to unavailability of the July, 1985 study. Root states as follows: "There are several serious comparative considerations which make the results of the study invalid for use in an Environmental Impact Study involving a proposed construction project.

Foremost among these considerations is the fact that State of Hawaii ambient air quality standards as established by Public Health Regulations, Chapter 43, and the new proposed revision, Chapter 59 of Title 11, apply only to the general OUTDOOR atmosphere. It was never intended that these standards be used to evaluate air quality inside a moving vehicle. Ambient air quality standards were meant to be applied at a given outdoor fixed point over a given fixed period of time. While it is entirely true that ambient air quality standards are designed to protect public health and welfare, it is not valid to use these values for comparison purposes in situations where they are not applicable.

A further problem exists in using this data for comparative purposes because the amount of time actually spent commuting cannot have been exactly the same for all commuters involved. If the values recorded are for less than a one hour period they must somehow be statistically normalized for direct comparison to one hour standards. From the table of results provided it is clear that the level of carbon monoxide inside different types of vehicles varies significantly. This implies that the levels measured are related to the particular vehicles involved and might be the same if some other higher corridor, such as the Kahekili Highway, had been used to make the commute. Such a result would totally negate this approach for EIS evaluation purposes. One factor mitigating against use of carbon monoxide concentrations measured inside moving vehicles for an EIS evaluation is that the body of measured data is so small that the mathematical relationship to traffic volume or level of congestion, if any, has yet to be established. Thus, the data cannot be used in any predictive way to evaluate the impact of future projects.

It was most interesting to note, however, that the bicycle riders include in the study did not encounter any carbon monoxide levels above State of Hawaii ambient air quality standards. This implies that AMBIENT air quality along the Hawaii Kai commuting corridor is currently within Hawaii standards and that levels of carbon monoxide computed in the EIS for this area are suitably conservative." We would defer to the State Department of Health in this instance, and comply with the requirements that would result from their review of this most current study.

9. Economic Benefits: The applicant is required to meet certain ordinances in forces under the City & County of Honolulu that mandate providing adequate Parks and Recreation facilities, and the State Department of Education has commented in the EIS Preparation Notice that the ability to provide adequate educational facilities will be phased as the project schedule is implemented. Adequate infrastructure is currently available due to Hawaii Kai's Master Plan and community services for sewerage, drainage, and internal street circulation.

10. Aesthetics/Land Use: All design considerations for structural improvements must meet City code standards for setback.

Planning for the Marina Zoning limits building heights around the Hawaii Kai Marina to a maximum of 60'. The higher structures will be located against Mariner's Ridge to preserve both mauka and makai views.

11. Archaeology: All cultural and historic sites as defined in the study provided are subject to the Historic Preservation Office review and recommendations. There has been no comment to date.

12. Recreation/Parks/Open Space: Compliance with Ordinance No. 4621 will be met with the input of the Department of Parks & Recreation who are in negotiations with the applicant. Final determination is contingent on the phasing schedule of the proposed project and the demand factors that will result from the development schedule. These considerations are also part of the review process that will be taking place during the Planning Commission and City Council review.

13. Pedestrian/Bicycle Safety: This concern as stated in your comment on the EISPN (June 14, 1985) was not ignored, but we did not receive from the applicant, the latest information as to how the additional pedestrian spacing can be provided on the Keahole Street bridge. This data consists of structural improvements from the bridge design form as well as costs to be incurred, and finally, the compliance with the City & County of Honolulu for possible dedication of the facility improvements. It is an unresolved issue.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 • 2540 Dole Street
Honolulu, Hawaii 96822

26 July 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: Draft Environmental Impact Statement for Hawaii Kai Marina Zoning, Hawaii Kai, Honolulu District, Island of Oahu, Hawaii, July 1985

We have reviewed the subject DEIS and have no comment to offer. Thank you for the opportunity to comment. This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator, WRRC

ETM:jmn

cc: F.J. Rodriguez
Env. Comm. Inc.

NO RESPONSE NEEDED

AUG 5 1985

DEPARTMENT OF THE NAVY
HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO
9510
Ser 002B/1280

15 JUL 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

ENVIRONMENTAL IMPACT STATEMENT
HAWAII KAI MARINA ZONING

The Draft EIS for Hawaii Kai Marina Zoning has been reviewed and we have no comments.

Thank you for the opportunity to review the Draft EIS.

Sincerely,

P. O'CONNOR
Captain, U.S. Navy
Chief of Staff

Copy to:
Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

NO RESPONSE NEEDED

7-15-85

Rodriguez

United States Department of Agriculture
Soil Conservation Service
P.O. Box 50004
Honolulu, Hawaii
96850

July 25, 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Whalen:

Subject: Draft EIS for Hawaii Kai Marina Zoning
Hawaii Kai, Oahu, Hawaii

We reviewed the subject draft environmental impact statement and have no comments to make.

Thank you for the opportunity to review the document.

Sincerely,

FRANCIS C.H. LUM
State Conservationist

cc:
Mr. F. J. Rodriguez
Environmental Communications, Inc.
P.O. Box 536
Honolulu, HI 96809

NO RESPONSE NEEDED

The Soil Conservation Service is an agency of the United States Department of Agriculture

50

JUL 29 1985

U.S. Government Printing Office: 1983—420-938/1378

US Department of Transportation
United States Coast Guard

Commander
Fourteenth Coast Guard District

Prince Kalanianaole
Federal Building
300 Ala Moana Blvd.
Honolulu, Hawaii 96850
Phone: (808)546-2861

16475
Serial No. 5/170
29 July 1985

Ms. Letitia N. Uyehara, Director
Office of Environmental Quality Control
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Dear Ms. Uyehara:

The Fourteenth Coast Guard District has reviewed the DRAFT ENVIRONMENTAL IMPACT STATEMENT for the ZONING OF HAWAII KAI MARINA and has no objection or constructive comments to offer at the present time.

Sincerely,

J. F. MILBRAND
Commander, U. S. Coast Guard
District Planning Officer
By direction of Commander,
Fourteenth Coast Guard District

Copy: Mr. F. J. Rodriguez

NO RESPONSE NEEDED

AUG 2 1985

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P. O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:
ES
Room 6307
JUL 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement (DEIS), Hawaii Kai Marina Zoning, Honolulu, Hawaii

Dear Mr. Whalen:

The U.S. Fish and Wildlife Service has reviewed the referenced DEIS and has no further comments.

We appreciate the opportunity to comment.

Sincerely,

Ernest Fosaka
Project Leader
Office of Environmental Services

cc: DLUR
Environmental Communications, Inc.

NO RESPONSE NEEDED

AUG 1 1985

HAWAIIAN ELECTRIC COMPANY, INC. · PO BOX 2750 · HONOLULU, HAWAII 96840

ENV 2-1
NV/G

Brenner Munger, Ph.D., P.E.
Manager
Environmental Department
(808) 548-6880

August 6, 1985

Mr. John P. Whalen, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Whalen:

Subject: Draft Environmental Impact Statement for Hawaii Kai Marina Zoning

We have reviewed the attached Draft EIS and find that HECO's existing facilities will be adequate to serve the proposed development providing that two additional five inch ducts are installed along Wailua Street.

Thank you for the opportunity to comment on this project.

Sincerely,

Brenner Munger

Brenner Munger, Ph.D., P.E.
Manager, Environmental Department

cal

cc: Mr. F. J. Rodriguez
Environmental Communications, Inc. ✓

AUG 8 1985

A Hawaiian Electric Industries Company

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

August 26, 1985

Dr. Brenner Munger
Manager, Environmental Department
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840

Dear Dr. Munger:

We are in receipt of your company's comments dated August 6, 1985 and we respond in the following:

The requested five inch ducts will be discussed with appropriate HEI staff when the final construction plans for the utilities are completed. As this proposed project continues through the various land use policy review procedures, the applicant will be maintaining contact with the various utilities involved.

Thank you for your continuing interest and concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1148 FORT STREET MALL, SUITE 200 • P.O. BOX 538 • HONOLULU, HAWAII 96809 • TELEPHONE 808-521-2481

HAWAII KAI NEIGHBORHOOD BOARD NO. 1
P. O. BOX 25804
HONOLULU, HAWAII 96825

Wednesday, August 21, 1985

Mr. John P. Whalen
Director
Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Re: Review of Draft Environmental Impact Statement for Marina Zoning, Hawaii Kai

Dear Mr. Whalen:

Pursuant to our receipt of Ms. Letitia N. Uyehara's letter of transmittal dated July 8, 1985, with a copy of the approximate 260-page Draft Environmental Impact Statement for Marina Zoning for Hawaii Kai dated July 1985, and pursuant to Ms. Uyehara's subsequent letter extending the deadline for submission of comments to your office, from August 7, 1985 to August 22, 1985, the Hawaii Kai Neighborhood Board held an official Special Meeting at 7:00pm, on Thursday, August 15, 1985, at the Hawaii Kai Library.

There are 15 elected members on the Hawaii Kai Neighborhood Board, with 4 At-Large members, and 11 Sub-District Representatives. There were 8 Board members present at the meeting: Anthony W. DePaul, Jr. (Kalama Valley); Quincy H. Kaneshiro (Lunalilo Park, Mauka); Alfred Kirchner (Mariner's Ridge and Mariner's Cove); Ed Schuyler Lott (West Marina); Stafford-Ames Morse (East Marina); Bill Walden (Koko Kai); Allan J. Wanamaker (Hahaione Valley); and Mary A. Wilkinson (Hahaione/Hawaii Kai Drive High-Rise Condominiums). Although the 8 members represented a quorum for official business, the members present agreed not to submit comments as a Board, because several of the members did not have copies of the Draft EIS available to them. The Hawaii Kai Neighborhood Board received only one copy of the Draft EIS, and sharing this single copy among 15 persons was not possible. Several members of the Board did make special efforts to obtain additional copies, but only approximately 5 copies were obtainable.

Our communication with the State Environmental Quality Control Office revealed that only 60 copies of the Draft EIS were produced, in accordance with present regulations, and it is our understanding that most of the copies remain in State and City & County offices. With the full realization of this necessity of copies for government agencies, we strongly recommend that in the future,

AUG 22 1985

a copy of Draft EIS's be made more readily available. We understand that copies of the DEIS were sent to the 3 regional Libraries (Kaimuki, Kaneohe, and Pearl City), and the Hawaii Kai Library, but we were only able to locate the copy at the Hawaii Kai Library. Several members of our Board were advised that your office did not have any additional copies of the DEIS for our use.

The members of our Board, and the attendees of the August 15, 1985 meeting thus agreed to make individual comments to your office, as follows, concerning the DEIS:

1. Anthony W. Depaul, Jr: "The transportation system management's 'Ride-sharing Program' represents a best-case scenario, with no cushion or allowance for errors in estimated participation, and traffic reduction. Recommendations in the DEIS, if implemented, would imply in theory, that the State need not proceed with their expansions plans for Kalanianaole Highway, which is totally unacceptable. I am not negative on the Marina development; but the highways and infrastructure should be made to support such development, and these important items do not exist now. I recommend that someone monitor the success of the proposed ride-sharing measures, and that the development be controlled in phases." Note 1: Mr. DePaul submitted a 3-page report (copy enclosed) at this meeting, commenting on the DEIS. He advised that although he is the Chairperson of the Neighborhood Board's Transportation Committee, his Committee had not yet met to adopt this report. Note 2: At the Monday, August 19, 1985 meeting of this Transportation Committee, the members essentially approved and accepted Mr. DePaul's report.

2. Bill Walden: "I agree with all of Tony's report. The transportation aspect of the DEIS is the important and critical portion of the entire matter. I am concerned as to what the impact of highway construction will be during the development. And is there any way that the (ridesharing) measures can be implemented ahead of time, to test their effectiveness? Why is it that there is not even one single-family residence planned in this Marina Zoning? It seems to me that not having any single-family residences is creating too much congestion, and that a better mix should be looked at.

3. Dan Davidson, Manager, Land Use, Kaiser Development Company (seated in the audience, at this public meeting): "Kaiser would have really liked to included some single-family residences in our (Marina) development, but the City rejected this.

They (the City) rejected this in 1981, and again in 1983. The City's planning policy is for higher density." Note: In the DEIS, Section VI, page VI-1, discusses "Alternatives to the Proposed Action," and alternative "B" for Single Family Residences is indicated as being rejected by the City.

4. Ed Schuyler Lott: "I am concerned that Hawaii Kai has been compared to Mililani, and Makakilo, and other areas. Hawaii Kai is unique and different, with its own characteristics."

5. Allan J. Wanamaker: "Henry J. Kaiser would not do what is being done today. I think he would be disappointed if he saw what is happening today. EIS's are basically self-serving. They are paid for by developers. There is a very delicate balance, and there is a good chance of things sliding the wrong way. We (the Board) are not governmental. I really don't think we have the knowledge, and resources to properly review something as detailed and involved as an EIS. I have not had a chance to completely review the EIS, but will be submitting my comments after this weekend (by Monday, August 19, 1985)." Note: Quincy H. Kaneshiro, Chairperson of the Board, received Mr. Wanamaker's 2-page letter of August 18, 1985, on Monday, August 19, 1985, a copy of which is enclosed herewith.

6. Alfred Kirchner: Mr. Kirchner reminded all present that the comments being made at the meeting are individual comments, not comments from the Board collectively. Mr. Kirchner commented: "The map (in the DEIS), on page IV-8, of Hawaii Kai, shows Hawaii Kai Drive as being completed (mauka of the present Anchorage subdivision, to the present Mariner's Cove area), but it is in fact not true, and the traffic situation can be easily misunderstood."
"The issue of the 10% amount of moderate and low-income housing is not properly addressed and included in the study. This is an important item, and it appears that this responsibility is being passed. This should have been covered in greater detail in the Social Impact section of the study (the DEIS). I am bothered by the fact that this study is not entirely open in its presentation of certain conditions. For example, for the residents on Mariner's Ridge, particularly the lower sections, the view of the

Marina area will be changed. It may be changed not to a great extent, but residents will be looking into the backs of the planned high-rise buildings at the foot of the Ridge. The study (the DEIS) states that views will be impacted only in a minor sense, but I really don't think this is telling the complete story. I am not against development, but I do think these studies should give people a truer picture of what is being proposed. The impact on the Anchorage area will be significant."
"As I said, I'm not against development, but if we can look back years ago, when Kaiser was planning to build the Kuapa Kai Shopping Center, many, many people were up in arms about how the Center would have negative effects on the community, but look at it today. There are not many complaints about it, and virtually everyone goes there....so people's feelings do change."

7. Stafford-Ames Morse: "I am in 100% concurence with the transportation report given by Tony DePaul. I think that the arterial reserve is very important (along Keahole Street, Hawaii Kai Drive, and along Wailua Street). I feel strongly that the dust controls have been inadequate in the past. One very important issue that has not been raised is the impact on the use of the Marina. This is of great concern. The Social Impact statements (in the DEIS), on pages IV-28 through IV-30 are very general in description, and do not address the issues surrounding the use of the Marina. As with Al, I am also concerned that the 10% housing issue is not being addressed. I am not happy with so few copies of the DEIS made available to us, and not enough time is being given to us for a proper review of this most important development.

8. Ron McKee, Resident of the Anchorage subdivision, and a member of the Board of Directors of the Anchorage Community Association (seated in the audience area of the meeting):
"The high-rises planned adjacent to the Anchorage is of great concern to us. We are concerned that these high-rise condominiums are being put right across the street from expensive single-family residences. This is an example of poor planning. We have only a 40-foot wide residential street, and the impacts of increased amounts of traffic, off-street parking needs, noise, and overall congestion must be considered."

"I think the high-rises should at least be down-scaled, from the 15 stories that are being planned, to a 6-story limit. The realignment of the buildings should also be a consideration." Note: The Anchorage Community Association submitted its letter of July 29, 1985 to be a part of this summary of comments on the DEIS. (See copy of this 2-page letter, enclosed).

9. Dan Davidson, of Kaiser Development: Comment, in response to questions about developers' disclosures of future development activity: "(In the case of the Anchorage), Hartford Holdings was supposed to make full and clear disclosure on future developments. We (Kaiser Development) are making very clear and complete disclosures on our new development further up (from the Anchorage) and sales are going extremely well. We are very pleased with the activity, and the project looks to be well-accepted."
"Regarding the traffic question, I would like to distribute this (letter of August 15, 1985, having 3 pages, addressed to Quincy H. Kaneshiro; copy enclosed herewith). Kaiser's traffic consultant did a very thorough and complete job of analyzing the impact of the estimated increase in traffic and we really believe that the measures that are being proposed are realistic. Locations, Inc. did a study for us, on property values in the Hawaii Kai and Marina area, and it showed that property values have not decreased, and have in fact increased in many specific areas, so our development programs should be regarded as very successful. Kuapa Kai was once objected to, but is now highly acceptable. One of the best answers we have is: Quality. It has solved many possible problems for us, and we are committed to continue to development quality housing. The zoning process for us is extremely expensive, and behooves us to do a lot of zoning all at once. This may seem frightening, but we have to realize that the actual construction is being done in phases, rather than all at once, and economic conditions will have to be dealt with. In one of the unilateral agreements we are working with the City there are 6 pages of Conditions by the City, so you see we aren't getting it all our way. We are working together. Prices cannot be listed, of course. We really appreciate the dialog that is going on right now with the Neighborhood Board and other community interests."

"We have to deal with our population growth, and the needs of the people, but we are not willing to limit our development based on improvements on the highway (Kalanianaole Highway)."
Note: Mr. Davidson has sent Quincy H. Kaneshiro an additional letter, dated August 20, 1985, pertaining to revised "trip generation figures" at Kawaihae Street; a copy of this letter is enclosed herewith).

10. Phil Estermann, (resident of Hawaii Kai, and member of the Hawaii Kai Neighborhood Board's Transportation Committee):
"The increased traffic, primarily on Kalanianaole Highway, is a major concern I have. I think there may be doubts as to whether some of the measures being proposed will work or not."

11. Stan Fujimoto, (Chief Enginerr, Kaiser Development, "Ikekai," formerly known as Queen's Beach; and member, NB Transportation Committee):
"Traffic situations are a matter of perception. The costs of driving are going to increase, no matter what we try to do to hold them down. Fuel costs will increase, insurance costs will go up. People have to realize that making changes is not really too difficult. It will be a matter of increasing convenience. (In the DEIS), we are trying to hold the traffic congestion constant. What we are saying is that it should not get any worse, providing people are willing to make some changes.

12. Anthony DePaul, Jr: "Kaiser (Henry J. Kaiser) wanted no retirement home here in Hawaii Kai. Handy's book mentions this. What are the new demographics of the future of Hawaii Kai? This is not really addressed in the DEIS."

13. Quincy H. Kaneshiro: "I think it is obvious that no one here tonight is really against further development in Hawaii Kai. I feel that Kaiser Development is de[illegible]ating, more than at any other time in their presence in Hawa Kai, that they really do wish to have quality develop ment. I think that the time and effort they are putting into obtaining community input, and their sincere interest in the activities of our Neighborhoo Board is unprecedented. I don't think anyone here feels that the traffic congestion along Kalanianaole Highway is Kaiser Development's fault. This situatio is a failing of our political representatives and the State and City and County governments."

"It is time for us to meet with our representatives in government, immediately, for constructive action to accelerate the improvements to Kai Highway."
"The Draft Environmental Impact Statement, in my opinion does not offer realistic solutions to the traffic loads expected. I have said it before, and I will say it again, why should the residents of Hawaii Kai have to be the ones to make all the life-style changes being proposed in the DEIS, and so many other transit studies? Why not use the tried and proven method of simply widening an existing highway? I think the State should take yet another look at the 3-phase approach to the 5 to 10-year Kalanianaole Highway project, and make immediate improvements to provide additional left-hand turn stacking lanes into Niu Valley, and Kuliouou Valley, and Kawaihae Street. The residents in these areas have known for years that highway improvements were planned, and property condemnations are inevitable. Congestion along the Highway can be relieved, and safety improved, if certain left-turns are simply banned during peak morning and afternoon traffic hours. There are too many drivers on the Highway that are being emotionally pressured into taking extra risks in making left-hand turns, and this situation gives rise to continuing numbers of traffic-jamming, and injury-causing accidents.

14. Quincy H. Kaneshiro, for Debra Willis (Member of the Neighborhood Board, unable to attend the meeting of August 15, 1985):
"The EIS raises more questions than it answers."

15. Bob Murphy, resident of Kalama Valley: "There are certain unwritten rules of moral responsibility to the community. The highway development is definitely needed with the further development of Hawaii Kai. I have a question on the 4 percent change in life-style, and doubt whether this figure is really accurate. Thus far I see no material support from Kaiser (Development) for highway improvements."

The meeting was attended by approximately 20 persons in total, and the meeting was adjourned at 9:15pm.

Pertaining to the overall concept and use of Environmental Impact Statements, Quincy H. Kaneshiro did receive comments prior to, during, and after the above described meeting that the cost of such EIS's be disclosed to the public. The transportation issue on Kalanianaole Highway is the major issue in this EIS, and it is not felt that this report properly and fully complies with Mr. Wayne J. Yamasaki's letter of June 18, 1985, requesting a scenario (of the

traffic congestion on Kalanianaole Highway), without the ridesharing measures. Mr. F.J. Rodriguez's letter of response to Quincy H. Kaneshiro, dated July 1, 1985 also has a strong statement, of questionable community popularity: "It must be pointed out, however, that prohibiting development in Hawaii Kai until highway impacts are made is not considered an acceptable alternative by the developer." This hard-line stand is unreasonable, and many comments have been made by community groups and individual concerned residents that a gradual phasing program of highway improvements with development progress will be more reasonable and equitable for everyone.

Thank you for giving our Neighborhood Board the opportunity for this review and commentary, and we certainly hope our views will be helpful in the planning process. The matter of having enough EIS copies available to a Neighborhood Board is more important and sensible than ever, in the light of Neighborhood Board now being permitted to make recommendations to State departments and adminstration, as well as City & County officials; and the fact the Neighborhood Board members, duly elected by their constituents, should be in perhaps the best position to assess "Environmental Impacts."

cc: Ms. Laurie Tam,
Neighborhood Commission

Neighborhood Board No. 1 Members

Mr. F.J. Rodriguez
Environmental Communications, Inc.

Respectfully Submitted,

Quincy H. Kaneshiro
Chairperson
Hawaii Kai Neighborhood Board No. 1
P.O. Box 25804
Honolulu, Hawaii 96825
Tel: 395-8314

QHK:djas

August 15, 1985

TRANSPORTATION COMMENTS ON MARINA ZONING
DRAFT ENVIRONMENTAL IMPACT STATEMENT

1. Section IV of the Draft Environmental Impact Statement (hereafter referred to as DEIS) profiles the existing Hawaii Kai community as young households averaging 3.4 people per household, with a large percentage (73%) of employable people and the second lowest unemployment rate in the county. These residents have high median incomes and a large percentage of people who drive their own cars to work (88%).

2. The Marina Zoning proposal projects an increase of 5270 persons (an average of 2.2 people per household). The DEIS is extremely vague as to the demographics of this new population, but anticipates that "the new population will possess similar socio-economic characteristics" as the existing population. Verbal statements by the developer's representatives at the July Neighborhood Board meeting, however, anticipate that there would be major changes in the demographic characteristics of the new population, and by inference, a population that would not go anywhere in the sense of generating additional traffic.

3. The projected demographic changes and the socio-economic impacts in Hawaii Kai should be spelled out in more precise terms and the DEIS should be amended to include these impacts. While these issues are of significant interest to the Board in terms of the quality of life in Hawaii Kai, from the transportation aspect they are of considerable importance since they are the basis on which traffic generation is determined.

4. The Transportation Management Study (Appendix C to the DEIS) presents a "best case" scenario wherein every assumed condition and consequence has to materialize in order to achieve the desired results, i.e., there is no built-in slack or cushion to accommodate any error in estimates or the significant assumed conditions on which the study is based; specifically:

a. The projected increases in daily vehicle trips is based on major changes in the demographics of Hawaii Kai which may or may not materialize. The extremely low trip generation rates do not appear to allow for any variation on the upside, and do not seem to account for the tendency of our residents to drive their cars.

b. From already low vehicle trip projections, there are generous reductions to these projections based on an estimation of trips that would be diverted from Honolulu to the Marina Business Center for work and shopping.

c. The Study recommends an ambitious Ridesharing Program that requires "a 20% increase in Hawaii Kai resident use of buses, vanpools, and carpools as compared to continuation of current travel mode use." With regard to the Ridesharing reductions in traffic, the following comments are pertinent:

(1) The projected reductions due to ridesharing measures are only estimates based on a number of hypotheses. They should not and cannot be given the weight of facts. Given the fact that an overwhelming percentage of Hawaii Kai residents prefer to drive their own cars (See para 1, above.), these projected reductions have to be approached with considerable caution.

(2) Usage of public transit is already the highest on Oahu. Therefore the "easy" part has probably already been obtained. Each added increment will become increasing difficult to achieve.

(3) Few of the reductions in traffic due to ridesharing will happen by themselves; they will have to be made to happen. This is the function of the proposed Transportation Manager. However, to arbitrarily assign a reduction of 50 peak hour vehicle trips to the employment of the Transportation Manager in addition to the reductions projected for all other measures appears to be double-counting.

5. Even after all the number-crunching, after completion of construction projects (pedestrian overpass), after implementation of all ridesharing measures, etc., the bottom-line conclusion of the Transportation Management Study is that:

a. The Kalanianaole Highway-Kalaniiki Street intersection will be AT SATURATION during the morning peak hours.

b. Traffic will INCREASE on Kalanianaole Highway during the evening peak hours, worsening an already unsatisfactory situation, even though key intersections may not reach their theoretical saturation.

c. Traffic will increase during the non-peak hours on Kalanianaole Highway. In other words, Kalanianaole Highway will become more unsatisfactory for longer periods of the day.

It is emphasized that this is as good as it is going to get. Any failure to achieve any specific reduction or any increase in actual traffic loads will exacerbate this situation even more.

6. Since the developer has no control over the planned State DOT median reversible lane project, the desire to keep Marina Zoning independent of the State project is understandable; however, from the Hawaii Kai residents' point of view, such a position is totally unrealistic:

a. That the developer has the best of intentions to minimize the traffic impacts is acknowledged; however, the risk and burden of any adverse impacts from an inability to achieve any objective will fall most directly on the Hawaii Kai commuter — not the developer.

b. Further, the Study would have us believe that the developer can "manage" our way out of a very difficult problem that has become increasingly unmanageable, and in so doing will tend to remove any incentive for the State to move ahead with the Kalanianaole Highway improvements. We could easily wind up obtaining minor improvements at the expense of the total package to improve Kalanianaole Highway since the Study is effectively saying that we can tolerate a major development with no significant improvements to the major arterial into and out of Hawaii Kai.

7. The DEIS assumed that public transit would increase proportionate to increases

in total Hawaii Kai trips. However, the DEIS does not provide any environmental impact of an increase in transit activity through almost wholly residential neighborhoods.

8. Major portions of this zoning proposal cover land areas that have been previously designated as a freeway reserve. While a limited access freeway, as such, may never materialize, it is generally agreed that some sort of major arterial across Hawaii Kai will be necessary. The Marina Zoning could have a significant impact since a major arterial would probably require reconstruction and realignment of the Hawaii Kai Drive/Wailua Street and Wailua Street/Lunalilo Home Road intersections, and widening Wailua Road among other things. The concern at this time is that the DEIS does not acknowledge these future requirements and the impacts that the Marina Zoning will or will not have on the ability to construct a freeway or major arterial. On the surface it appears that the land required to support these roadway improvements will be developed.

9. The foregoing comments are not intended to be negative on development or on the Marina Zoning proposal, per se. They are intended to emphasize the long-standing Board position that development and transportation go hand-in-hand. In other words development should proceed only when the infrastructure is in place to support it. To develop first and hope for the best on transportation would undoubtedly be unacceptable to the vast majority of Hawaii Kai residents. It may well be that the developer can "manage" our way out of a difficult situation; but before the Board endorses a major development in Hawaii Kai, there should be hard facts to support any contention that the traffic impacts can be minimized. Regrettably, the DEIS simply does not provide such facts.

10. Accordingly, it is recommended:

a. That no major development be approved until such time as there is a firm commitment out of the State to a construction program for the long-range improvements to Kalanianaole Highway.

b. That the ridesharing measures be implemented as soon as practible, and a program established to monitor and measure their effectiveness and the impacts of on-going and future development traffic loading on Kalanianaole Hwy.

c. That, in the interim (i.e., until the State improves Kalanianaole Highway), development be limited to well-defined phases or increments that can be accommodated within demonstrated achievements (reductions in traffic load) of the ridesharing programs. Future development should be keyed to and driven by improvements in the overall traffic situation.

[Note: This report was prepared by Anthony W. DePaul, Jr., Chairperson, Transportation Committee, Hawaii Kai Neighborhood Board]

Allan J. Wanamaker

August 18, 1985

Mr. Quincy Kaneshiro
Chairman, Hawaii Kai Neighborhood Board

Mon 8/19/85

Dear Quincy,

After reviewing the Draft EIS for the proposed Marina Zoning, I would now like to present my comments. Let me oreface them by noting that I have sought some input from people in my sub-district, and have noted their input where applicable.

TRAFFIC IMPACT:

I agree with the comments presented by Tony DePaul, head of the Traffic Committee, of which I am a member. I would further suggest that the proposals of Wilbur Smith and Associates could be tested as to their validity pertaining to the reduction of traffic by car/van pooling, increased bus ridership, etc.

Funds exist in our budget for surveys, and I suggest that a comprehensive plan could be developed in which we would poll the residents and Kaiser/Wilbur Smith would assist in establishing the reduction program.

After all, if the developer is sure these proposals will work in the future, why not try at least a limited introduction now, when roads are at capacity? We would share in the cost of implementing at least a part of their proposals and it should be a valid test as to future expectations.

COMPATABLE LIFESTYLES:

Residents I've spoken to do not seem opposed to the type mix of growth that Hawaii Kai has had to date, i.e., mostly single family and low rise housing. However, most dispute the developer's claim that 2400 medium and hi-rise units will enhance their lifestyle. This is understandable to me as my district is nearly all single family homes.

HYDROLOGICAL CHARACTERISTICS AND WATER SUPPLY:

According to Gordon Dugan, who did the hydrological study, phosphates and free nitrogen counts-can be expected to rise as a result of the increase in habitation. Effects on our marina and ocean outfall areas need to be accurately assessed.

In view of the severe water shortages we have been experiencing, is the developer planning to seek new sources of water, such as deep wells? And what is the certainty that a new, potable supply will be found to offset our already critical supplies?

56 N HOTEL ST., HONOLULU, HAWAII 96817 (808) 536-5595

SEWAGE:

As stated by the developer, capacity is not now available to handle the completed project. How is Kaiser planning to remedy this, and what will be the impact on the areas affected?

TRAFFIC ASSUMPTIONS:

As much as Kaiser has said that this will be a phased-in project, they hedge by stating "Actual economic and real estate market conditions may shorten or lengthen this period." (Section IV-6, sec E., 2nd par.)

In light of this statement, all plans should be viewed with this eventuality in mind.

SOCIAL IMPACT:

According to M.W. Caulfield, who researched this, (see Appendix F, page 10, item 3.), "...most of the people who live in Hawaii Kai made a conscious choice to do so because of the advantages the area has to offer... have made a financial and emotional commitments and are strongly motivated to maintain and enhance the existing lifestyle."

Ms Caulfield goes on to describe the various impacts current residents will experience due to these proposals. Although she concludes that the proposed development will essentially be what Kaiser says, I wonder how she came to these conclusions in light of my above observations.

Lastly, I would like to repeat my statement that I feel the whole EIS system has degenerated into something which it wasn't supposed to be. Since the US Corps of Engineers has abdicated its responsibilities to which it was originally assigned, developers and others are free to make up their own EIS and it is left to reletively unprofessional persons such as our-selves with limited resources to decifer and test the reasonability of their wishes.

Sincerely,

Allan J. Wanamaker

Anchorage Community Association P. O. Box 25205/Honolulu, Hawaii 96825

29 JULY 1985

HAWAII KAI NEIGHBORHOOD BOARD NO.1
P.O. BOX 25804
HONOLULU, HAWAII 96825

DEAR BOARD MEMBERS:

THE ANCHORAGE COMMUNITY ASSOCIATION MEMBERS HAVE EXPRESSED CONCERN TO THE BOARD OF DIRECTORS REGARDING THE PROPOSED ZONING CHANGES SUBMITTED TO THE CITY AND COUNTY OF HONOLULU BY THE KAISER DEVELOPMENT COMPANY.

AS WE NOW UNDERSTAND, THE PROPOSED ZONING CHANGES WOULD ALLOW UPWARDS OF 2400 NEW LOW AND MEDIUM DENSITY APARTMENT BUILDINGS TO BE CONSTRUCTED WITH AN ESTIMATED POPULATION INCREASE OF 5270.

THE MAJOR CONCERN OF THE ANCHORAGE COMMUNITY ASSOCIATION IS THE IMPACT UPON GENERAL TRAFFIC CONDITIONS IN THE EAST HONOLULU AREA AND THE ENORMOUS IMPACT IT WILL HAVE ON KALANIANAOLE HIGHWAY.

THE "HAWAII KAI TRANSPORTATION MANAGEMENT STUDY" PREPARED BY WILBER SMITH AND ASSOCIATE, WHICH WAS COMMISSIONED BY KAISER DEVELOPMENT COMPANY, STATES THAT BY THE YEAR 1994 WITHOUT IMPLANTING ANY RECOMMENDED DEPARTMENT OF TRANSPORTATION PROGRAMS, TRAFFIC WOULD INCREASE AT PEAK TRAFFIC HOURS BY APPROXIMATELY 770 ADDITIONAL VEHICLES. IF THE ZONING CHANGES ARE ALLOWED AS PROPOSED AND DEVELOPMENT BRINGS AN ADDITIONAL 5270 NEW RESIDENTS, HOW IS IT POSSIBLE THAT ONLY 770 ADDITIONAL VEHICLES WOULD BE GENERATED ON AN ALREADY OVER-USED AND PROBLEM RIDDEN KALANIANAOLE HIGHWAY?? (BASED ON 5270 PEOPLE AND 770 VEHICLES THAT COMPUTES TO 6.8 PERSONS PER VEHICLE)

(CONTINUED)

HAWAII KAI NEIGHBORHOOD BOARD NO.1
HONOLULU, HAWAII 96825

FURTHER CONCERNS ABOUT THE TRAFFIC CONGESTION RAISES THE QUESTION ABOUT EMERGENCY SERVICES BEING UNABLE TO INSURE RAPID AND EFFECTIVE RESPONSES IN THE HAWAII KAI AREA. THE INCREASED TRAFFIC CONGESTION CREATED BY THE PROPOSED ZONING CHANGES IS BUT ONE, THE MOST IMPORTANT ONE, CONCERN WE HAVE REGARDING DEVELOPMENT PLANS AS PROPOSED. OTHER OBJECTIONS WE HAVE ARE INSUFFICIENT COMPARED TO THE TRAFFIC CONGESTION. TRAFFIC IS A PROBLEM TODAY WITHOUT ADDING ONE ADDITIONAL CAR IN HAWAII KAI!!!!!

WE ASK THAT THE NEIGHBORHOOD BOARD CAREFULLY CONSIDER THE ZONING CHANGE PACKAGE AS PROPOSED BY KAISER DEVELOPMENT COMPANY AND ADDRESS THE PROBLEMS IT WILL CREATE IF ACCEPTED AS PROPOSED. WE UNDERSTAND THAT THERE IS NO EASY ANSWER TO THIS MATTER AND SUGGEST THAT EACH AREA THAT IS BEING ASKED TO REZONE BE CONSIDERED SEPARATELY BY THE NEIGHBORHOOD BOARD.

IN REVIEWING THE SEVEN PARCELS REQUESTED FOR ZONING CHANGES WE FIND THAT THE NUMBER OF UNITS RANGE FROM 100 UNITS IN MARINA 11(B) TO 1020 UNITS IN KALUANUI I. WE SUGGEST AND RECOMMEND THAT THE NUMBER OF UNITS PER PARCEL BE REDUCED OR IF FEASIBLE, BE SPREAD MORE EVENLY SO THAT NO ONE AREA IS IMPACTED MORE THAN ANOTHER.

RESPECTFULLY,
THE ANCHORAGE COMMUNITY ASSOCIATION

BOARD OF DIRECTORS

HAWAII KAI

"Hawaii by the sea
where a weekend is all week long"

Reviewed BY CHK Thu 8/15/85 7:50pm

August 15, 1985

Mr. Quincy H. Kaneshiro, Chair
Neighborhood Board No. 1
P. O. Box 25804
Honolulu, Hawaii 96825

Dear Mr. Kaneshiro and Members
of Neighborhood Board No. 1:

Subject: HAWAII KAI TRANSPORTATION MANAGEMENT STUDY
PEAK HOUR VEHICLE TRIP GENERATION

At the July 29th Neighborhood Board meeting, a few members of the Board asked questions regarding the number of peak hour vehicle trips on Kalanianaole Highway that will be generated by the Marina Zoning development and other zoned parcels. It was mentioned that the figure of 770 trips at Kalaniiki Street during the morning peak hour, estimated by our consultant Wilbur Smith & Associates, seemed low. Please note that the peak hour is not the entire peak period. It is the hour with the highest volume of traffic; i.e., approximately 6:45 a.m. to 7:45 a.m. at Kalaniiki Street next to Kalani High School, earlier at Kawaihae Street in Hawaii Kai.

Next Monday, we will be providing Mr. Anthony DePaul's Transportation Committee with a package of materials on this issue, but I wanted to summarize several points for the Board tonight.

Trip generation rates are based upon traffic information and counts that have been submitted to the Institute of Transportation Engineers (ITE) over the years and programmed into the ITE computer. The material is continually updated and is the data source for all traffic studies. The basic peak hour trip rates used by Wilbur Smith & Associates for the Marina Zoning are based upon numerous traffic counts in the ITE computer, supplemented by data in the consultant's files from a number of developments. The rates are as follows:

Types of Units	Average Trips Per Unit
Single-Family (SF)	.55
Low-Density Apartment (LDA)	.40
Medium-Density Apartment (MDA)	.20

Applying these rates to the Marina Zoning 2,400 units (±2,400) and the ±1,050 units to be developed on zoned parcels results in a figure of approximately 870 trips, including 100-trip deduction because of commercial development. Traffic counts conducted by the consultant and others show that approximately 80% of these 870 trips go down Kalanianaole Highway. The other 20% are internal Hawaii Kai trips (taking children to school, going to work in Hawaii Kai, etc.) or windward. Thus, the figure of 770 cars.

The best illustration of the basic accuracy of this figure is to check the historical driving patterns of Hawaii Kai. At the beginning of this year, the following types and number of units existed in Hawaii Kai:

Unit Type	Units
SF	5,754
LDA	1,333
MDA	1,207
Total	8,294

The theoretical amount of trips (vehicles) to be generated using the above listed rates are as follows:

Unit Type	Trips
SF	3,165 vehicles
LDA	533
MDA	241
Total	3,939 vehicles

Using the same 80% figure, 3,151 of these vehicles would travel on Kalanianaole Highway from Hawaii Kai at Kawaihae Street without the commercial expansion. The actual number of vehicles traveling down Kalanianaole Highway during the school year and during the morning peak hour is 2,800. Therefore, the trip factors that the

consultant is using for the Marina Zoning may well be overstating the trips that will be generated.

One final note. The Hawaii Kai Transportation Management Study indicates that the entire program will cost in excess of $4 million dollars. It does not indicate how much of this Kaiser will contribute. The reason for this is that discussions are being held regarding the various contributions of Kaiser, the State and the City to the program. Please remember, this is a State highway. However, Kaiser intends to contribute substantially.

Very truly yours,

Dan Davidson
Manager, Land Use

DD:scy

cc: Board Members

HAWAII KAI

"Hawaii by the sea
where a weekend is all week long!"

August 20, 1985

Reviewed BY QHK Xcd 8/21/85

Mr. Quincy H. Kaneshiro, Chair
Neighborhood Board No. 1
P. O. Box 25804
Honolulu, Hawaii 96825

Dear Quincy:

Subject: HAWAII KAI TSM STUDY - REVISED PARAGRAPH

So as to give you the best information that we can, enclosed is a replacement page 2 of my August 15th letter to you with the first full paragraph corrected. The minor corrections give you the trip generation figures at Kawaihae Street.

If you have any questions, please call me.

Very truly yours,

Dan Davidson
Manager, Land Use

DD:as

Enclosure

cc w/enc.: Board Members

KAISER DEVELOPMENT COMPANY
7120 KALANIANAOLE HIGHWAY P.O. BOX 25007 HONOLULU, HAWAII 96825 TELEPHONE 396-2331

Reviewed BY QHK Xcd 8/21/85

Types of Units	Average Trips Per Unit
Single-Family (SF)	.55
Low-Density Apartment (LDA)	.40
Medium-Density Apartment (MDA)	.20

Applying these rates to the Marina Zoning 2,400 units (±2,400) and the ±1,050 units to be developed on zoned parcels results in a figure of approximately 1,130 trips. Traffic counts conducted by the consultant and others show that approximately 79%, or 890 trips, of these trips would go down Kalanianaole Highway. The other 20% are internal Hawaii Kai trips (taking children to school, going to work in Hawaii Kai, etc.). From this 890 trip figure, an additional 100 trips are deducted because of the jobs that will be created by additional commercial development; thus, the figure of 790 cars.

The best illustration of the basic accuracy of this figure is to check the historical driving patterns of Hawaii Kai. At the beginning of this year, the following types and number of units existed in Hawaii Kai:

Unit Type	Units
SF	5,754
LDA	1,333
MDA	1,207
Total	8,294

The theoretical amount of trips (vehicles) to be generated using the above listed rates are as follows:

Unit Type	Trips
SF	3,165 vehicles
LDA	533
MDA	241
Total	3,939 vehicles

Using the same 80% figure, 3,151 of these vehicles would travel on Kalanianaole Highway from Hawaii Kai at Kawaihae Street without the commercial expansion. The actual number of vehicles traveling down Kalanianaole Highway during the school year and during the morning peak hour is 2,800. Therefore, the trip factors that the

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

July 1, 1985

Reviewed By Tue 7/3/85

Mr. Quincy H. Kaneshiro
612 Kapaia Street
Honolulu, Hawaii 96825

Dear Mr. Kaneshiro:

We are in receipt of your comments on the Environmental Impact Statement Preparation Notice dated June 3, 1985 and we respond as follows:

We share your concerns over the traffic situation at Hawaii Kai and Kalanianaole Highway and concur in your evaluation that the improvements are long overdue. Historically, the traffic improvements have not kept pace with the increased development in the East Honolulu District and this has led to nearly maximum capacity on the traffic corridor into Honolulu.

We appreciate the traffic mitigation measures identified in your letter that you indicate have already been discussed at various meetings but not yet implemented. Three of the four measures (adjustments to the timing at traffic lights and banning of left turns at certain intersections and implementing the jug handle left turn for Hawaii Loa Ridge) can be considered ongoing operational modifications and are not really dependent on the Marina Zoning project. These are suggestions that the Department of Transportation could review and implement at any time. We have forwarded a copy of your letter to the State Department of Transportation and the City & County Department of Transportation Services for their review.

The Transportation Study prepared for the Marina Zoning project identifies a number of roadway modifications to accommodate future traffic increases. One of these modifications is the remaining measure identified in your letter, the pedestrian bridge fronting Kalani High School.

The Transportation Management Study proposes that the traffic mitigation measures for the Marina Zoning (both roadway modifications and rideshare measures) be phased with development such that all increase of traffic will be accommodated. A proposed implementation schedule is included in the Transportation study that will be appended to the draft EIS. It must be pointed out, however, that prohibiting development in Hawaii Kai until highway impacts are made is not considered an acceptable alternative by the developer.

Thank you for your comments and we look forward to hearing from you on the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL SUITE 100 • P. O. BOX 25 • HONOLULU HAWAII 96810 • TELEPHONE

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

September 3, 1985

Mr. Quincy H. Kaneshiro, Chairperson
Hawaii Kai Neighborhood Board No. 1
P.O. Box 25804
Honolulu, Hawaii 96825

Dear Mr. Kaneshiro:

We are in receipt of the comments dated August 21, 1985 and provided by your Neighborhood Board No. 1 on the draft EIS for the proposed Marina Zoning project; we respond in the following:

The availability of EIS documents for review by community groups like yours is governed and administered by the Rules & Regulations of the Environmental Quality Commission in terms of distribution. We regret that your entire Board did not have single copies for each member to review; as you have stated, the lack of adequate copies is a subject for discussion by your governing Neighborhood Commission and the State Environmental Quality Commission.

1,2
& 3. Our response to the concerns on Traffic as expressed by A.W. De Paul, Jr. Chairman of the Transportation Committee has been prepared by Mr. Terry Brothers of Wilbur Smith & Associates.

Hawaii Kai has always sought a mix of different types of housing units. Most of the zoned, but unbuilt units in Hawaii Kai are single-family units while the multi-family units are planned for the Marina Zoning area. The long-term planning for Hawaii Kai, since the mid-1960's, has anticipated multi-family development in the Marina area; the Marina developments complete these long-term planning objectives.

Verbal statements at the July 1985 Neighborhood Board meeting certainly were not intended to indicate major changes in demographic characteristics, or that this future population will not generate traffic. As discussed in item 4 below, the smaller multi-family units with fewer bedrooms tend to reach a different market than single-family development. The demographics and trip-making characteristics of the persons that will be attracted to the Marina Zoning units are not anticipated to differ much from those characteristics of persons now living in the over 2,500 multi-family units that exist in Hawaii Kai. The quality and desirability of Hawaii Kai will be maintained.

4. The Transportation Management Study (Appendix C) provides a realistic assessment of traffic generation and diversion to rideshare travel modes, and does not attempt to provide a overly conservative or optimistic scenario. The study sets forth a practical program of rideshare and roadway modifications which are implementable since the measures are

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largely independent of other transportation projects and programs. Although not included within Appendix C, a series of additional or alternative rideshare and roadway projects were identified as a contingency actions. The following responses are offered to the individual comments:

a) The trip generation factors for the single-family, low density multi-family, and high density multi-family developments are representative of the travel characteristics of present Hawaii Kai residents. To test this, the rates were first applied to existing Hawaii Kai development, with the resultant projections then compared to observed morning peak hour traffic leaving the community. The present dwelling units, morning peak hour trip rates, and total estimated trips are as follows:

Unit Type	Units	Average Trip Rate per Unit	Estimated Trips Leaving Dwellings In Morning Peak Hour
Single Family	5,754	.55	3,165
Low Density Multi-Family	1,333	.40	533
Medium Density Multi-Family	1,207	.20	241
TOTAL	8,294		3,939

Past studies have found that 80 percent of these morning peak hour vehicles would travel towards town on Kalanianaole Highway, based on existing levels of Hawaii Kai commercial development. Applying the 80 percent figure results in an estimated 3,151 Hawaii Kai vehicles travelling towards Honolulu during the morning peak hour period.

Counts taken during the school year found that the actual number travelling inbound on Kalanianaole Highway from Hawaii amount to 2,800 vehicles in the peak hour. Therefore, the trip rates approximate or slightly overstate the actual trip-making characteristics of Hawaii residents.

The trip rate which seems to be under question is the .20 exiting trips per unit for medium density multi-family units, primarily since it is considerably lower than the other rates. This lower rate reflects the household characteristics of persons who tend to live in these higher density projects, which generally range from 5 to 15 floors in Hawaii Kai. Residents of these units, because of smaller average unit size, fewer bedrooms, and lower costs, tend to be older couples, single persons living alone, or young couples who seek to live in a

prime community environment, but who cannot afford the higher-priced single family units. Each of these groups tend to have smaller family size, lower average car ownership, and lower trip-making characteristics.

To check the reasonability of the .20 rate for this type of unit, traffic counts were made at several of the present medium density projects during the morning peak period on Wednesday, August 28, 1985. The total number of vehicle trips generated by these Hawaii Kai projects were tabulated for two "peak hour" periods in the morning. The "roadway peak hour" represents the trip exiting between 6:30 and 7:30 A.M. and which contribute to the highest one-hour period traffic flow on Kalanianaole Highway. The "building peak hour" represents maximum number of vehicles generated in any one hour period, which tended to trail the roadway peak hour by one-half hour. Note that the counts included both vehicles exiting the building parking spaces and those persons who walked from the building and drive away from an on-street parking space. The survey results and resultant trip rates are as follows:

Multi Family Project	Units	Roadway Peak Hour: Exiting Vehicles	Roadway Peak Hour: Rate Per Unit	Building Peak Hour: Exiting Vehicles	Building Peak Hour: Rate Per Unit
Mauna Luan	434	51	.12	89	.20
Heritage House	136	25	.18	29	.21
The Plaza	147	26	.18	26	.18
Total	717	102	.14	144	.20

The buildings generated fewer trips — .14 per unit — during the "roadway peak hour" than the .20 trips per unit used in the Kalanianaole Highway traffic forecast. The .20 trips per unit rate during the "building peak hour" equals the rate used in the forecasts.

These counts reflect traffic generation when school is not in session. When school starts, some people from the projects may leave earlier in order to drop children off at school or because with increased congestion on school days. Several additional trips may be made especially for school purposes, although the low proportion of units with school age children will likely result in little difference in the number of trips. We expect that the "roadway peak hour" trips will increase once school starts, with the trip rate remaining within the .14 to .20 trips per unit range. A follow-up count will be made several weeks after school starts to identify the impact of school days on peak hour travel.

b. The increased commercial development will create additional employment opportunities within Hawaii Kai. The study bases traffic estimates on 45 percent of the employees residing in Hawaii Kai and 55 percent being attracted from outside of Hawaii Kai. These assumptions reduce morning inbound peak direction traffic by 100 vehicles and increase the traffice travelling Koko Head on Kalanianaole Highway by 150 vehicles.

During the afternoon peak hour, the commercial development would reduce both peak and off-peak direction traffic, by 200 and 100 vehicles, respectively. The afternoon peak hour changes reflect both the employment impacts and a reduction in trips made by Hawaii Kai residents to other commercial areas for shopping, dinner or personal business. These changes reflect the anticipated composition of the commercial development, which includes new types of retail businesses and additional retailers not now located within Hawaii Kai.

c. The proposed ridesharing program is intended to reduce the proportion of Hawaii Kai residents travelling inbound on Kalanianaole Highway during the morning peak hour from 54 percent drivers/46 percent passengers (cars, vans and buses) to 50 percent each. The study has attempted to make a realistic appraisal of rideshare program usage and effectiveness as possible.

1) The estimated effectiveness of the ridesharing measures have been based on Honolulu experience where similar services are available. For example, use of the proposes express bus service to Waikiki, Ala Moana and Kapiolani areas was based on the number of Hawaii Kai residents employed in those areas, and the proportion of Hawaii Kai residents who work Downtown and the use the similar existing express services to Downtown. For purposes of conservatism, the participation rate was halved to reflect the more diverse work hours in the Waikiki-Ala Moana areas.

Where similar programs are not available in Honolulu, such as the free bus passes, experiences where drawn from programs on the Mainland. In these cases, resident participation rates were used that are reflective of low-end to average to low-end rates of participation.

2) The proposed program and level of effort recognizes the difficulty in attracting additional residents to use of rideshare modes. This has resulted in the proposal of a broad program of measures to address the particular needs and preferences of residents and provide types of incentives and services not currently available to Hawaii Kai, but for which there appears a need.

- The program measures will provide premium public transportation services to employment areas not served at present.

- The program includes a transportation coordinator who will actively contact existing and new residents to solicit their participation in the program and to tailor services to resident preferences and needs.

- Resources can be shifted between measures if one proves less attractive and another more attractive.

- Backup measures, which are not described in the study report, have been identified for addition to the program if necessary.

3. Use of a Transportation Manager is estimated to attract 50 additional rideshare riders, and reduce automobile travel by 35 vehicle trips. These changes reflect estimated effectiveness of a Manager in organizing carpools among existing and/or new Hawaii Kai residents. These carpool formations are separate from the other rideshare measures and represent a 3 percent increase to the present number of carpool groups (school and work). This reflects the Manager's role in actively identifying and assisting workers and parents to form carpools, and is predicated on 3 to 6.7 percent increases realized in Mainland programs.

5 & 6. Kalanianaole Highway is currently "at saturation" at Kalaniiki Street during the morning peak hour and motorists experiences congested conditions and delays during both morning and evening peak hours.

The proposed transportation management program would use a series of ridesharing measures and spot roadway modifications to provide sufficient capacity to accommodate the additional development. The program is not intended to fully offset the traffic increases and maintain or improve current traffic flow conditions, nor to replace the State DOT project. The purpose is to provide interim measures until the State DOT can implement its Kalanianaole Highway improvements project.

7. The Transportation Management Plan includes development of a park-and-ride facility adjacent to Keahole Street across from the Hawaii Kai Towne Center. Most if not all of the additional public transit services will probably operate from this facility. Any additional bus operations in the existing residential areas will occur on Lunalilo Home Road makai of Wailua Street and Hawaii Kai Drive Ewa of Keahole Street. These two streets already accommodate most of the bus routes and are also major traffic arterials.

8. The State has determined that the State highway reserve is not needed as a part of the State Highway System. Portions of this reserve are now programmed for development, including a portion of the Kuliouou 2 + 3 parcel. The Marina 8 parcel, on the other hand, still retains a road

setback and development will not occur in this setback until decisions are made regarding future development in East Hawaii Kai. Within the Marina Zoning area, provision has been made for an arterial roadway whether through use of the existing roadway system, including potential widening and new alignments, or through the use of a portion of the former highway reserve.

9. The transportation management plan couples conventional roadway improvements with a series of rideshare measures, all of which have been successfully implemented in other major cities. Most of these rideshare measures are now routinely implemented as part of major developments in the more congested mainland cities.

   Trip generation rates and rideshare participation rates have been based on the best available information for similar types of developments and programs. Where possible, these have been validated using information for similar programs in Honolulu.

   Contingency measures, both additional rideshare measures and further roadway modifications, are available where necessary to replace or offset a measure which proves ineffective.

10. Neighborhood Board No. 1 has refused to adopt either 10.a. or 10.c. as its position. It did adopt 10.b. in the context of recommending aproval of the Marina Zoning application.

    The developer has advised us that they are eager to work with the Hawaii Kai Community on expediting the Kalanianaole Highway widening project and they have committed this to the Neighborhood Board No. 1.

In conclusion, the developer has indicated that there is a great need to collectively solve the traffic problems that face existing residents of Hawaii Kai as well as future commuters when this project is under development. This will involve not only Hawaii Kai and the appropriate governmental agencies, but the community groups such as Neighborhood Board No. 1 as well.

Thank you for your comments and continuing concern.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

Koko Isle
315 Koko Isle Circle, Honolulu, Hi 96825
(808) 395 3355

August 22, 1985

Mr. John P. Whalen, Director
Dept. of Land Utilization, C & C Hnl.
650 South King Street
Honolulu, Hawai. 96813

Subject: A Draft EIS for Hawaii Kai Marina Zoning submitted by Enviromental Communications, Inc. Enviornmental Consultants for the Kaiser Development Company dtd July 1985.

Dear Mr. Whalen,

The July 1988 "Environmental Impact Amendment for Hawaii Kai Marina Zone" has been reviewed by the Board of Koko Isle Home Owners Association.

Three major areas in this study have direct or an indirect effect on our people. The island is down wind of the construction area.

1). Dust- need more input on the reduction and air dust control during the 6-10 year construction period.

2). Marina- need complete input statement on the control of the waterfront, its usage, and its contribution to the marina maintenance fund.

3). Hawaii Kai arterial reserve from Kuhale to Hawaii Kai to Keiha to Lunalilo Home Road. The roadway should be built now to its maximum, and lined up for better connections at all points or entre by each subdivision.

We believe in the right for Kaiser to continue the development for Hawaii Kai as set forth by Henry Kaiser. Kaiser has been responsive to the public concern and we know they will act in good faith on our above three (3) areas of concern.

For the Board of Directors;

Bill Edwards
President

AUG 26 1985

BE/jp

cc Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

NHB #1

Mr. Stafford Morse
419 Koko Isle Cir Dr.

Welcome Fawcett
City Council
City & County of Honolulu
Honolulu, Hawaii 96813

APPENDIX D

AIR QUALITY STUDY

FOR THE

MARINA ZONING REQUESTS

HAWAII KAI

OAHU, HAWAII

Prepared by

Barry D. Root
Kaneohe, Hawaii

May 1, 1985

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FIGURES

TABLES

1. PROJECT DESCRIPTION

Two groups of improvements are planned or proposed for the existing Hawaii Kai development on eastern Oahu. The first group includes projects which have been previously zoned for residential use by the City and County of Honolulu. This group includes vancant residentially zoned lands, tracts under construction, and constructed but unsold units such as the Commodore condominium. The second group, referred to in this study as the Marina Zoning projects, includes projects for which Kaiser Development Company is now requesting approval of residential zoning in order to implement the overall Hawaii Kai development plan. Location of these proposed additional development areas within Hawaii Kai is shown in Figure 1. For purposes of estimating the traffic generation and air quality impact of the proposed Marina Zoning projects, these developments are assumed to contain 2,400 multi-family dwelling units.

The purpose of this study is to describe existing ambient air quality in the project area, to estimate and evaluate the impact of any increase in short or long term air pollutant concentrations resulting from actions related to the proposed project, and to suggest potential mitigative measures that might be employed to alleviate any adverse air quality impacts that could be directly or indirectly attributerd to the project as proposed.

2. AIR QUALITY STANDARDS

State of Hawaii and National Ambient Air Quality Standards (AQS) have been established for six classes of pollutants as shown in Table 1. An AQS is a pollutant concentration level not to be exceeded over a specified sampling period which varies for each pollutant depending upon the type of exposure necessary to cause adverse effects. Each of the regulated pollutants has the potential to cause some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration.

National AQS have been divided into primary and secondary levels. Primary AQS are designerd to prevent adverse health impacts while secondary AQS refer to welfare impacts such as decreased visibility, diminished comfort levels, damage to vegetation, animals or property, or a reduction in the overall aesthetic quality of the atmosphere. State of Hawaii AQS have been set at a single level which is in most cases significantly more stringent than the lowest comparable national limit.

The State of Hawaii Department of Health has proposed that Hawaii State AQS for particulates and sulfur dioxide be changed to match Federal limits. Public hearings were held on the proposed changes in May, 1984, but to date these changes have not been made official.

3. PRESENT AIR QUALITY

There are no ambient air quality monitoring stations within the immediate vicinity of Hawaii Kai. Under prevailing wind conditions there is no industrial activity upwind for thousands of miles and it is reasonable to assume that present air quality is quite good. The only significant sources of man-made air pollution in the area are motor vehicles traveling within the Hawaii Kai development or on nearby Kalanianaole Highway. There is no agricultural activity requiring open field burning on east Oahu.

Natural air pollutant producers which could affect Hawaii Kai air quality include the ocean (sea spray), plants (aero-allergens), dust, and perhaps a distant volcanic eruption on the Island of Hawaii. Concentrations of air pollutants from these kinds of sources should be fairly uniform for most Oahu locations.

The nearest long term air pollution monitoring station to Hawaii Kai is located in Waimanalo on the other side of the Koolau Mountains, and only particulates are measured at that location. For the past 15 years, 24 hour and annual averages of particulate measurements at Waimanalo have been running about half the allowable State of Hawaii AQS and in fact, the station location was specifically chosen to provide an estimate of background particulate levels in the air arriving over Oahu.

4. DIRECT AIR QUALITY IMPACT OF PROJECT CONSTRUCTION

During the site preparation and construction phases of this project it is inevitable that a certain amount of fugitive dust will be generated. Field measurements of such emissions from apartment and shopping center construction projects has yielded an estimated emission rate of 1.2 tons of dust per acre of construction per month of activity. This figure assumes medium level activity in a semi-arid climate with a moderate soil silt content. Actual emissions of fugitive dust from this project can be expected to vary daily depending upon the amount of activity and the moisture content of exposed soil in work areas.

One major generator of fugitive dust is heavy construction equipment moving over unpaved roadways. This problem can be substantially mitigated by completing and paving roadways and parking areas as early in the development process as possible. Because most construction will be taking place in close proximity to existing residential areas, dust control will have to be an item of special concern throughout the construction phase of the project.

Heavy equipment at construction sites will also emit some air pollutants in the form of engine exhausts. The largest equipment is usually diesel-powered. Carbon monoxide emissions for large diesel engines are generally about equal to those from a single automobile, but nitrogen dioxide emissions from this type of engine can be quite high. Fortunately, nitrogen dioxide emissions from other sources in the area should be relatively low and the overall impact of pollutant emissions from construction equipment should be minor compared to levels generated on major roadways nearby.

5. AIR QUALITY IMPACT OF INCREASED ENERGY UTILIZATION

Estimating about 1,000 square feet average size for the 2,400 multifamily units now planned for the marina zoning project yields a total of 2.4 million square feet of floor space. Energy consupmtion rates at the power plant for all-electric apartments are about 72,000 BTU per square foot. Thus this project would require about 173 billion BTU of energy per year at the power plant, or about 30,000 barrels of oil if the demand were to be met totally by burning fuel oil.

The major impact of burning fuel oil to meet this increased energy demand will be increased levels of sulfur dioxide and particulates in the vicinity of existing power plants, primarily the Kahe Power Plant on the Waianae coast.

This energy requirement could be reduced substantially by the installation of solar water heating on all new units. It is also possible that the new demand could be met by means other than burning fuel oil. Generation of electrical energy by wind power and by using ocean thermal energy conversion are two such possibilities.

6. INDIRECT AIR QUALITY IMPACT OF INCREASED TRAFFIC

Once construction is completed the proposed project will not in itself constitute a major direct source of air pollutants. By serving as an attraction for increased motor vehicle traffic in the area, however, the project must be considered to be a significant indirect air pollution source.

Motor vehicles, especially those with gasoline-powered engines, are prodigious emitters of carbon monoxide. Motor vehicles also emit some nitrogen dioxide and those burning fuel wihich contains lead as an additive contribute some lead particles to the atmosphere as well. The major control measure designed to limit lead emissions is a Federal law requiring the use of unleaded fulel in most new automobiles. As older cars are removed from the vehicle fleet lead emissions should continue to fall. In fact, the Federal Environmental Protection Agency is currently advocating that lead be removed frpom all automobile fuel as soon as possible.

Federal control regulations also call for increased efficiency in removing carbon monoxide and nitrogen dioxide from vehicle exhausts. By 1995 carbon monoxide emissions from the vehicle fleet then operating are mandated to be little more than half the amounts now emitted.

7. CARBON MONOXIDE DIFFUSION MODELING

In order to evaluate the air quality impact of increased traffic and decreasing emission rates per vehicle in the context of the proposed Marina Zoning projects it was necessary to carry out a detailed carbon monoxide modeling study. The study was designed to yield carbon monoxide concentration values which could be compared directly to allowable State and National Ambient Air Quality Standards.

Two critical receptor sites were selected for micro analysis. Site 1 is on the mauka side of Kalanianaole Highway at the Kalaniiki intersection close to the existing bus stop. This intersection was selected for analysis because the traffic management study for the project identified it as the major bottleneck to peak morning traffic flow along Kalanianaole Highway, thereby making it the location most impacted by any increase in traffic volume generated by the proposed Marina Zoning projects. The particular position of site 1 with respect to the intersection was selected because that spot would be most likely to have the highest levels of automobile-generated air pollutants, specifically carbon monoxide, under worst case meteorological diffusion conditions.

Site 2 is located on the makai side of Kalaianaole Highway near the East Halemaumau Street intersection, where the most significant evening peak hour traffic congestion is likely to occur. The locations of both sites are indicated on Figure 1.

Expected worst case carbon monoxide concentrations at these receptor sites were computed for the present case (1984), and for study years 1994 and 2004. Future year computations were made for traffic conditions with and without the proposed Marina Zoning projects and for traffic conditions that would be expected to prevail after implementation of major mitigative measures suggested in the traffic management study for the project.

At present peak hour for morning traffic on Kalanianaole Highway is from 0645 to 0745, while the peak evening hour is from 1645 to 1745. Existing traffic volumes and forecast volumes with and without the proposed project along with the traffic volume impact of suggested mitigative measures are presented in the traffic management study for the project for 1984 and 1994. Volumes for 2004 are based on a forecast 10 percent increase in traffic volumes not associated with Hawaii Kai. It is assumed that the Hawaii Kai Master Development Plan will be totally implemented and that all units will be occupied by 1994.

The existing peak hour vehicle mix along Kalanianaole Highway is assumed to be 74% gasoline-powered automobiles, 14% light duty gasoline-powered trucks and vans, 1% heavy duty gasoline-powered vehicles, 5% diesel-powered automobiles, 1% diesel-powered light duty trucks, 4% diesel-powered trucks and buses, and 1% motorcycles. The same vehicle mix was assumed for 1994 and 2004 emission rate calculations.

There are signal lights controlling traffic flow at both intersections studied. Average vehicle speeds were assumed to be 5 mph upstream from red signal lights and 15 mph downstream from signals or turns. In the off peak and high occupancy vehicle (HOV) lanes of Kalanianaole Highway traffic was assumed to move at 25 mph in unimpeded flow. In the peak direction during morning rush hour the traffic was assumed to slow to a prevailing 10 mph in 1994 without considering either the Marina zoning project traffic or suggested rideshare and intersection improvements. As a worst case estimate peak direction traffic with the Marina Zoning project contribution added and no ridesharing or other improvements is projected to slow speeds to a prevailing 5 mph. Implementation of ridesharing is forecast to increase this speed to 10 mph, and adding a pedestrian overpass at Kalaniiki Street is projected to increase peak hour speeds to 15 mph.

For both morning and evening rush hour a prevailing temperature of 68 degrees F was assumed with 20% of vehicles operating in a 'cold start' mode. The EPA computer model MOBILE 2 was run using the above parameters to produce vehicular carbon monoxide emission estimates for each of the years studied.

The EPA computer model HIWAY 2 was used to calculate carbon monoxide concentrations at each of the selected critical receptor sites for each scenario studied. Stability category 4 was used for determining diffusion coefficients. This stability category represents the most stable (least favorable) atmospheric condition that is likely to exist in a suburban area such as this.

To simulate worst case wind conditions a uniform wind speed of one meter per second was assumed with the worst case wind direction for site 1 from the south southeast and that for site 2 from the northeast. For each receptor site concentrations were computed at a height of 1.5 meters to simulate levels that would exist within the normal human breathing zone. Background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were assumed to be zero.

Results of the peak hour carbon monoxide study are presented in Table 2. For site 1 worst case modeling estimates of morning peak hour carbon monoxide concentration are slightly above the allowable State of Hawaii one hour AQS for the current situation (1984). Traffic growth projections coupled with expected emission rate reductions for future years (1994 and 2004) result in little change to this situation assuming that there is no change to existing roadway configuration or present vehicle use rates even if the proposed Marina Zoning projects are not approved. If the Marina Zoning projects are approved with no change to existing roadway configuration and no change in current vehicle use rates then the worst case peak hour carbon monoxide concentrations are projected to increase to levwels substantially above the allowable State of Hawaii one hour AQS. The decreased traffic levels predicted to occur if ridesharing measures proposed in the traffic management study for the project are implemented along with the Marina Zoning projects result in projected decreases in carbon monoxide concentration to levels predicted for the case with no Marina Zoning project traffic. If the recommended pedestrian overpass at Kalaniiki Street is constructed, then the resultant increase in vehicle speeds and decreased signal waiting times in the peak hour direction on Kalanianaole Highway are projected to result in worst case carbon monoxide concentrations that are well below State of Hawaii limits.

For site 2 all projected worst case carbon monoxide concentrations are predicted to be within allowable State of Hawaii AQS with or without the increase in traffic from the proposed Marina Zoning projects. Implementing of the recommended ridesharing program is likely to offset the increased traffic levels from the Marina Zoning projects to the extent that carbon monoxide levels with both the proposed project and ridesharing will not be substantially different than those that would occur without the project.

Average one hour traffic volumes during the peak eight hour period are about 80 percent of the peak hour level. Eight hour carbon monoxide levels are estimated by multiplying the peak hourly values by this traffic volume ratio and a 'meteorological persistence factor' of 0.6 which is recommended in EPA modeling guidelines to account for the fact that meteorological dispersion conditions are more variable (and hence more favorable) over an eight hour period than they are for a one hour period. Multiplying projected peak hour carbon monoxide levels by this combined factor of about 0.5 will yield values that are about half those shown in Table 2. The State of Hawaii eight hour AQS for carbon monoxide is also one half the one hour standard. Thus all conclusions reached above regarding the State of Hawaii one hour standard will hold with respect to the eight hour standard as well.

All carbon monoxide concentrations calculated in the foregoing analysis are well within the less stringent National one and eight hour AQS whether the proposed Marina Zoning is approved or not and no matter which proposed roadway or ridesharing mitigation measures are implemented.

8. MITIGATIVE MEASURES

A. SHORT TERM

As previously indicated the only direct adverse air quality impact that the proposed project is likely to create is the emission of fugitive dust during construction. State of Hawaii regulations stipulate the control measures that are to be employed to reduce this type of emissions. Primary control consists of wetting down loose soil areas. An effective watering program can reduce particulate emission levels from construction sites by as much as 50 percent. Other control measures include good housekeeping on the jobsite and pavement or landscaping of bare soil areas as quickly as possible.

B. LONG TERM

Once completed, the proposed Marina Zoning projects are expected to have little direct impact on the air quality of the surrounding region. Indirect long term impacts in the form of increased air pollutant emissions from power plants serving new residences in the project area can be mitigated somewhat by planning and implementing solar energy design features to the maximum extent possible.

Other indirect long term air quality impacts are expected in those areas where traffic congestion can potentially be worsened by the addition of vehicles traveling to and from the proposed project. Project planners can do very little to reduce the emission levels of individual vehicles, but the traffic management study for the project describes in detail a multifaceted ridesharing program that could be implemented to significantly reduce traffic volumes along the main traffic corridor between Hawaii Kai and downtown Honolulu. The traffic management study also provides detailed descriptions of roadway improvements that could significantly alleviate traffic congestion in the vicinity of the major 'bottlenecks' along Kalanianaole Highway.

The State of Hawaii Department of Transportation has proposed additional road-widening measures to decrease traffic congestion along the Kalanianaole Highway corridor. Carbon monoxide modeling conducted as a part of this report indicates that the ridesharing and intersection-specific roadway improvements described in the traffic management study for the project would be adequate to ensure compliance with State and National air quality standards even if the proposed State projects never materialize.

Because the stringent national vehicular emissions reduction program now being pursued is entirely the product of eminently changeable government regulations, it is always possible that economic conditions or other factors could lead to an early abandonment of this program. If that were to occur, then the projected pollutant levels presented in this study could be too optimistic. On the other hand, this analysis did not consider the possibility that technological innovation may lead to new vehicular power systems that produce few or none of the currently regulated atmospheric pollutants.

In any case, this study indicates that currently proposed mitigative measures for traffic congestion along the Kalanianaole Highway corridor should be sufficient to meet existing air quality requirements as well.

9. SUMMARY

1. The proposed Marina Zoning projects involve development of remaining open lands in Hawaii Kai for residential use as part of the Master Development Plan for the area. Construction of about 2,400 multifamily units is planned.

2. Present air quality in the project area is estimated to be very good since there are no major contributing sources of air pollutant emissions other than vehicles traveling within the Hawaii Kai area or on Kalanianaole Highway nearby.

3. Except for short term dust emissions during the construction phase of the development, no significant direct air quality impacts are expected. Adequate control measures exist to limit the scope of this impact, but special care will have to be exerted to insure that previously developed residential areas are not subjected to excessive levels of particulate pollution from construction activities.

4. Indirect air quality impacts are expected to result from new demands for electrical energy. This impact is most likely to occur in the vicinity of existing power plants such as the Kahe Plant on the Waianae coast where increased levels of particulate and sulfur dioxide can be expected. Maximum use of solar energy designs in project development can at least partially mitigate the magnitude of this impact. New methods of generating electrical power such as wind or ocean thermal energy conversion may eventually also play a mitigative role in this regard.

5. Increased traffic generated by the Marina Zoning projects will increase emissions of carbon monoxide and nitrogen dioxide along Kalanianaole Highway leading to and from Hawaii Kai. Modeling of current and projected worst case concentrations of carbon monoxide at particularly congested intersections along this corridor has indicated that the most critical location will be the morning rush hour at the Kalaniiki Street intersection. Current worst case carbon monoxide concentrations at this intersection are likely to be higher than allowable State of Hawaii Air Quality Standards. Estimates for future years at this location show that some form of roadway improvement or change in vehicle use patterns will have to be implemented to allow vehicle flow to increase to the point where carbon monoxide standards can be met even if the Marina Zoning projects are not completed. Addition of projected traffic from the Marina Zoning projects will significantly exacerbate this problem unless concurrent mitigative measures are undertaken.

6. The traffic management study for the project proposes implementation of a multifaceted ridesharing program and construction of a pedestrian overpass at Kalaniiki Street. With these mitigative measures in place, worst case carbon monoxide concentrations along the Kalanianaole Highway corridor are projected to be lower than would be the case if neither the Marina Zoning projects nor associated traffic mitigation measures are undertaken.

7. The State of Hawaii is considering other road widening measures to improve traffic flow along the corridor leading to Hawaii Kai, but carbon monoxide modeling indicates that the mitigation measures proposed above could provide enough traffic congestion relief to meet existing carbon monoxide standards.

8. National ambient air quality standards for carbon monoxide concentration are much less stringent than State of Hawaii standards and none of the projected levels of carbon monoxide are higher than allowable National standards even if the Marina Zoning projects were to be approved with no concurrent implementation of mitigative measures.

REFERENCES

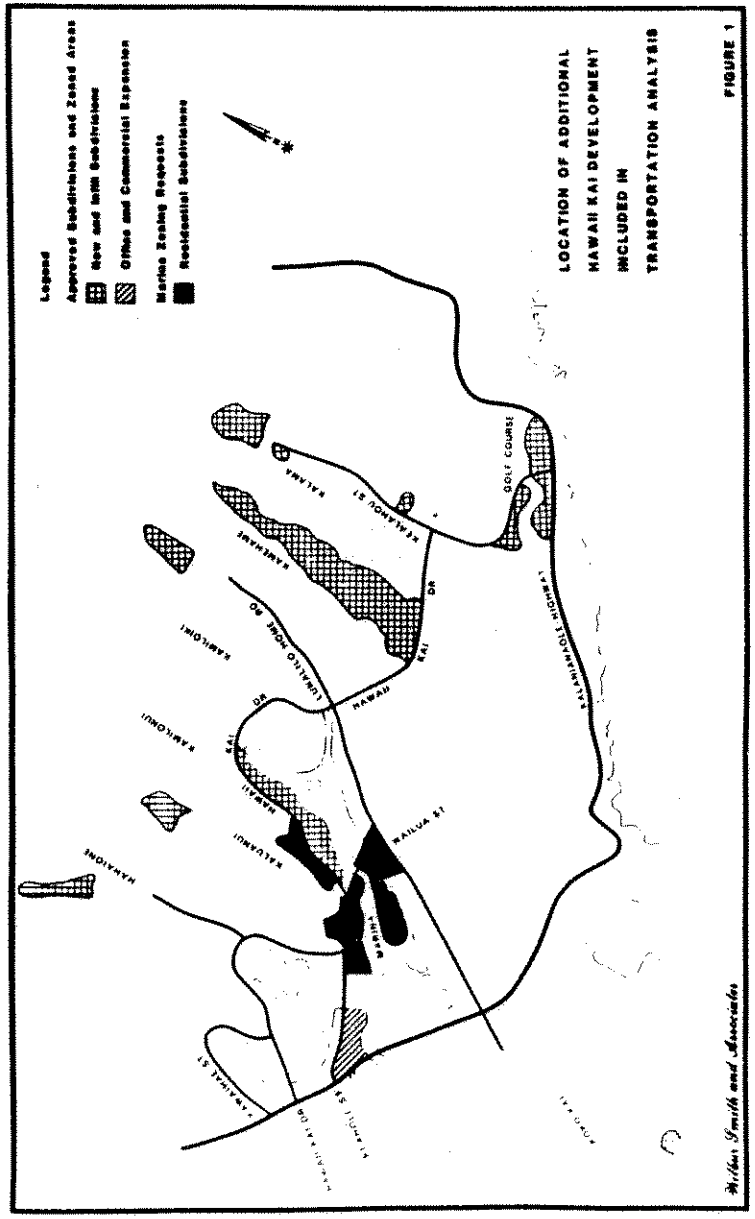
1. U.S. ENVIRONMNETAL PROTECTIOON AGENCY, User's Guide to MOBILE 2: Mobile Source Emissione Model, February, 1981.

2. U.S. ENVIRONMNETAL PROTECTION AGENCY, User's Guide to HIWAY 2, A Highway Air Pollution Model, May, 1980.

3. U.S. ENVIRONMENTAL PROTECTION AGENCY, Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources, January, 1975.

4. CALIFORNIA DEPARTMENT OF TRANSPORTATION, Energy and Transportation Systems, December, 1978.

5. WILBUR SMITH AND ASSOCIATES, Hawaii Kai Transportation Management Study, February, 1985.



LOCATION OF ADDITIONAL HAWAII KAI DEVELOPMENT INCLUDED IN TRANSPORTATION ANALYSIS

FIGURE 1

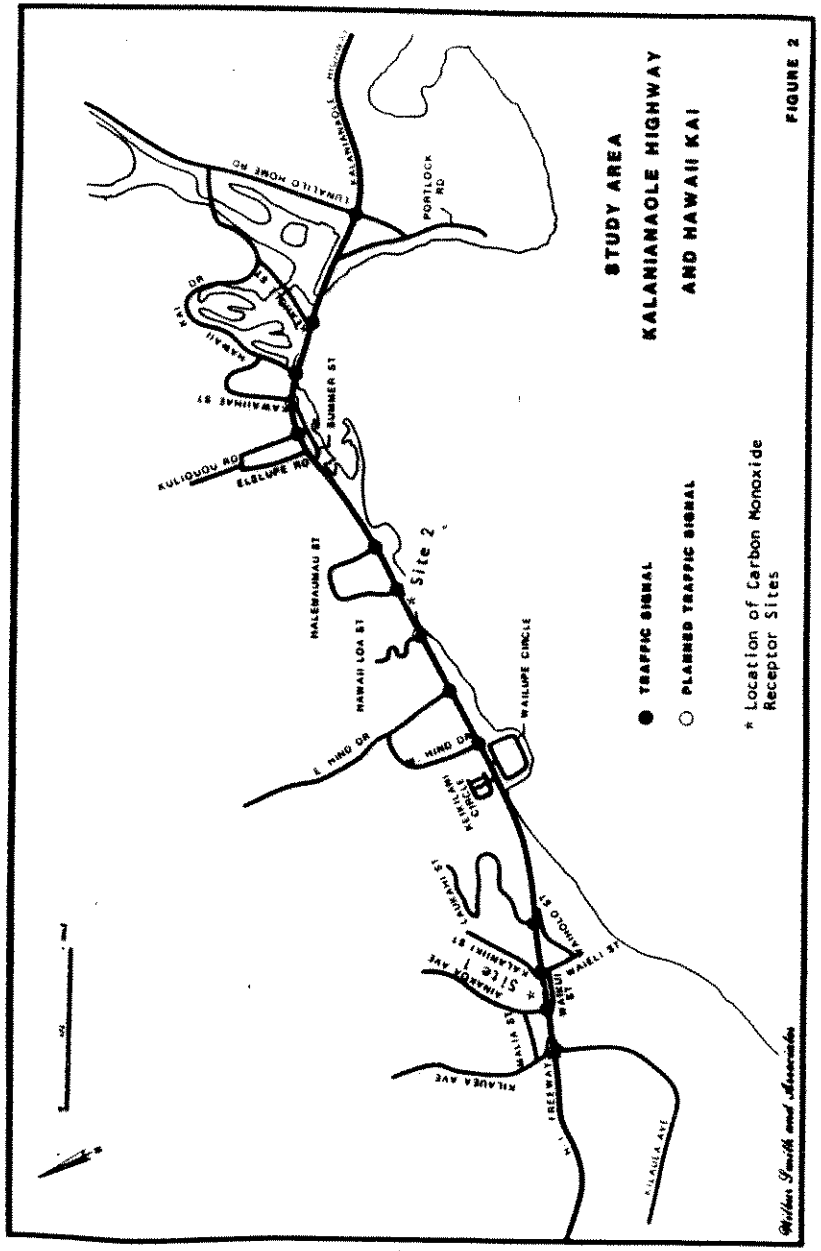


TABLE 1

SUMMARY OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS
(Micrograms per Cubic Meter)

		AMBIENT AIR QUALITY STANDARDS		
		NATIONAL		HAWAII
POLLUTANT	SAMPLING PERIOD	Primary	Secondary	
Particulates	Annual Geometric Mean	75	60	--
	Annual Arithmetic Mean	--	--	55
	Maximum 24-Hour Average	260	150	100
Sulfur Dioxide	Annual Arithmetic Mean	80	--	20
	Maximum 24-Hour Average	365	--	80
	Maximum 3-Hour Average	1300		400
Nitrogen Dioxide	Annual Arithmetic Mean	100		70
Ozone	Maximum 1-Hour Average	240		100
Carbon Monoxide	Maximum 8-Hour Average	10		5
	Maximum 1-Hour Average	40		10
Lead	Calendar Quarter	1.5		1.5

Notes: 1. Carbon monoxide standards are in milligrams per cubic meter.
2. National standards based on 40 CFR Part 50; Hawaii standards based on Title 11, Administrative Rules, Chapter 59.

TABLE 2

RESULTS OF PEAK HOUR CARBON MONOXIDE ANALYSIS
(Milligrams Per Cubic Meter)

SITE 1	1984	1994	2004
(Kalaniiki Street)			
Without Marina Zoning Projects	10.7	10.6	10.5
With Marina Zoning Projects and no mitigative measures		15.4	15.3
With Marina Zoning Projects and ridesharing program		10.7	10.6
With Marina Zoning Projects ridesharing program and pedestrian overpass		6.5	6.5
SITE 2			
(East Halemaumau Street)			
Without Marina Zoning Projects	7.8	4.4	4.1
With Marina Zoning Projects and no mitigative measures		4.6	4.3
With Marina Zoning Projects and ridesharing program		4.4	4.1

STATE OF HAWAII AQS:	10
NATIONAL AQS:	40

Note: See Figure 2 for location of receptor sites.

APPENDIX E

HAWAII KAI MARINA

TRAFFIC NOISE STUDY

Prepared for:

Environmental Communications, Inc.

by:

Y. Ebisu & Associates

April 18, 1985

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I. SUMMARY

The existing and future traffic noise levels in the vicinity of the Hawaii Kai Marina project were evaluated for their potential impact on present and future residences. The influence of predicted traffic volume increases from previously approved Hawaii Kai projects was included with the traffic volume increase associated with the current Marina project zoning request. Although the increases in future traffic noise are anticipated to be small, existing and future traffic noise levels are approaching or exceeding federal noise standards for residences.

In order to minimize traffic noise impacts on future Marina residents and to not preclude federal assistance on the project, future traffic noise levels were calculated and free-field traffic noise contours constructed. The locations of existing and planned residences in relationship to these noise contours were used to identify potential impact areas.

Overall, the majority of the proposed project residences will not be impacted by traffic noise. Existing residences which front Lunalilo Home Road will continue to experience high traffic noise levels with or without the project. Increases in future traffic noise will be small, and will be difficult to perceive on the existing high volume roadways in the project area as well as along Kalanianaole Highway.

Traffic noise mitigation measures which could be applied in this project are discussed. Because the project generated traffic noise is not expected to be significant when compared to existing plus non-project traffic noise, these mitigation measures would be applied primarily for minimizing traffic noise impacts on future Marina residents, and for compliance with FHA/HUD noise standards where required.

II. PURPOSE AND METHODOLOGY

The purpose of this noise study was to evaluate the predicted motor vehicle traffic noise associated with the proposed Hawaii Kai Marina developments. The scope of the noise study was limited to existing and future residential developments within Hawaii Kai which may be exposed to increased traffic noise as a result of the proposed developments. A specific objective was to determine setback requirements of proposed residential units for compliance with FHA/HUD noise standards.

Traffic noise predictions were performed using traffic data from the Wilbur Smith Report (Reference 1) and the Federal Highway Administration (FHWA) Noise Prediction Model (Reference 2). Traffic data used in the noise prediction model were: peak hour volumes; hourly variations in traffic volumes; average vehicle speeds; and estimates of traffic mix.

Areas affected by future traffic noise impacts were isolated by comparing future traffic noise levels with FHA/HUD noise standards (Reference 3). The relative contributions of non-project and project related traffic to the total noise levels were also indicated.

For residences within traffic noise impact areas, possible noise mitigation measures are described. These measures included the use of minimum setback distances for new construction, and the use of walls to attenuate traffic noise at existing and future residences.

III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

Two noise descriptors currently used to relate traffic noise levels to land use compatibility, and to assess environmental noise in general, are the Equivalent Noise Level (L_{eq}) and the Day-Night Average Sound Level (L_{dn}). Both of these descriptors are averages of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. In traffic noise evaluations, the averaging period for the L_{eq} descriptor is usually an hour, and more specifically, the peak hour of traffic. In all evaluations, the minimum averaging period for the L_{dn} descriptor is 24 hours (by definition). Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the L_{dn} descriptor.

Table 1 presents current federal standards and acceptability criteria for residential land uses exposed to various levels of environmental noise. As a general rule, noise levels of 55 L_{dn} or less occur in rural areas or urbanized areas which are shielded from high volume streets. Noise levels typical of communities on Oahu are shown in Figure 1. In urbanized areas, L_{dn} levels generally range from 55 to 65 L_{dn}, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 L_{dn}, and as high as 72 L_{dn} when the roadway is a high speed freeway. Due to noise shielding effects from intervening structures, residences which are located within interior lots are exposed to lower exterior noise levels of 55 L_{dn} or less.

TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION
(RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY-NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL[1] STANDARD
Minimal Exposure	Not Exceeding 55 L_{dn}	Not Exceeding 55 L_{eq}	Unconditionally Acceptable
Moderate Exposure	Above 55 L_{dn} But Not Above 65 L_{dn}	Above 55 L_{eq} But Not Above 65 L_{eq}	Acceptable[2]
Significant Exposure	Above 65 L_{dn} But Not Above 75 L_{dn}	Above 65 L_{eq} But Not Above 75 L_{eq}	Normally Unacceptable
Severe Exposure	Above 75 L_{dn}	Above 75 L_{eq}	Unacceptable

Note:

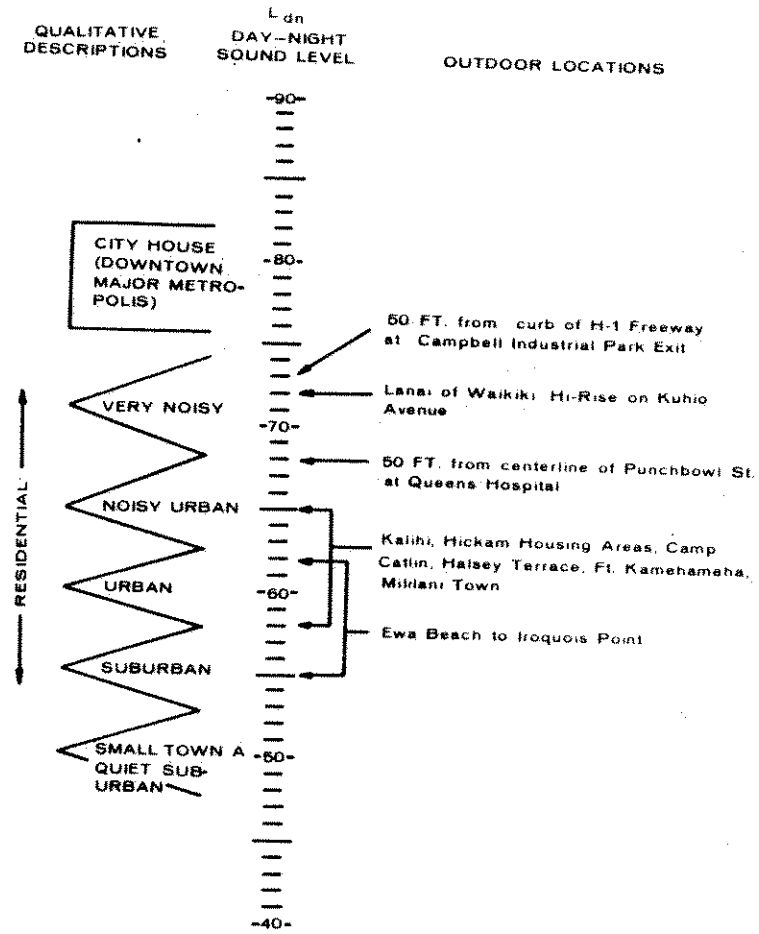
(1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the L_{eq} instead of the L_{dn} descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours.

Source: Reference 4.

FIGURE 1

RANGE OF EXTERIOR BACKGROUND AMBIENT NOISE LEVELS



For the purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 L_{dn} or lower is considered acceptable. This standard is applied nationally (see Reference 4), including Hawaii. Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 L_{dn} does not eliminate all risks of noise impacts. For these reasons, and as recommended in Reference 5, a lower level of 55 L_{dn} is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 L_{dn}, government agencies such as FHA/HUD and VA have selected 65 L_{dn} as a more appropriate regulatory standard.

IV. EXISTING TRAFFIC NOISE ENVIRONMENT

The existing traffic noise environment along the Hawaii Kai roadways which would service this project are in the "Moderate Exposure, Acceptable" and "Significant Exposure, Normally Unacceptable" categories. This condition is typical for residential subdivisions on Oahu where the first row of homes fronting a subdivision roadway are setback between 50 to 75 feet from the roadway's centerline (see Figure 1). Traffic noise levels along the first row of homes fronting a major roadway generally represent the worst case (or highest) levels for homes of a subdivision. Traffic noise levels at interior lots (second row of homes from the roadway, for example) are generally in the "Minimal to Moderate Exposure, Acceptable" category, with 5 to 10 L_{dn} lower noise levels resulting from shielding and distance effects. An exception occurs for mid- and high-rise structures which are not shielded from the roadway by intervening low-rise units.

Results of calculations of existing traffic noise levels along the six Hawaii Kai roadway sections of interest are shown in Tables 2 and 3. In the tables, Lunalilo Home Road and the Hawaii Kai Drive sections inland (mauka) of Wailua Street are indicated as toward the north. The section of Hawaii Kai Drive between Wailua and Keahole Streets is labeled as the middle section. The traffic volumes used for each roadway section represent averages of the intersection volumes contained in Reference 1. Average speed, vehicle mix (or classification), and hourly traffic variation data were estimated from Reference 6. The traffic noise levels shown in the tables only apply when unobstructed line-of-sight conditions exist to the roadways. These conditions would generally occur at the first row of homes fronting the roadway, within any open space or parking lot, and at the upper levels of a mid- or high-rise structure.

TABLE 2

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS
IN HAWAII KAI

LOCATION	SPEED (MPH)	VPH	**** HOURLY L_{eq} IN dB AT 50 FT ***** AUTO	MT	HT	ALL VEH
EXISTING PM PK. HR. TRAFFIC:						
Lunalilo Home Road (North)	30	1880	64.26	56.19	62.65	66.92
Lunalilo Home Road (South)	30	995	61.49	53.43	59.89	64.16
Wailua Street	35	1520	65.21	56.87	62.71	67.54
Hawaii Kai Drive (North)	35	390	59.30	50.96	56.80	61.63
Hawaii Kai Drive (Middle)	35	1620	65.49	57.15	62.99	67.82
Keahole Street	35	1435	64.96	56.62	62.46	67.29
1994 PM PK. HR. TRAFFIC:						
Lunalilo Home Road (North)	30	2570	65.61	57.55	64.01	68.28
Lunalilo Home Road (South)	30	1335	62.77	54.70	61.17	65.44
Wailua Street	30	2180	64.90	56.83	63.30	67.57
Hawaii Kai Drive (North)	30	890	61.01	52.94	59.41	63.68
Hawaii Kai Drive (Middle)	30	2580	65.63	57.57	64.03	68.30
Keahole Street	30	2460	65.42	57.36	63.82	68.09

Note: Assumed traffic mix of 98% Auto, 1% Medium Trucks, and 1% Heavy Vehicles

TABLE 3

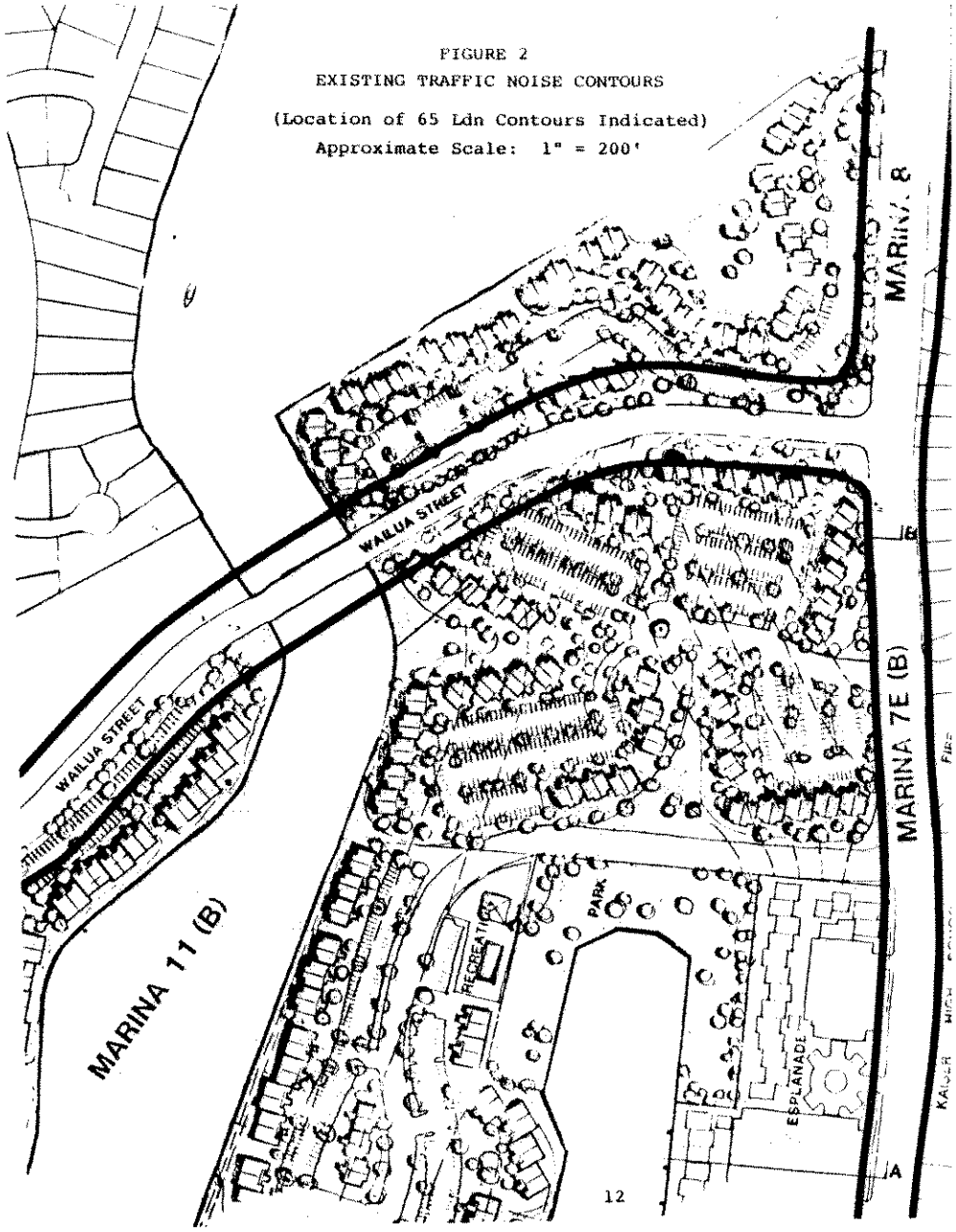
EXISTING AND FUTURE DISTANCES TO 65 AND 60 L_{dn} CONTOURS

STREET SECTION	65 L_{dn} SETBACK (FT) EXISTING	FUTURE	60 L_{dn} SETBACK (FT) EXISTING	FUTURE
Lunalilo Home Road (North)	67	83	144	179
Lunalilo Home Road (South)	44	53	95	114
Wailua Street	74	74	159	159
Hawaii Kai Drive (North)	30	41	65	88
Hawaii Kai Drive (Middle)	77	83	166	179
Keahole Street	71	80	153	172

NOTES: All setback distances are to the roadway centerlines. See Table 2 for traffic assumptions. L_{dn} assumed to be equal to PM Peak Hour L_{eq}.

Figure 2 depicts the location of the existing 65 L_{dn} traffic noise contours along the Hawaii Kai roadways of interest. It should be noted that the 65 L_{dn} contour lines shown represent the free-field noise condition, and do not take into account the excess sound attenuation effects of existing walls and other structures. However, from Figure 2, it can be concluded that existing homes which front Lunalilo Home Road are probably exposed to traffic noise levels above 65 L_{dn}. The setbacks of the proposed Marina homes are generally adequate for the existing traffic noise levels, since the majority of the proposed homes are located outside the existing 65 L_{dn} contours.

FIGURE 2
EXISTING TRAFFIC NOISE CONTOURS
(Location of 65 Ldn Contours Indicated)
Approximate Scale: 1" = 200'



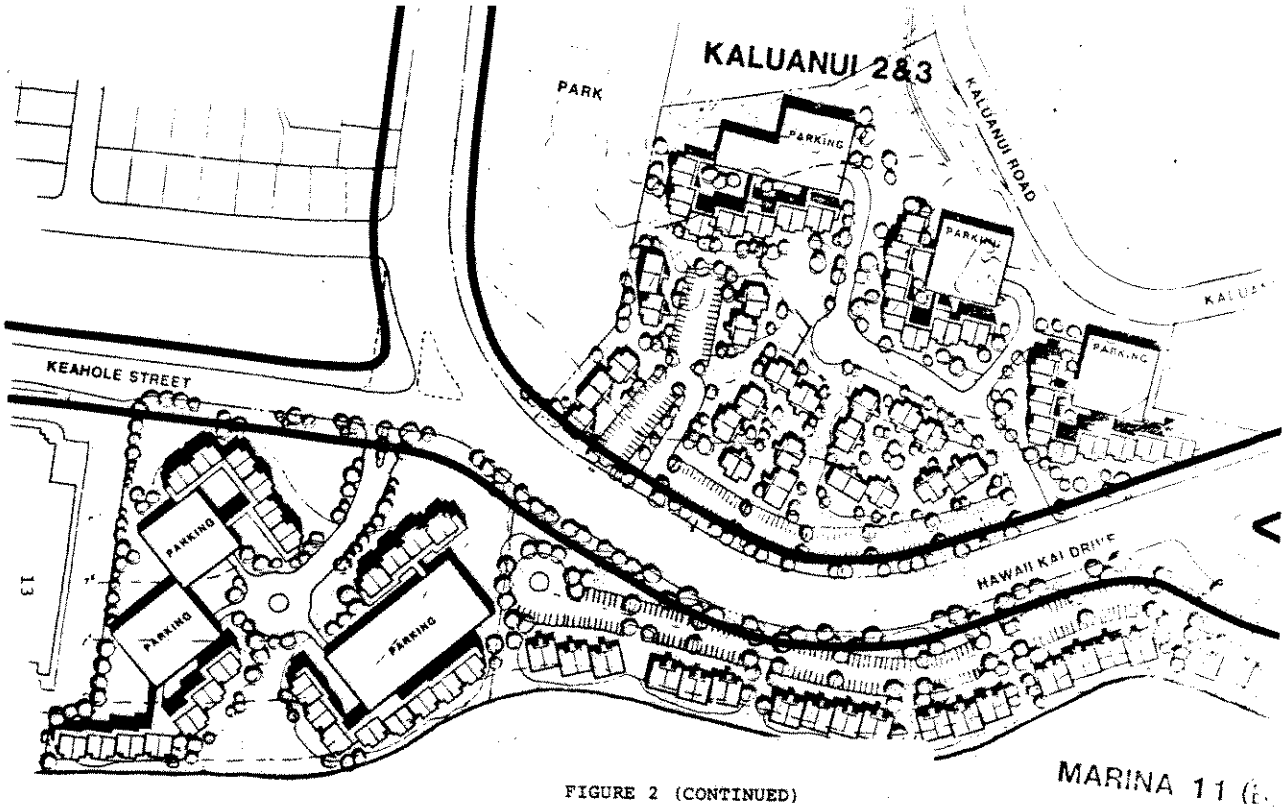


FIGURE 2 (CONTINUED)
EXISTING TRAFFIC NOISE CONTOURS
(Location of 65 Ldn Contours Indicated)
Approximate Scale: 1" = 200'

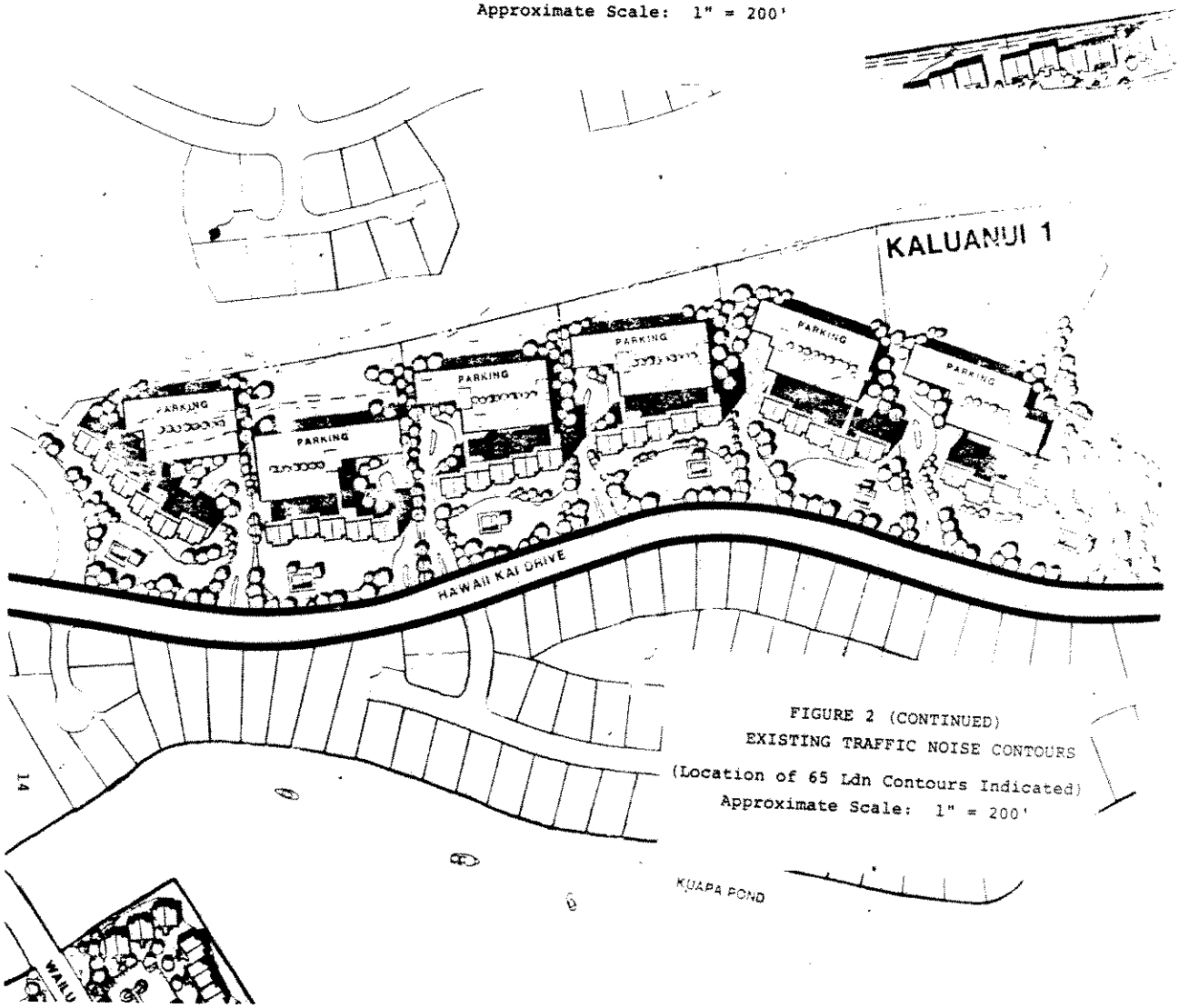


FIGURE 2 (CONTINUED)
EXISTING TRAFFIC NOISE CONTOURS
(Location of 65 Ldn Contours Indicated)
Approximate Scale: 1" = 200'

V. FUTURE TRAFFIC NOISE ENVIRONMENT

Predictions of future traffic noise levels were made using the Year 1994 traffic volume predictions of Reference 1 and supplemental traffic data of Reference 6. The results of the Year 1994 noise predictions are summarized in Tables 2 and 3, and resulting Year 1994 traffic noise contours are depicted in Figure 3. It should be noted that the future traffic noise levels represent the combined influence of previously approved projects within Hawaii Kai plus the current Marina zoning request.

From Table 4, traffic noise increases of 0.03 to 2.05 dB are predicted to occur between the current period and 1994. The largest increase of 2.05 dB is associated with a relatively low volume roadway (north section of Hawaii Kai Drive) whose future noise contribution will continue to be relatively low. For the higher volume roadway sections, whose 65 L_{dn} contours are beyond the 50 ft setback line, future traffic noise increases are predicted to range from 0.03 to 1.36 dB.

Table 3 depicts the future locations of the 65 and 60 L_{dn} contour lines under free-field conditions. As shown in Table 3, setback distances of 53 to 83 ft will be required to meet the FHA/HUD noise standard of 65 L_{dn} without incorporation of sound attenuation measures. An exception is along the north section of Hawaii Kai Drive, where a 41 ft setback distance will be required.

TABLE 4

TRAFFIC NOISE INCREASES ASSOCIATED WITH THE PROJECT

STREET SECTION	EXISTING L_{dn}	FUTURE L_{dn}	TOTAL INCREASE	PROJECT INCREASE
Lunalilo Home Road (North)	66.92	68.28	1.36	0.55
Lunalilo Home Road (South)	64.16	65.44	1.28	0.52
Wailua Street	67.54	67.57	0.03	0.01
Hawaii Kai Drive (North)	61.63	63.68	2.05	0.87
Hawaii Kai Drive (Middle)	67.82	68.30	0.48	0.18
Keahole Street	67.29	68.09	0.80	0.31

NOTE: All L_{dn} values calculated at 50 ft distance from roadway centerline.

The relationship of existing and future residences to the future 65 L_{dn} contours are shown in Figure 3. The majority of the planned units associated with the Marina zoning request have ample setback distances, and are outside the 65 L_{dn} contours. The number of existing residences along Lunalilo Home Road within the 65 L_{dn} contours is not expected to increase significantly, since the majority are currently within the existing 65 L_{dn} traffic noise contours.

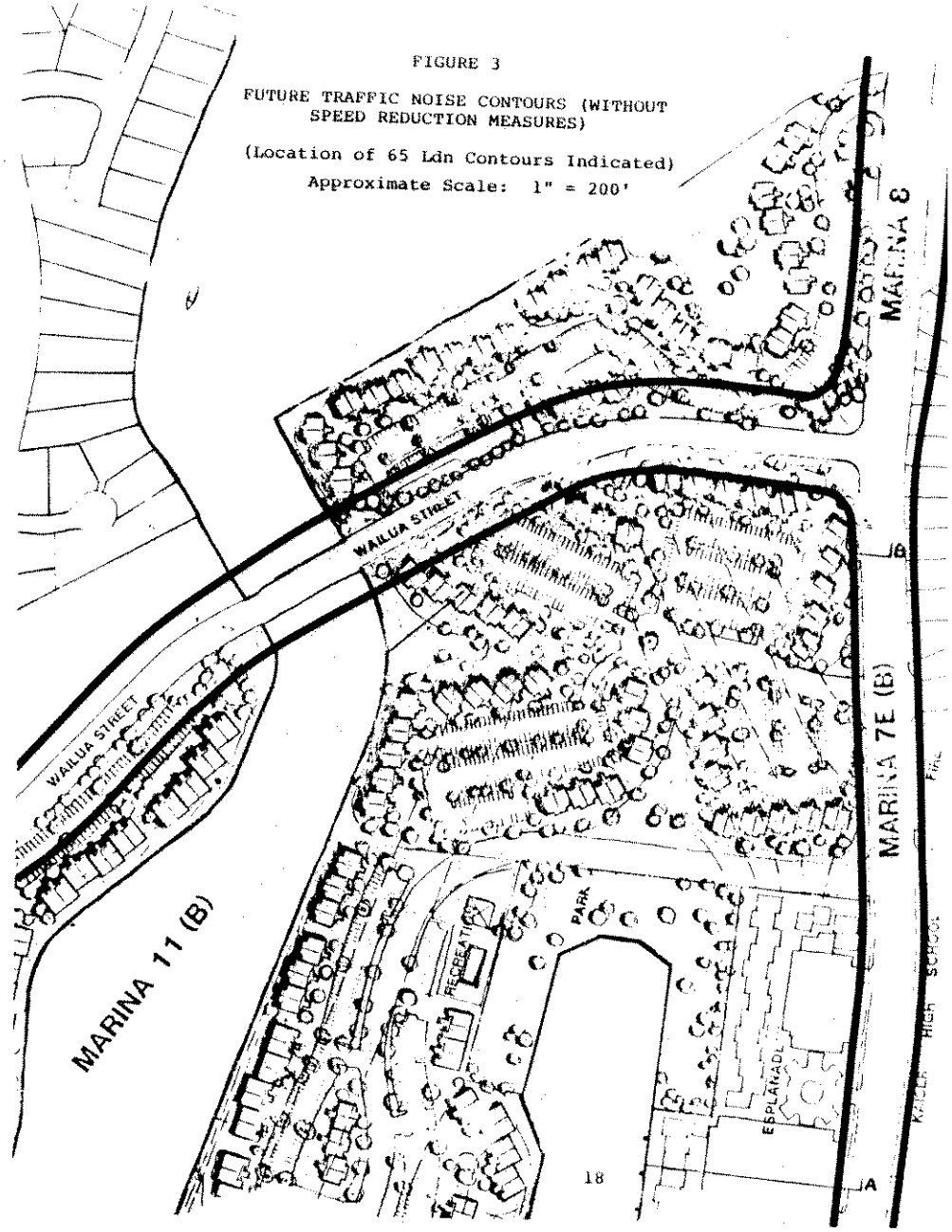
Although not examined in detail, future traffic noise level increases along Kalanianaole Highway attributable to the Marina zoning request were calculated. In respect to traffic noise increases, the Marina project will not produce measurable changes along the highway. This is due to the relatively low traffic volumes predicted for the project as compared to the current high traffic volumes on the highway. Predicted traffic noise level increases by 1994 were calculated to be less than 1 dB along Kalanianaole Highway.

FIGURE 3

FUTURE TRAFFIC NOISE CONTOURS (WITHOUT SPEED REDUCTION MEASURES)

(Location of 65 Ldn Contours Indicated)

Approximate Scale: 1" = 200'



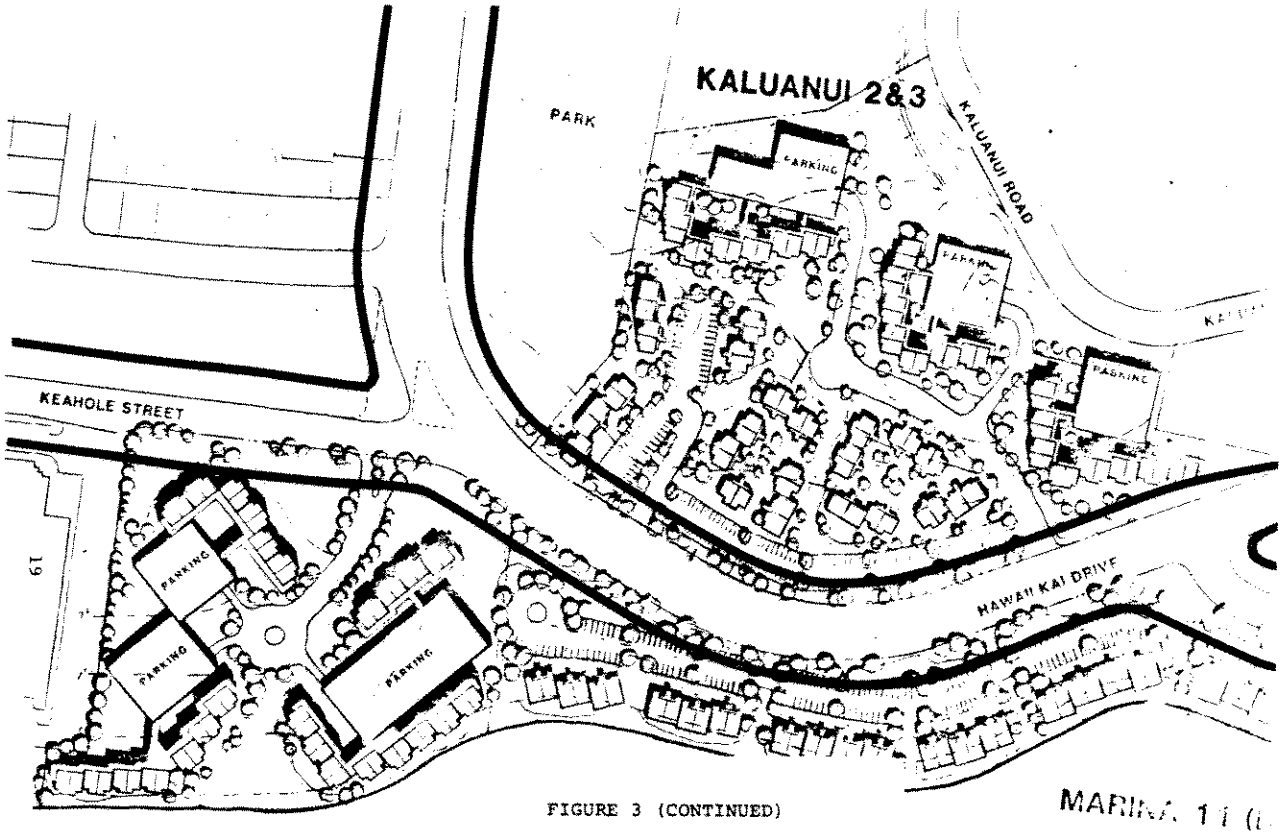


FIGURE 3 (CONTINUED)

FUTURE TRAFFIC NOISE CONTOURS (WITHOUT SPEED REDUCTION MEASURES)

(Location of 65 Ldn Contours Indicated)

Approximate Scale: 1" = 200'

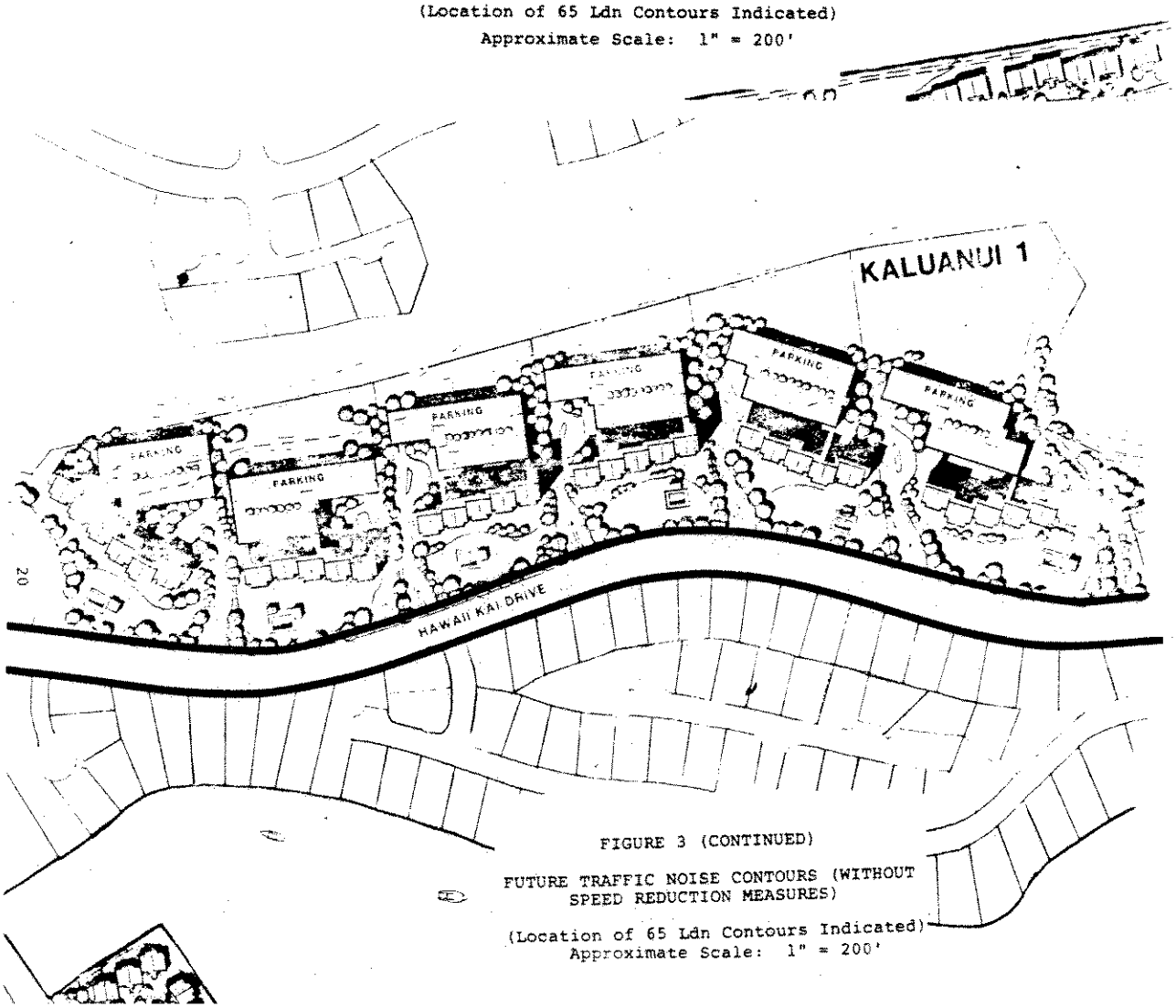


FIGURE 3 (CONTINUED)

FUTURE TRAFFIC NOISE CONTOURS (WITHOUT SPEED REDUCTION MEASURES)

(Location of 65 Ldn Contours Indicated)

Approximate Scale: 1" = 200'

VI. DISCUSSION OF PROJECT-RELATED TRAFFIC NOISE IMPACTS

Traffic noise increases resulting from both the Marina zoning request and other approved development projects in Hawaii Kai will range from 0.03 to 2.05 dB within the Hawaii Kai roadways of interest, and will be less than 1 dB along Kalanianaole Highway. These changes are summarized in Table 4, and include those resulting solely from the Marina zoning request (project). In calculating the project-related noise increases, it was assumed that 37 percent of the total increase in traffic volumes was attributable to the Marina zoning request. This percentage is midway between the 32 to 42 percent range estimated in Reference 1.

From Table 4, the increases in traffic noise levels attributable to the project are 0.6 dB or less for the high volume roadways, and 0.87 dB for the north section of Hawaii Kai Drive. This degree of change is very small, and project-related traffic noise increases will not be measurable on the high volume roadways. Along the north section of Hawaii Kai Drive, perceptible increases in traffic noise will occur, with 0.87 dB of the total increase (2.05 dB) attributable to the Marina zoning request.

In absolute terms, future traffic noise levels along the low volume north section of Hawaii Kai Drive should not exceed 65 L_{dn} at 50 ft setback distance from the roadway centerline. Therefore, existing and planned residences along this section should remain in the "Moderate Exposure, Acceptable" noise exposure category.

Future traffic noise levels along the high volume roadways are predicted to exceed the FHA/HUD standard of 65 L_{dn} at planned residences along Wailua Street in particular, and at planned units along the middle section of Hawaii Kai Drive between Wailua and Keahole Streets. The specific units of the Marina project which will probably be affected are indicated in Figure 3. These units are predicted to be in the "Significant Exposure, Normally Unacceptable" noise exposure category, and sound attenuation measures will be required in order to comply with FHA/HUD noise standards. Existing residences along Lunalilo Home Road will continue to be in the "Significant Exposure, Normally Unacceptable" noise exposure category, but increases in future traffic noise levels will be difficult to perceive.

Traffic noise impacts resulting from the Marina zoning request will be associated more with final siting of the Marina units rather than with the added vehicular traffic generated by the Marina project. The majority of the planned Marina units are within the "Moderate Exposure, Acceptable" and "Minimal Exposure, Unconditionally Acceptable" noise exposure categories. Therefore, the project should not result in serious adverse noise impacts which are not correctable.

VII. POSSIBLE NOISE MITGATION MEASURES

Possible noise mitigation measures which would minimize noise impacts on existing and future Hawaii Kai residences in the proposed Marina project area include measures such as: increasing the setbacks of future homes in the Marina project; constructing sound attenuation walls where adequate setbacks cannot be achieved in future or existing homes; reducing posted speed limits below 35 MPH so as to reduce future traffic noise; incorporating special sound attenuating window design features in upper-story homes which cannot be shielded by sound attenuating walls; and air conditioning affected spaces. The applicability of each mitigation measure depends upon other considerations besides noise, such as economic cost, aesthetics, and technical feasibility.

Reduction of average vehicle speeds from the posted speed limits of 35 MPH to 30 MPH or less can reduce future traffic noise to levels at or below existing values. Table 5 was constructed to indicate the reduced speeds below which future traffic noise would be less than existing traffic noise. For all streets except the north section of Hawaii Kai Drive, the higher noise levels associated with future increases in traffic volume can be mitigated by reductions in vehicle speeds to the 25 to 31 MPH range. Because the future traffic volume along the north section of Hawaii Kai Drive will remain relatively low (see Table 4), the use of this mitigation measure is not necessary. If this mitigation measure is used for all streets, the future traffic noise contours will be similar to those depicted in Figure 2.

TABLE 5
NOISE TRAFFIC INCREASES ASSOCIATED WITH THE PROJECT
(Reduced Speed Condition)

STREET SECTION	EXISTING L_{dn}	FUTURE L_{dn}	TOTAL INCREASE	SPEED MPH
Lunalilo Home Road (North)	66.92	66.89	-0.03	26
Lunalilo Home Road (South	64.16	64.04	-0.12	26
Wailua Street	67.53	67.56	0.03	30
Hawaii Kai Drive (North)	61.63	63.00	1.37	28
Hawaii Kai Drive (Middle)	67.81	67.96	0.15	29
Keahole Street	67.28	67.41	0.13	28

Notes: All L_{dn} values calculated at 50 feet distance from roadway centerline

For planned residences of the Marina project which are within the existing or future 65 L_{dn} contours (with vehicle speed reductions taken into account), the use of larger setback distances from the roadway centerlines is another possible noise mitigation measure. Table 6 lists the required setback distances to the existing and future 65 L_{dn} contour lines. If vehicle speed reductions are planned in the future, the "Existing" setback distances can be used. The use of this mitigation measure should be considered when two-story or higher structures are involved, since it is more difficult to provide other noise mitigation measures for these elevated dwellings.

The construction of sound attenuation walls is a standard mitigation measure, particularly for shielding single-story residences from traffic noise. In general, the wall height requirements become excessive (in the order of 10-plus feet) when multi-story residences are involved in traffic noise mitigation efforts. For this reason, this noise mitigation measure is generally limited to ground floor residential units. For residences where the increased setback distance option does not exist, the construction of sound attenuation walls has been widely applied.

Where none of the above mitigation measures are feasible, the remaining options are air conditioning the affected residential spaces or sound-treating ventilation openings (windows) to increase the exterior-to-interior noise reduction properties. The use of air conditioning within residences is not common, and is not considered a practical option for subdivision residences. The use of sound-treated windows has been applied at selected mid-rise structures in Hawaii for the purpose of meeting FHA/HUD noise standards, and is a noise mitigation option for any new home of the project which may exceed those standards.

TABLE 6
EXISTING AND FUTURE DISTANCES TO 70 AND 65 L_{dn} CONTOURS

STREET SECTION	70 L_{dn} SETBACK (FT)		65 L_{dn} SETBACK (FT)	
	EXISTING	FUTURE	EXISTING	FUTURE
Lunalilo Home Road (North)	31	39	67	83
Lunalilo Home Road (South)	20	25	44	53
Wailua Street	34	34	74	74
Hawaii Kai Drive (North)	14	19	30	41
Hawaii Kai Drive (Middle)	36	39	77	83
Keahole Street	33	37	71	80

Notes: All setback distances are to the roadway centerlines.
See Table 2 for traffic assumptions.
L_{dn} assumed to be equal to PM Peak Hour L_{eq}.

A. REFERENCES

(1) Wilbur Smith and Associates, "Hawaii Kai Transportation Management Study," February 19, 1985 (Draft).

(2) Barry, T. and Reagan, J., "FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, Federal Highway Administration, Washington, D.C., December 1978.

(3) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B," U.S. Department of Housing and Urban Development, July 12, 1979.

(4) "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980.

(5) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," Environmental Protection Agency, EPA 550/9-74-004, March 1974.

(6) Wilbur Smith and Associates, Cable to Environmental Communications, Inc., dated April 15, 1985.

A SOCIAL IMPACT ANALYSIS OF THE MARINA ZONING PROJECT PROPOSED BY KAISER DEVELOPMENT COMPANY IN HAWAII KAI, CITY & COUNTY OF HONOLULU HAWAII

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May 9, 1985

I. INTRODUCTION

The worth of a social impact analysis is like that of a science fiction story. It speaks not of what will happen, but of what might happen, and what these events will mean to people. The lack of precise social science methodologies precludes the possibility of quantifiable, accurate forecasts of the social impact of any development. However, there is value in focusing on and analyzing the critical variables and key issues as this process enables the drawing of certain conclusions.

Much can be drawn from the social sciences by planners in preparing an estimate of the social consequences of a given environmental change. Foremost among approaches for a qualitative assessment is the study of demographic data. This presentation, therefore, represents: (1) a systematic analysis of available demographic data on the socio-economic characteristics of the Hawaii Kai, community; (2) the use of comparative data, Hawaii Kai as compared to the Honolulu District which encompasses East Honolulu, and the entire City and County of Honolulu; and (3) a summary of conclusions regarding the probable social impact that the proposed Marina Zoning project will have on its residents. As proposed by Kaiser Development Company, the Marina Zoning project calls for the incremental development of approximately 2,400 housing units on about 98 acres of vacant land in Hawaii Kai.

This report is based on: (1) findings derived from social science theory relative to environmental planning and impact assessment; from government documents and studies related to this project; a field/site visit; and (2) the conclusions drawn from the analysis of these findings with respect to the issues and concerns raised in Section 10, Social Impact of Development, of Ordinance 83-6, City and County of Honolulu. The social impact issues and concerns addressed include demographic, economic, housing, public service, and physical/environmental factors.

Several tables, detailing demographic data obtained from government document and tailored specifically for this study, are attached in the Appendix.

II. SOCIAL CHANGE AND SOCIAL IMPACT THEORY

The following excerpts from professional literature in the field of environmental planning and impact analysis are presented to provide a perspective for the findings and conclusions that comprise this report.

Social change is defined as "the process by which alteration occurs in the structure and function of a social system." (Burdge & Rogers)

Any king of natural resource development, whether small or large, will bring changes to a community. The degree of social change would depend upon (1) the type and size of the development and (2) the community in which the project will be built. A large development, for example, would affect the entire fabric of the community - its institutions, size, economic base, social interaction, behavior patterns, community values and beliefs. A small development may directly affect only

some of these or have lesser impact on them. The key to assessing the impact is to look at the community, its history of capacity to adapt and change, and its unique features that will affect its capacity to change. (McEvoy & Dietz)

Whether change is beneficial to a community depends on its ability to adjust, cope, and understand the rate of change which could lead to a "dynamic equilibrium" (change which is commensurate to its ability to cope with it). (Burdge & Rogers)

Measuring the intangible effects of a development is most difficult, but there is justifiable concern for the social ramifications. The most important social variable to consider is concern for the lifestyle and behavior patterns of the people who will be affected. The other important variable is concern for the quality of life. Accordingly, the following questions should be addressed in any social impact assessment: (1) Will the project adversely affect the lifestyle of the residents in the community? (2) Will it cause disruptions of well-established patterns of a substantial number of people? (3) What will be the results in the social structures which exist in the area? (Per K. Johnson)

A neighborhood with distinctive qualities and easily defined boundaries (such as Hawaii Kai) develops stronger feelings of identification that a large area with harder to define boundaries and characteristics. Therefore, the "sense of belonging and sense of place" is stronger. (McEvoy & Dietz)

Any argument over the costs versus benefits of community growth involves questions such as these: (1) Does the development pattern require more in service costs than the tax revenue it produces? (2) What are the job levels (skilled or unskilled), wages, salaries, and profits generated by the development? (3) What are the environmental impacts? (4) What are the non-economic social impacts (e.g., traffic congestion, overcrowding of schools, disruption of existing ethnic communities)? (McEvoy & Dietz)

Several critical variables are essential considerations in a social impact assessment: (1) the current level of unemployment; (2) the skill level of the unemployed; (3) the capacity level of public services (schools, fire, police, sewers); (4) the demographic characteristics; (5) the probability of new migration; and (6) the stability and durability of the initial economic stimulus. (McEvoy & Dietz)

III. HAWAII KAI COMMUNITY PROFILE: Socio-Economic Characteristics

(Note: For purposes of this report, the Hawaii Kai community is comprised of the four census tracts used by the U.S. Bureau of the Census - CT 1.02, 1.03, 1.04, and 1.05 - see Appendix for census map. All but 120 of the proposed 2,400 housing units would be located in census tracts 1.03 and 1.05; the 120 units would be in tract 1.04.)

Population:

The 1984 State of Hawaii Data Book gives Hawaii Kai's 1983 population as 27,021 people. As a fast-growing "bedroom" residential community, this area experienced tremendous population growth in the decade between 1970 and 1980. In comparison with a 21% increase for Honolulu County and a 12.4% increase for Honolulu District, Hawaii Kai's population increased 104%. While the subsequent period between 1980 and 1983 saw only a 5.5% increase, it was at a faster rate than the county's 3.3% or the district's 2.3% rate.

Population Growth

	Honolulu County	Honolulu District	Hawaii Kai
1970	630,528	324,871	12,572
1980	762,565 (+21%)	365,048 (+12.4%)	25,603 (+104%)
1983	787,350 (+3.3%)	373,311 (+2.3%)	27,021 (+5.5%)

Within Hawaii Kai, the population growth occurred primarily in census tracts 1.03 and 1.04, while the older/established areas in tracts 1.02 and 1.05 experienced slight decreases in the past few years.

	CT 1.02	CT 1.03	CT 1.04	CT 1.05
1970	1915	3,243	1834	5580
1980	2067 (+8%)	10,784 (+233%)	7202 (+293%)	5550 (-.5%)
1983	2054 (-.6%)	11,912 (+10.5%)	7540 (+5%)	5515 (-.6%)

Number of Households:

Based on the 1980 census population of 25,603, Hawaii Kai had 7,518 households, or an average of 3.4 people per household. This compares to a higher 3.6 people per household in Honolulu County. The breakdown by census tracts reveals that the lowest rate is in tract 1.03, where most of the high-rise residential buildings are situated.

Number of Households - Hawaii Kai

Population-1980		No. of Households	No. Per Household
CT 1.02 -	2,067	599	3.4
CT 1.03 -	10,784	3,462	3.1
CT 1.04 -	7,202	1,947	3.7
CT 1.05 -	5,550	1,510	3.6

Projected Population Increase:

Based on the figure of 3.4 people per household, the projected increase of population with the developmnt of 2,400 units is 8,160 people. Added to the 1983 population figure of 27,021, the total Hawaii Kai population would be 35,181 - a 30% increase.

Age: (See Appendix)

The Hawaii Kai community is made-up of predominantly families and with people below the age of 55. The greatest percentage of adults fall in the 35 to 54 age bracket, with their children predominantly of school age between 5 and 19 years. Conversely, there are noticeably fewer people over 55. This is true particularly in census tracts 1.03 and 1.04, the more recently developed areas which also have the greatest number of residents. The comparative differences with the county and district figures are significant.

Age Groups

	Honolulu County	Honolulu District	Hawaii Kai
Under 5	- 7%	6%	6%
5 - 19	- 24%	20%	30%
20 - 34	- 31%	30%	21%
35 - 54	- 22%	22%	32%
55 - 64	- 9%	11%	7%
65 - & Over	- 7%	11%	4%

The above information is confirmed through statistics on school enrollment and the labor force (see below), as well as Locations, Inc.'s Oahu Residential Market Study which found that home buyers in Hawaii Kai "tend to be older, 41 years for the average single family buyer and 35 for the condominium buyer".

Place of Birth: (See Appendix)

Although 52% of Hawaii Kai residents were born in Hawaii (versus 55% of county and 56% of district residents), of the three areas compared, Hawaii Kai has the highest percentage of people born in other states, 39% (compared to 30% for the county and 26% for the district). It also has the lowest percentage of foreign people.

Years of School Completed: (See Appendix)

Compared to the county and district, a significantly higher percentage of Hawaii Kai residents, almost two-thirds, have had at least some college education, with the highest percentage also of those who have had four or more years of college.

College Education

College:	Honolulu County	Honolulu District	Hawaii Kai
1 - 3 yrs. -	18%	18%	23%
4 or more -	22%	24%	38%
TOTAL -	40%	42%	61% (69% in CT 1.02)

Labor Force: (See Appendix)

The Hawaii Kai population, compared to the county and district as a whole, has a large percentage of employable age persons. Its labor totals 73% of the total population 16 years of age and older. Of this number, 97.6% of the people are employed, with only 2.4% unemployed. Next to the 2.3% rate for the Waialae-Kahala community, Hawaii Kai has the second lowest unemployment rate of the 33 communities on Oahu. Honolulu County has a 4.6% rate, and the Honolulu District has 4.1%.

Occupation: (See Appendix)

Here again, the comparisons are consistent and corroborate the impressions people have of a "silk stocking" community. A large proportion, 41%, of Hawaii Kai's employed residents are in managerial, professional speciality, and professional and related services occupations. This compares with 28% for the county and 30% for the district. Conversely, Hawaii Kai has the lowest comparative percentage of the labor force in categories of service and blue collar occupations, 14%, versus 27% for the county and 24% for the district.

Income in 1979: (See Appendix)

The higher-than-average affluence of Hawaii Kai residents is revealed through these statistics: 50% of households had incomes over

$35,000 per year in 1979, including 21% with incomes over $50,000. In contrast, only 23% of total households in the county had incomes over $35,000, with only 9% over $50,000. The median income for residents of Hawaii Kai was $36,232 versus the $21,077 for the county and $19,987 for district residents.

Housing:

There are 8,000 existing housing units in Hawaii Kai, of which 1,100 are low density and 1,200 medium density units. The proposed development would add 2,400 units, of which 470 would be low density and 1,930 medium density. The development would thus increase the total number of housing units in this area to 10,400. This represents a 30% increase. Low density units would increase about 15%, while the percentage of medium density units would double from 15% to 30% of total housing units.

- Home Ownership vs Rental: (See Appendix)

  There are significant differences, with a high rate of home ownership (82%), versus rentals (18%). The median incomes of both home owners and renters in Hawaii Kai are also higher than those residing in the district as a whole and in the county.

- Need and Demand for Housing:

  Residential construction in Hawaii peaked in the 1970s, and the 1983 rebound experienced on the mainland has not yet been felt here. The result, according to Location, Inc.'s Oahu Residential Market Study, is a shortage of housing, with "extremely low vacancy rates and rapidly increasing rents" (resulting from the housing shortage). There is a great need for affordable housing on this island.

Schools:

There are three public elementary schools and one public high School in the Hawaii Kai area, with the intermediate school in adjacent Niu Valley. The elementary schools are: (1) Koko Head (CT 1.02); (2) Hahaione (CT 1.03); (3) Kamiloiki (CT 1.04). The high school is Kaiser (CT 1.05).

- Enrollment Projections - Public Schools:

  The State Department of Education in its "Enrollment Projections of the Public Schools in Hawaii - 1984-1989" notes that in Hawaii as nationwide, public school enrollment declined in the decade between 1972 and 1982. During the same period, enrollment in private schools increased in this State. However, the decline in public school enrollment here has stopped as of 1983, with a

concomitant leveling off in private school enrollment. The Department of Education expects the upward trend in the State to continue through the year 2000. Large gains of about 15% are expected at the elementary school level, with a decrease in grades 7 thru 12.

Hawaii Kai Schools - Population & Projections

Elementary		1983	1984	1985	1986	1987	1988	1989
Hahaione	-	445	450	454	452	460	496	526
Kamiloiki	-	651	650	677	709	721	755	764
Koko Head	-	334	308	316	319	322	343	360
Intermediate								
Niu Valley	-	813	751	631	601	563	543	565
High School								
Kaiser	-	1679	1665	1592	1548	1355	1237	1107

While the above projections do not account for the projected population increase that would result from this proposed development, the above table illustrates that the Department of Education's projections for the elementary schools are comparatively insignificant, with decreases projected for the intermediate school and high school. In addition, based on a projected number of about one-third of school age children in the new population who may be sent to private schools (see below), the assumption is that the public schools have the physical capacity to absorb additional children.

School Enrollment and Type of School: (See Appendix)

Statistics confirm the preponderance of school age children in Hawaii Kai in grades K - 12, which amounts to 78% as compared to the figures of 72% in the county and 66% in the district. Conversely, the number of college-age children in Hawaii Kai, 17%, is smaller than the 23% for the county and the 30% for the district.

The affluence of families in Hawaii Kai and their higher socioeconomic status are again reflected in the proportionately higher percentage who educate their children in private schools. The figures are double that of the rest of the county. (See table.)

Public and Private School Enrollment

	Grades K - 8 Public	Grades K - 8 Private	Grades 9 - 12 Public	Grades 9 - 12 Private
Hawaii Kai -	63%	37%	65%	35%
Honolulu Dist. -	77%	23%	77%	23%
Honolulu Co. -	82%	18%	82%	18%

Transportation to Work: (See Appendix)

Of the three areas studied, Hawaii Kai residents rely most heavily on private vehicle transportation - 88% versus the 76% for the county and 75% for the district. Hawaii Kai residents also make the least use of public transportation - 8% versus 10% for the county and 14% for the district. (This ratio is most pronounced in census tract 1.02 where it is 91% private transportation versus 3% public transportation. CT 1.02 is also the area with the highest median income in Hawaii Kai.)

IV. COMMUNITY RESOURCES

Recreation and Leisure-time Resources:

There are three public parks in the Hawaii Kai area: (1) Koko Head District Park (CT 1.02); (2) Hahaione Playground (CT 1.03); and Kamiloiki Community Park (CT 1.04). Under the jurisdiction of the City and County of Honolulu Department of Parks and Recreation, these recreational facilities provide the same year-round programs and services available to other public parks on Oahu.

There are two golf courses in the area, the marina, and good beaches nearby which provide ample recreational diversity for the residents.

In addition, Hawaii Kai has its own public library, first-run movie theatres, and a post-office.

Medical-Dental Facilities:

While the nearest general hospital is several miles away, the Hawaii Kai Emergency and Family Medicine Clinic in the Kuapa Kai Shopping Center is available for emergency medical care as well as on-going family medical care. It currently is staffed by three physicians, nurses, and other qualified ancillary staff.

Other private medical facilities in the area, extensions of well-established reputable medical entities, include the Kaiser Clinic (Kuapa Kai Center) and the Straub Clinic (Koko Marina Shopping Center).

The telephone directory lists about a half-dozen dentists who have offices in Hawaii Kai.

Commercial - Retail Facilities:

Integrated into the Hawaii Kai planned community are two shopping complexes, Kuapa Kai and Koko Marina, which offer a wide range of shops, restaurants, banks and other financial institutions. Future plans call for more commercial growth, including the Hawaii Kai Towne Center.

Public Safety:

The location of a City and County of Honolulu Fire Department Station in Hawaii Kai, at 505 Lunalilo Home Road, ensures fire protection for this area.

The Honolulu Police Department has a patrol unit to provide police services to Hawaii Kai residents. The Major in charge of the Patrol Division reports that Hawaii Kai has the lowest number of calls to HPD requesting police help in the entire Honolulu District. An anticipated gradual increase in population is not seen as a major problem.

Public Utilities:

In line with the Hawaii Kai planned community, planning and construction of utilities such as roads, sewers, and drainage were based on the 1966 Detailed Land Use Map for Hawaii Kai. The base population that these utilities were designed for is greater than the population presently existing or projected.

V. CONCLUSIONS

1. Hawaii Kai is a unique community in many ways. Its advantages include a well-planned, self-contained community in a lovely natural environment. It is made up of a fairly homogeneous population in terms of socio-economic characteristics and background. Statistics confirm that taken as a whole, it is a more affluent, well-educated population, with an almost equal mix of local-born people versus those born in other places. Other indicators of the homogeneity and productivity of its residents include the significant findings regarding age, education, occupation, labor force, and income factors.

   It is a profile of a community which includes fairly young households (with an average 3.4 people per household), where most adults fall in the 35 to 54 age bracket, and where most children are between 5 to 19 years of age. Hawaii Kai has a large percentage (73%) of employable people and its unemployment rate is the second lowest in this county. The affluence of the residents is reflected in the high median incomes; the large number (82%) who own their homes and drive their own cars to work (88%); and the sizable proportion who send their children to private schools (37% for grades K - 8, and 35% for grades 9 - 12).

2. The nature and degree of social impact and social change in a community will depend upon the type and size of the development, as well as the community's capacity to adapt and adjust to change.

The proposed development involves only housing, not a mixed development. The additional 2,400 housing units will mean an eventual 30% increase in population, from approximately 27,000 to approximately 35,000 people. While this is a rather large increase, the mitigating factor is that the increase will be gradual, as the development will be incrementally phased over a seven year period and attuned to the needs and demands of the marketplace. The projected population increase falls within the Oahu General Plan's population guidelines for this area.

Hawaii Kai's greatest growth spurt was in the decade of the 1970's, when its population slightly more than doubled (104%). The greatest social impact and change would have occurred during that period. The population increase has leveled off to about 5% in recent years, and the anticipated gradual growth may well average out to this rate of growth.

The apparent stability of this community, reflected by its "coming of age" maturity, as well as its homogeneous middle and upper-middle class population with similar social values and norms, lend support to the assumption that its residents have good capacity to adapt and to adjust to change.

3. The most important variables in social impact assessment are the community's lifestyle and the quality of life. Of great concern is what effect a particular development will have upon them.

Most of the people who live in Hawaii Kai made a conscious choice to do so because of the advantages that the area offers. These advantages include the stability, amenities, and quality of life that are commensurate to their above average socio-economic status and their values. The high rate of home ownership indicates that the residents have made financial and emotional commitments and are strongly motivated to maintain and enhance the existing lifestyle.

Moving into a well-established and prestigious residential area, it is anticipated that the new population will possess similar socio-economic characteristics. They would have similar social values and goals, and behavior norms that will be consistent with those of the existing population. Therefore, conformity and the desire to continue and maintain the quality of life can be expected. The gradual, rather than rapid, influx of new residents will favorably help in their assimilation into the community.

Some social changes will occur, however, as any development produces change. The one major factor which would impact on the lifestyle and quality of life of residents in Hawaii Kai and adjacent areas is the increased vehicular traffic which additional residents

will generate. The existing traffic congestion on Kalanianaole Highway is exacerbated by the residents' great dependence on private rather than public transportation. Increased traffic congestion would impact on the lifestyle and the quality of life as people make further adjustments to their daily schedules of living. The mitigating factors would be the developer and traffic consultants finding solutions to the traffic problem, and the capacity of Hawaii Kai residents to adapt and adjust to change.

4. On the issue of benefits for the community and its residents, the "economic costs versus benefits" ledger tilts in favor of the development. While the exact number of new jobs that the development will create is undetermined due to its planned phasing and flexible construction schedule, the project will contribute to the economy through the millions of dollars that will be spent on labor, materials, and other development-oriented expenditures. Beyond that, tax revenues would be generated through the potential new jobs that an increased population will require, as well as increased sales taxes and property taxes.

As Hawaii Kai is a residential community, the development would not directly impact the visitor industry or the visitor population.

5. Another economic benefit is that 2,400 units will be added to the island's housing inventory. Locations, Inc.'s Oahu Residential Market Study confirmed that there is a current shortfall in housing units on Oahu, particularly affordable housing. The study also identified Hawaii Kai, Makakilo, and Mililani to be the most feasible areas for future housing development.

Flexibly geared to meet market demands, the proposed 2,400 units would provide quality housing in a quality environment, and would be aimed at attracting a wide variety of buyers. As low to medium density units are cheaper to build than detached single dwelling houses, the intent is to make more affordable housing available, particularly to first-time buyers.

6. The basic public infrastructure (roads, sewers, drainage) within the project area is already in place. These facilities have the capacity to adequately meet the increased requirements of a larger populace.

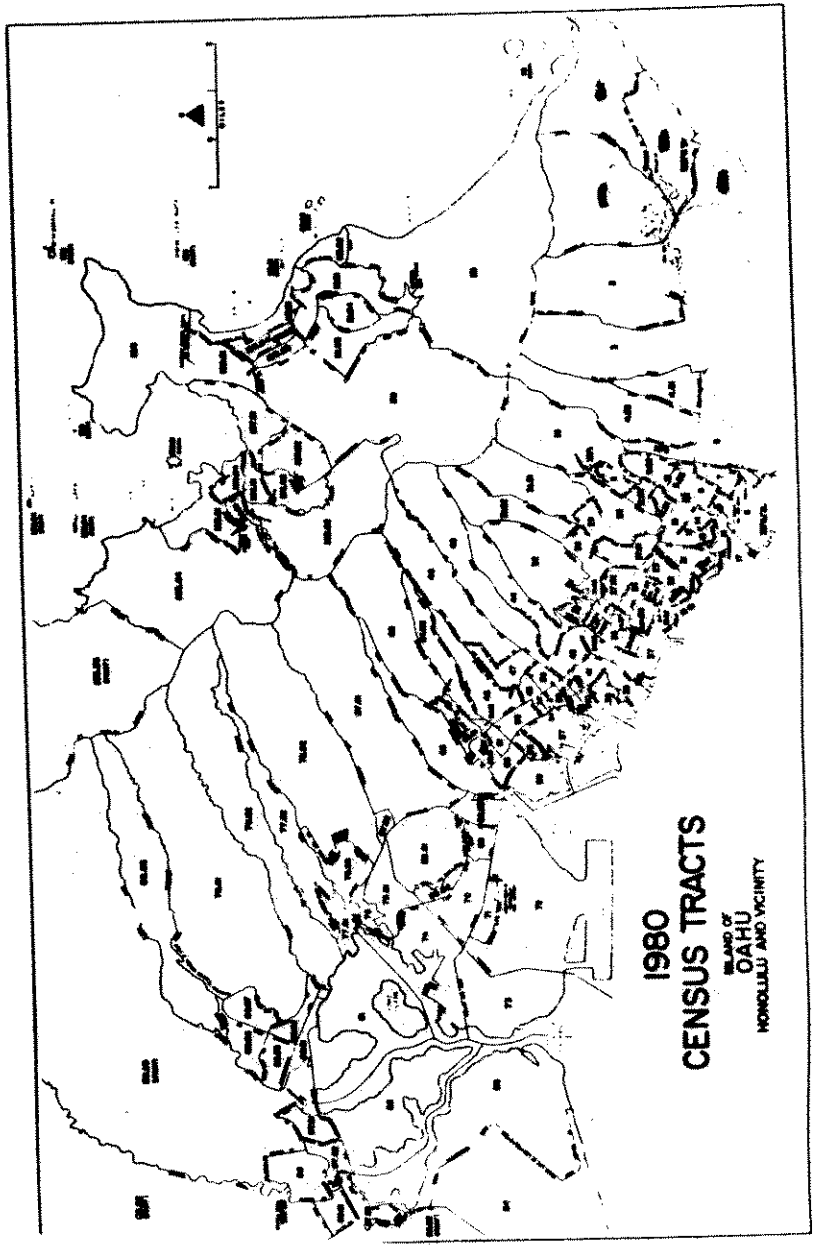
7. Hawaii Kai is fortunate in having good institutional resources. Existing educational, recreational and leisure time facilities, and medical-dental resources in the area are above average and adequate to meet the needs of additional residents.

8. Public safety resources such as fire and police protection, as well as garbage and waste disposal services, are already being provided. An expansion of services would be required and the developer will be reviewing the matter with the agencies involved.

9. Depending on a person's or a community's social and economic values, there are plausible arguments for both preservation of the status quo and growth. Both have advantages and dis-advantages, with clearly identifiable socio-economic benefits and costs.

One resolution is to have selective, high quality developments which will preserve those values considered to be the most valuable to the people affected, while providing social and economic benefits. These would include well-planned and implemented projects, architecturally and tastefully appropriate to the environment, which would have minimal social impact on the community.

Evaluated in the context described above, the proposed Marina Zoning project appears to be such a development. The integrity and commitment of Kaiser Development Company is evidenced by the quality development of the Hawaii Kai planned community over a long period of time. This is a significant factor as it provides greater assurance that the proposed development will protect environmental concerns for continued aesthetic quality and adequate open space. Also, that the developer will be sensitive to the concerns and needs of the residents, will work with government agencies to find appropriate solutions to problems such as traffic congestion, and provide appropriate amenities which will not only maintain, but enhance the existing lifestyle and quality of life of its residents.



BIBLIOGRAPHY

Burdge, Rabel J. & Rogers, Everett M., "Social Change in Rural Societies" (Second Edition); Prentice-Hall, Englewood Cliffs, New Jersey; 1972.

Department of Education, State of Hawaii, "Enrollment Projections of the Public Schools in Hawaii 1984"; April 1984.

Ditton, Robert B. & Goodale, Thomas L., "Environmental Impact Analysis: Philosophy and Methods"; University of Wisconsin Sea Grant Program; 1972.

Johnson, Per K., "Social Aspects of Environmental Impact"; article in Ditton and Goodale's "Environmental Impact Analysis: Philosophy and Methods"; University of Wisconsin Sea Grant Program; 1972.

Locations, Inc. Research and Consulting Division , "Oahu Residential Market Study," Executive Summary; prepared for Kaiser Development Company; October 1984.

McEvoy, James III & Dietz, Thomas, "Handbook for Environmental Planning: The Social Consequences of Environmental Change"; John Wiley & Sons, Inc., New York, London, Sydney, Toronto; 1977.

State of Hawaii "Data Book 1984: A Statistical Abstract"; Department of Planning & Economic Development; February 1985.

U.S. Department of Commerce, Bureau of the Census, "1980 Census of Population and Housing"; PHC 80-2-183.

APPENDIX

SOCIAL CHARACTERISTICS OF PERSONS: 1980

TABLE I	AGE
TABLE II	PLACE OF BIRTH
TABLE III	SCHOOL ENROLLMENT & TYPE OF SCHOOL
TABLE IV	YEARS OF SCHOOL COMPLETED
TABLE V	TRANSPORTATION TO WORK
TABLE VI	LABOR FORCE
TABLE VII	OCCUPATION & SELECTED INDUSTRIES
TABLE VIII	INCOME IN 1979

(Source: U.S. Department of Commerce, Bureau of the Census, "1980 Census of Population and Housing" - PHC 80-2-183)

TABLE I

SOCIAL CHARACTERISTICS OF PERSONS: 1980

AGE

	Honolulu County	Honolulu District	Hawaii Kai	(Hawaii Kai Census Tracts) CT 1.02	CT 1.03	CT 1.04	CT 1.05
Population	762,565	365,048	25,603	2067	10,784	7202	5550
Under 5	60,154= 7%	22,892= 6%	1,551= 6%	78= 4%	626= 6%	580= 8%	267= 5
5 - 19	185,014=24%	73,860=20%	7,644=30%	638=30%	2988=28%	2346=32%	1672=30
20 - 34	232,827=31%	108,559=30%	5,322=21%	312=15%	2396=22%	1487=21%	1127=21
35 - 54	164,105=22%	81,311=22%	8,225=32%	690=34%	3432=32%	2359=33%	1744=31
55 - 64	65,097= 9%	40,415=11%	1,875= 7%	244=12%	875= 8%	287= 4%	469= 8
65 & Over	55,368= 7%	38,011=11%	986= 4%	105= 5%	467= 4%	143= 2%	271= 5

TABLE II

PLACE OF BIRTH

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Hawaii	420,120=55%	202,952=56%	13,360=52%	673=31%	4320=40%	4515=63%	3852=69
Mainland	229,234=30%	94,058=26%	9,880=39%	1165=54%	5220=49%	2158=30%	1337=24
Foreign	113,211=15%	68,038=18%	2,363= 9%	328=15%	1145=11%	529- 7%	361= 7

ource: Table P-9
S. Census 1980

TABLE III

SCHOOL ENROLLMENT & TYPE OF SCHOOL

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
chool Pop. yrs. and ver	214,345	94,505	8,836	784	3484	2657	1911
irsery and reschool	Total: 10,277= 5% ** Public: 2,318=23% Private: 7,959=77%	Total: 4,082= 4% ** Public: 833=20% Private: 3,249=80%	Total: 427= 5% ** Public: 38=9% Private: 389=91%	36= 5% ** 0 36=100%	173= 5% ** 25=14% 148=86%	173= 7% ** 13=8% 160=92%	45= 2 0 45=10
inder-garten irough th Grade	Total: 103,958=48% ** Public: 84,729=82% Private: 19,229=18%	Total: 40,803=43% ** Public: 31,554=77% Private: 9,249=23%	Total: 4397=50% ** Public: 2749=63% Private: 1648=37%	345=44% ** 91=26% 254=74%	1749=50% ** 1139=65% 610=35%	1499=56% ** 931=62% 568=38%	804=42 588=73 216=27
igh School 4 years)	Total: 51,521=24% ** Public: 42,131=82% Private: 9,390=18%	Total: 21,557=23% ** Public: 16,597=77% Private: 4,980=23%	Total: 2517=28% ** Public: 1645=65% Private: 872=35%	252=32% ** 79=31% 173=69%	955=28% ** 579=61% 376=39%	635=24% ** 480=76% 155=24%	675=36 507=75 168=25
ollege	Total: 48,589=23% (23% of total school popul.)	Total: 28,043=30% (30% of total school popul.)	Total: 1495=17% (17% of total school popul.)	151=19%	607=17%	350=13%	387=20

(** These represent percentages of the total school population.)

Source: Table P-9
U.S. Census 1980

TABLE IV

YEARS OF SCHOOL COMPLETED

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Population 25 years and older	428,566	230,437	14,960	1308	6511	3972	3169
High School (4 years)	152,346=36%	75,731=33%	4,499=30%	329=25%	1784=27%	1219=30%	1167=37
COLLEGE 1-3 yrs.	78,386=18%	40,636=18%	3,498=23%	302=23%	1568=24%	1005=25%	623=20
COLLEGE 4 & more	93,201=22%	55.406=24%	5,603=38%	596=46%	2657=41%	1434=36%	916=29
	Total=40%	Total=42%	Total=61%	69%	65%	61%	41

TABLE V

TRANSPORTATION TO WORK

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Workers 16 yrs. & over	369,523	183,677	12,819	962	5482	3515	2860
Private Vehicle	282,479=76%	138,411=75%	11,321=88%	882=91%	4762=87%	3139=89%	2538=89
Public Transport.	37,042=10%	24,841=14%	1,053= 8%	27= 3%	515= 9%	276= 8%	235= 8
Other	50,002=14%	20,425=11%	445= 4%	53= 6%	205= 4%	100= 3%	87= 3

Source: Table P-10
U.S. Census 1980

TABLE VI

LABOR FORCE

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Persons 16 Years and Older	574,903	291,949	18,571	1665	7876	4776	4254
Total Labor Force	397,889=69%	198,090=68%	13,560=73%	1040=63%	5848=74%	3738=78%	2934=69
Civilian Labor Force	339,863	187,455	13,407	1040	5772	3675	2920
Employed	324,113=95.4%	179,765=95.9%	13,077=97.6%	997=95.9%	5620=97.4%	3590=97.7%	2870=98
Unemployed	15,750= 4.6%	7,690= 4.1%	326= 2.4%	43= 4.1%	152=2.6%	85= 2.3%	46= 1

Source: Table P-10
U.S. Census

TABLE VII

OCCUPATION & SELECTED INDUSTRIES

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Employed-16 Yrs. & Older	324,113	179,765	13,081	997	5620	3590	2874
Managerial, Professional Specialty	79,934=16%	47,551=17%	5,261=27%	501=32%	2512=30%	1316=25%	932=22
Technical, Sales, Admin. Support	109,521=23%	62,421=23%	4,814=24%	381=25%	1964=23%	1369=26%	1100=26
Service Occupations	56,939=12%	32,812=12%	1,436= 7%	33= 2%	602= 7%	494= 8%	377= 9
Farming, Forestry, Fishing	5,838= 1%	2,148=.7%	59=.3%	6=.3%	42=.4%	---	11=.2
Precision, Production, Repair	36,546= 8%	17,139= 6%	831= 4%	57= 4%	275= 3%	284= 5%	215= 5
Operator, Fabricators, Laborers	35,335= 7%	17,694= 6%	680= 3%	19= 1%	225= 2%	197= 4%	239= 5
Manufac-turing	24,982= 5%	12,751= 5%	705= 4%	82= 5%	244= 3%	222= 4%	157= 4
Wholesale, & Retail Trade	79,644=16%	47,526=17%	3,702=16%	220=14%	1387=16%	796=15%	669=16
Professional & Related Services	59,927=12%	34,451=13%	2,796=14%	255=16%	1244=15%	719=13%	578=14

Source: Table P-11
U.S. Census 1980

TABLE VIII

INCOME IN 1979

	Honolulu County	Honolulu District	Hawaii Kai	CT 1.02	CT 1.03	CT 1.04	CT 1.05
Households	230,931	127,326	7,476	652	3422	1936	1466
Less than $10,000	48,065=21%	29,328=23%	360= 5%	60= 9%	191= 6%	56= 3%	53= 4
$10,000 - $19,999	61,153=26%	34,628=27%	805=11%	56= 9%	478=14%	101= 5%	170=11
$20,000 - $34,999	68,496=30%	34,390=27%	2,584=34%	130=20%	1073=31%	799=41%	582=40
$35,000 - $49,999	33,443=14%	16,415=13%	2,156=29%	163=25%	948=28%	591=31%	454=31
$50,000 and more	19,774= 9%	12,565=10%	1,571=21%	243=37%	732=21%	389=20%	207=14
Median Income	$21,077	$19,987	$36,232	$42,164	$34,490	$35,186	$33,089
Mean Income	$25,180	$25,266	$39,892	$47,933	$36,893	$38,752	$35,991
Owner-Occup. Households	115,290=50%	56,524=44%	6,163=82%	579=89%	2519=74%	1790=92%	1275=87
Median Income	$30,248	$30,747	$37,813	$44,090	$37,339	$35,201	$34,623
Mean Income	$33,893	$35,696	$41,634	$51,098	$39,551	$38,406	$37,482
Renter-Occup. Households	115,641=50%	70,802=56%	1,313=18%	73=11%	903=26%	146=8%	191=13
Median Income	$13,912	$13,975	$26,180	$20,104	$26,345	$34,521	$23,750
Mean Income	$16,693	$16,939	$30,334	$22,828	$29,478	$42,996	$26,036

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

June 18, 1985

Mr. F. J. Rodriguez, President
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Subject: Your Letter of May 31, 1985, on the Environmental Impact Statement Preparation Notice for the Marina Zoning Project at Hawaii Kai, TMK: 3-9-08:Por. 13, 3-9-08:16

Thank you for allowing us the opportunity to review and comment on the environmental document for the proposed rezoning of vacant land for apartment use.

We have no objections to the rezoning request. The availability of water will be determined when the building permits are submitted for our review and approval.

If you have any questions, please contact Lawrence Whang at 527-6138.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

NO RESPNSE NEEDED

JUN 1 1985

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

June 19, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

We have reviewed the Environmental Impact Statement Preparation Notice for the proposed Marina Zoning Project at Hawaii Kai and have no comments at this time.

Very truly yours,

FRANK K. KAHOOHANOHANO
Fire Chief

FKK:lm/KAW

NO RESPONSE NEEDED

JUN 21 1985

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

TOM T. NEKOTA
DIRECTOR

June 20, 1985

Mr. F. J. Rodrigues
Environmental Communications, Inc.
1146 Fort Street Mall, Suite 200
Honolulu, Hawaii 96809

Dear Mr. Rodrigues:

Subject: Environmental Impact Statement Preparation Notice
Marina Zoning Project - Hawaii Kai
TMK: 3-9-08 and 3-9-09

We have reviewed the proposed Marina Zoning project in Hawaii Kai and make the following comments and recommendation.

The report does not address the recreational impact that the proposed project would have on our public park system in Hawaii Kai. The 2400 residential units proposed to be built is very substantial and adequate open space and recreational facilities should be included in the applicant's plans for the project.

The report does acknowledge that the project will be required to comply with the Park Dedication Ordinance No. 4621. However, no description is provided as to how compliance with the Ordinance will be accomplished.

We recommend that the applicant directly contact our Department to discuss the project's recreational needs and park dedication requirements.

Should you have any questions, please call Mr. Jason Yuen at 527-6315.

Sincerely yours,

Tom Nekota

TOM T. NEKOTA, DIRECTOR

TN:ct

JUN 21 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL
COMMUNICATIONS
INC.

July 1, 1985

Mr. Tom T. Nekota, Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Nekota:

We are in receipt of your comments dated June 20, 1985 on the proposed Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

The concerns expressed by your department on the anticipated impacts that the proposed zoning application will have on the existing parks system at Hawaii Kai have been reviewed by the developer. The draft EIS will discuss the availability of existing parks and recreational open space that are currently available, and their applicability to the proposed zoning request. This information has been provided to the DLU for their concurrent review in the Zoning Application. Your comments on this aspect of the draft EIS will be appreciated.

Thank you for your comments and we look forward to discussing this further with you and your staff.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

1146 FORT STREET MALL, SUITE 200 • P.O. BOX 535 • HONOLULU, HAWAII 96809 • TELEPHONE (808) 521-4161

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

HERBERT K. MURAOKA
DIRECTOR
AND BUILDING SUPERINTENDENT

PB 85-568

June 10, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: EIS Preparation Notice
Marina Zoning Project at Hawaii Kai, Oahu

We have no comments on the proposed Marina Zoning Project at Hawaii Kai.

Thank you for the opportunity to review the subject EIS Preparation Notice.

Very truly yours,

FOR HERBERT K. MURAOKA
Director and Building Superintendent

cc: J. Harada

NO RESPONSE NEEDED

JUN 13 1985

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

DONALD A. CLEGG
CHIEF PLANNING OFFICER

GENE CONNELL
DEPUTY CHIEF PLANNING OFFICER

VW/DGP 6/85-1595

June 7, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Sir:

Environmental Impact Statement (EIS) Preparation Notice, Kaiser Development Company, Marina Zoning, Hawaii Kai

We have reviewed the subject EIS Preparation Notice and offer the following recommendations:

Item III.B.3. Traffic Generation on Kalanianaole Highway

We recommend that analysis be included to provide quantitative answers to the following questions:

1. What will be the impact of the 2,400 additional housing units in terms of the added traffic on Kalanianaole Highway during the morning rush traffic (7:00 - 9:00 A.M.) and the evening rush traffic (4:00 - 6:00 P.M.)? Quantify this impact in terms of added: (a) travel time from Hawaii Kai to Downtown Honolulu, (b) total costs/day for vehicle operation and drivers' time loss, and (c) air pollution, and (d) noise.

2. Will the proposed traffic management program mitigate these adverse impacts? Quantify all results anticipated. For example, how many fewer automobiles on Kalanianaole Highway are expected as a result of fully operational ride-sharing? Explain how this estimate is derived. Similarly, how many fewer automobiles can be anticipated on Kalanianaole Highway as a result of parking and riding the bus to Downtown Honolulu?

Item III.D.2. Affordable Housing in the Marina Zoning Development

The issue of affordable housing is not addressed; we recommend that the following data be supplied concerning the required 10% affordable housing:

1. Where will these 240 housing units be located.

2. What price range is planned for these units? Specify how many units at each price level?

Thank you for this opportunity to comment on this EIS Preparation Notice.

Sincerely,

Donald A. Clegg

DONALD A. CLEGG
Chief Planning Officer

cc: Mr. John P. Whalen, DLU

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Donald A. Clegg
Chief Planning Officer
Department of General Planning
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

We are in receipt of your comments dated June 7, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

1. The impact of the additional housing units on the traffic conditions existing presently on Kalanianaole Highway are being analyzed by the retained traffic consultant, Wilbur Smith & Associates. Particular emphasis is being placed on the peak travel times of morning and evening. The issues of air pollution and noise also will be addressed in the draft EIS. The total costs/day for vehicle operation and driver's time resulting from the additional housing units is difficult to quantify since they depend on so many other factors. These were not addressed in the Transportation Management Study because one of the requirements of the study was to recommend mitigation measures such that when implemented, traffic would be better, or as a minimum, the same as it currently is.

2. The proposed traffic measures are designed to mitigate the adverse impacts resulting from the additional housing units. A detail explanation will be provided with the draft EIS. These are provided in Appendix C.

3. Fulfillment of the affordable housing requirement for the Marina Zoning presently is being discussed with the Department of Housing & Community Development. An assessment on the manner in which the requirement will be met is expected within the time frame of the Zoning Application process.

We look forward to your department's comments on the draft EIS on these matters.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 941-1311

FRANK F. FASI
MAYOR

DOUGLAS G. GIBB
CHIEF

WARREN FERREIRA
DEPUTY CHIEF

IN REPLY REFER TO: ES-GF/DJA

June 10, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

We have reviewed the EIS preparation notice for the Marina Zoning project forwarded to us on May 31, 1985, and provide the following comments for your consideration.

1. An addition of this magnitude to the residential population of Hawaii Kai will mean an increase in calls for police service in the area. We cannot anticipate how great this increase will be; we can only react as it occurs.

2. Such a project will obviously cause further traffic congestion on Kalanianaole Highway. As the preparation notice points out, "traffic volumes . . . are approaching capacity at several critical intersections." Many drivers would probably contend that the roadway's capacity has already been exceeded. Therefore, we urge that planning for this project include ways to compensate for the increased volume of traffic on the highway.

Thank you for allowing us to comment on this matter.

Sincerely,

DOUGLAS G. GIBB
Chief of Police

By Warren Ferreira
WARREN FERREIRA
Deputy Chief of Police

JUN 17 1985

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Chief Douglas G. Gibb
Honolulu Police Department
1455 South Beretania Street
Honolulu, Hawaii 96814

Dear Chief Gibb:

We are in receipt of your department's comments dated June 10, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

1. The requirement for additional police manpower can best be evaluated on the phasing schedule for project implementation. A project of this size will by necessity, take a period of several years and it is felt that protective services such as police can maintain required capacity as project scheduling takes place. We appreciate your concerns that result in long range planning and CIP projections for increased manpower and physical plant.

2. Traffic generation and the mitigative measures that are proposed to alleviate this added impact attributable to the proposed project's traffic generation onto the Kalanianaole Highway are discussed in extensive detail by the retained traffic consultant, Wilbur Smith & Associates. Please be assured that this consideration and the impacts from added traffic generation are of vital concern to Hawaii Kai.

We look forward to your department's comments on the draft EIS. Thank you for your continuing interest and concerns.

Yours very truly,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RUSSELL L. SMITH, JR.
DIRECTOR AND CHIEF ENGINEER

ENV 85-132

June 10, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Re: Environmental Impact Statement Preparation Notice for the Proposed Marine Zoning Project
Hawaii Kai, Honolulu, Oahu, Hawaii

We are responding to your letter of May 31, 1985, requesting comments for the proposed project.

1. The proposed project is located within the tributary areas of the Hawaii Kai sewerage system. The owner(s) of this privately operated system will be responsible for any necessary relief sewers.

2. Municipal refuse collection services may be available for apartment buildings provided refuse is placed in three (3) cubic yard bins. These bins will be collected at no charge by the City if direct access to bins is provided along with turnarounds within the property. If direct access and turnarounds cannot be provided, private collectors must be hired.

Very truly yours,

RUSSELL L. SMITH, JR.
Director and Chief Engineer

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Mr. Russell L. Smith, Jr.
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Smith:

We are in receipt of your department's comments dated June 10, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond as follows:

1. Sewerage systems required to accomodate the increased flow developed by the proposed 2400 units are anticipated to be adequately provided by existing master sewerage lines in place. Additional interceptor lines are to be designed in accordance with City & County standards suitable for dedication if necessary. Treatment will be done at the East Honolulu Community Services, Inc. Sewage treatment plant in accordance with existing requirements for treatment and disposal.

2. Requirements for municipal refuse collection indicated in your letter have been provided to the applicant and will be reviewed by both developer and architectural consultants. Compliance will be provided for either municipal collection or private systems.

Thank you for your comments and we look forward to your department's comments on the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

FRANK F. FASI
MAYOR

ALVIN K. H. PANG
DIRECTOR

June 18, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: Chapter 343, Hawaii Revised Statutes
Environmental Impact Statement Preparation Notice
Project: Marina Zoning, Hawaii Kai, Oahu
TMK: 3-9-08: Various Parcels
Area: 97± Acres
Existing Land Use: Vacant Land
Development Plans: Low and Medium Density Apartments
Zoning: Agriculture, Preservation and R-6 Residential
Proposal: Rezoning proposal for approximately 97± acres with approximately 2,400 residential units to be constructed over a period of seven years. Current Development Plan designates subject parcels (7) as either low or medium density apartment use. Rezoning request from existing R-6, P-1 and AG-1 to A-1 and A-2 apartment use. Developer (Kaiser) intends to build market quality apartment housing units.

Thank you for the opportunity to review and comment on the proposed rezoning application for the Marina project at Hawaii Kai, Oahu.

The plans, programs and projects of the Department of Housing and Community Development include the participation of private developers in providing housing for the low- and moderate-income families. The assistance of private developers is essential to alleviating the demand for affordable housing units.

As a condition to the approval of the proposed rezoning request, we recommend that the developer be required to set aside ten (10) percent of the units priced within the range of the low- and moderate-income families. This requirement applies to all zone change, cluster and planned development-housing application. Establishing such a request is

a reasonable means of recapturing the economic benefit conferred by favorable land use allocations and distributing that benefit for the general public benefit.

We are currently reviewing our policy relating to the ten (10) percent set aside and will inform you of any specific policy adjustment we adopt.

We would welcome the opportunity to assist the developer in formulating a program to provide these units. Please have the developer contact Mr. James Miyagi of this Department at 523-4264.

Thank you for bringing this application to our attention.

Sincerely,

for ALVIN K. H. PANG

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Mr. Alvin K.H. Pang, Director
Department of Housing and Community
Development
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Pang:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following: Your department's policy on requiring an affordable housing committant in connection with upzoning is understood. The developer has begun and will continue the process of working with your department to reach an appropriate affordable housing committant in connection with this pending zoning application.

Thank you for your comments and we look forward to your review of the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
KAMAMALU BUILDING, 250 SOUTH KING ST, HONOLULU, HAWAII
MAILING ADDRESS: P.O. BOX 2359, HONOLULU, HAWAII 96804 • TELEX: X00250 HGPED

GEORGE R. ARIYOSHI
GOVERNOR
KENT M. KEITH
DIRECTOR
MURRAY E. TOWILL
DEPUTY DIRECTOR
LINDA KAPUNIAI ROSEHILL
DEPUTY DIRECTOR

DIVISIONS
BUSINESS AND INDUSTRY DEVELOPMENT DIVISION
ENERGY DIVISION
FOREIGN TRADE ZONE DIVISION
LAND USE DIVISION
PLANNING DIVISION
RESEARCH AND ECONOMIC ANALYSIS DIVISION
OFFICES
ADMINISTRATIVE SERVICES OFFICE
INFORMATION OFFICE

Ref. No. P-1867

June 18, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Subject: EISPN for the Proposed Marina Zoning Project at Hawaii Kai, Oahu

We have reviewed the subject environmental impact statement preparation notice (EISPN) and have the following comments.

The draft EIS should evaluate the traffic impacts to Kalanianaole Highway caused by this project and other proposed projects. The Oahu Metropolitan Planning Organization's Hali 2000 Study indicates that Kalanianaole Highway would have undesirable levels of congestion and delays at morning peak hour travel under six different alternatives including a transportation system management alternative. The draft EIS should also assess the relationship of the proposed project to the relevant objectives and policies of the Hawaii State Plan and State Functional Plans.

Thank you for the opportunity to review and comment on the subject preparation notice.

Very truly yours,

Murray E. Towill
for Kent. M. Keith

cc: Office of Environmental Quality Control

ENVIRONMENTAL COMMUNICATIONS INC.

F. J. RODRIGUEZ,
PRESIDENT

July 1, 1985

Mr. Kent M. Keith, Director
Department of Planning and Economic Development
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Keith:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following: Traffic will be addressed in the Traffic Study provided by the consultant, Wilbur Smith & Associates. The Hali 2000 Study has been reviewed and mitigative measures to relieve congestion attributable to the additional units proposed are identified.

The proposed project's relationship with the State Plan and State Functional Plans will be incorporated into the Draft EIS.

Thank you for your comments and we look forward to your review of the Draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY
P. O. BOX 17907
HONOLULU, HAWAII 96817

[redacted]
EXECUTIVE DIRECTOR

IN REPLY REFER

TO: 85:DEV/3064

June 5, 1985

Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Gentlemen:

Subject: Environmental Impact Statement - Marina Zoning Project at Hawaii Kai, Oahu

The Authority has reviewed subject EIS and has no comments to offer relative to the proposed action at this time.

Thank you for allowing us to comment on this matter.

Sincerely,

Russell N. Fukumoto
Executive Director

NO RESPONSE NEEDED

GEORGE R. ARIYOSHI
GOVERNOR

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

WAYNE J. YAMASAKI
DIRECTOR

DEPUTY DIRECTORS
JONATHAN K. SHIMADA, Ph.D.
WALTER T. M. HO
CHERYL D. SOON
ADAM D. VINCENT

IN REPLY REFER TO

STP 8.10674

June 18, 1985

Mr. F.J. Rodriguez
President
Environmental Communications, Inc.
1146 Fort Street Mall, Suite 200
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Marina Zoning Project
Hawaii Kai, Oahu
EIS Preparation Notice

We concur in the City Department of Land Utilization's determination that an environmental statement is required.

We look forward to reviewing the traffic analysis based on a traffic management program consisting of roadway modifications and ridesharing measures. The analysis should also include a scenario without the ridesharing measures.

Very truly yours,

for Wayne J. Yamasaki
Director of Transportation

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL COMMUNICATIONS INC.

July 1, 1985

Mr. Wayne J. Yamasaki, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Yamasaki:

We are in receipt of your comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice. We respond in the following:

The traffic consultant, Wilbur Smith & Associates has been provided with a copy of your request for the different scenarios with and without the ridesharing measures.

Thank you for your comments and we look forward to your review of the draft EIS.

Very truly yours,

F. J. Rodriguez

F. J. Rodriguez

FJR:la

1146 FORT STREET MALL, SUITE 200 • P.O. BOX 3379 • HONOLULU, HAWAII 96801 • (808) 537-3811

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

CHARLES G. CLARK
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
EPHSD-

June 18, 1985

Mr. F. J. Rodriguez
Environmental Communications, Inc.
P. O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

Subject: Request for Comments on Environmental Impact Statement Preparation Notice for the Proposed Marina Zoning Project at Hawaii Kai

Thank you for the opportunity to review the Marina Zoning proposal which involves the development of 2,400 residential apartment units at seven sites in the Hawaii Kai area.

The Environmental Impact Statement should fully describe the sources or alternate sources of potable water for the seven sites and the quantity of water required for each area. In light of recent water shortages, the size and location of this proposal makes availability of water a critical issue. There are no potable water sources in the Hawaii Kai area. The current 8,000 plus residential units in the Hawaii Kai area receive potable water from the Board of Water Supply's Honolulu or Windward sources. Honolulu has been designated as a groundwater control area because water usage from Honolulu sources is rapidly approaching the sustainable yield of the aquifer. Pumpage limits have been identified and set for each Honolulu groundwater source. The sponsors of the project will need to consult both the Division of Water and Land Development of the Department of Land and Natural Resources, and the Honolulu Board of Water Supply about the availability of water for the Hawaii Kai Marina Project.

Please be advised that any new source of potable water developed to serve the project would be subject to approval by the Director of Health prior to its use as a potable water source. The new source and distribution system must comply with all applicable terms and conditions of Chapter 20, Title II, Administrative Rules.

Careful consideration should be given to the potential for cross-connections between potable and nonpotable waterlines especially in the highrise buildings. In areas of potential contamination, proper backflow prevention devices should be installed on internal plumbing fixtures.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

JUN 20 1985

F. J. RODRIGUEZ,
PRESIDENT

ENVIRONMENTAL COMMUNICATIONS INC.

July 1, 1985

Mr. Melvin K. Koizumi
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

We are in receipt of your department's comments dated June 18, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

Water source development for the proposed project will be coordinated with the Board of Water Supply as the lead agency and the Department of Land & Natural Resources as the consulted agency of record. We will also be in contact with your agency for compliance with Chapter 20, Title 11, Administrative Rules.

Your concerns on potable and non-potable sources of water and possible cross connection are being reviewed by the developer and their architects to insure that in the event this may take place, adequate controls are initiated to prevent any contamination.

Thank you for your continuing concern and we look forward to your comments on the draft EIS.

Yours very truly,

F. J. Rodriguez

FJR:ls

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

June 14, 1985

Mr. Fred J. Rodriguez
Environmental Communications
P.O. Box 536
Honolulu, Hawaii 96809

Dear Mr. Rodriguez:

EIS Preparation Notice
Hawaii Kai Marina Zoning Project
Honolulu, Oahu

The above cited preparation notice was reviewed by Jacquelin Miller of the Environmental Center. The following comments are offered for your consideration in the preparation of the Environmental Impact Statement.

Traffic

The proposed rezoning of several parcels (97 + acres), in the Hawaii Kai Marina area to permit approximately 2,400 residential units will result in considerable increase in the traffic on Kalananaole Highway and adjacent streets. We note that the increase in traffic on Kalanianaole Highway is to be analyzed in the EIS. We call attention to the need for analysis of increase in traffic on the tributary streets also. At the present time the left turn entry into Kuapa Kai Shopping Center by cars traveling makai is hazardous due to the short sight distance of cars coming over the hill traveling mauka. The intersection at Hawaii Kai Drive and Keahole Street is particularly hazardous and several accidents have occurred at that intersection. Similarly, the intersection of Wailua Street and Hawaii Kai Drive is hazardous at peak hours and will certainly be more so with the addition of the traffic from the 2,400 units. The DEIS should discuss appropriate measures to mitigate the increased traffic risks.

Pedestrian/Bicycle Safety

We also call attention to the need for an extension to the outside of the Keahole Street Bridge for pedestrians and bicycle use. The present sidewalk area is very narrow, the number of joggers and bicyclists is great, and the potential for accident on that bridge extremely high. Since Keahole Street will bear the major impact of this development, consideration should be given for ways to improve the existing hazardous conditions, lest they become critical with the added traffic.

Archaeological Sites

The preparation notice states that there are no known historical or archaeological sites of significance in the area. The description provided and figure 2 indicates that the proposed area will include construction on the mauka side of Hawaii Kai Drive between the Post Office and the existing Pacific Islands Club (formerly Hawaii Kai Recreation Center). There are a number of archaeological sites in that area, particularly the area just Koko Head of the Pacific Islands Club. We believe the Bishop Museum has conducted work there and should be consulted. It is our understanding that rock walls, house sites, and a well are present on the site.

Constructon Impacts

We note that construction is likely to take 7 years. One of the more serious concerns will be the dust problems during the initial ground preparation stages. Because of the prevailing strong trade winds in this area, and the fine texture of the dredged spoil fill surface material, fugitive dust has been a serious problem during previous construction periods. We suggest that the EIS address this issue and the mitigation measures that will be employed.

Special attention should be given to avoid pollutants entering the marina during the construction phase. Past experience has indicated that inadequately controlled runoff from freshly graded areas produces significant silting in the marina. Washdown of construction equipment, including on occasion concrete trucks and paint sprayers, has resulted in pollutants entering the marina through the storm drains.

Since most of the marina frontage houses are built on compacted fill, it is especially important to minimize blasting or pile driving. If either type of construction operation is anticipated, a soils engineer should be consulted for potential effects on nearby structures.

We appreciate the opportunity to comment on this preparation notice and look forward to receipt of the Draft EIS.

Yours truly,

Doak C. Cox
Director

cc: OEQC
Jacquelin Miller

ENVIRONMENTAL
COMMUNICATIONS
INC.

F. J. RODRIGUEZ
PRESIDENT

July 1, 1985

Dr. Doak C. Cox, Director
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Dr. Cox:

We are in receipt of your office's comments dated June 14, 1985 on the Hawaii Kai Marina Zoning Environmental Impact Statement Preparation Notice and we respond in the following:

1. Traffic - The applicant's traffic consultant, Wilbur Smith & Associates have prepared a comprehensive traffic impact study on the traffic generated from the proposed project as well as measures proposed to mitigate this added traffic load on Kalanianaole Highway along with key tributary streets within Hawaii Kai.

   Responses to your specific concerns are as follows:

   A. There is a traffic signal at the entrance to Kuapa Kai Shopping Centers to control/stop thru traffic to allow both left turns into and left turns out of the center. The location and design at this traffic control signal is in conformance with applicable design standards.

   B. The intersection at Hawaii Kai Drive and Keahole Street is a problem. The City & County is planning to install traffic control signals at this intersection by the end of 1985. Further, the Transportation Management Study has proposed realignment of this intersection to further improve its safety.

   C. The intersection at Wailua Street and Hawaii Kai Drive could be improved. The City & County is planning to install traffic control signals at this intersection also. The Transportation Management Study found that with the signal, the intersect would be adequate for the additional traffic from the Marina Zoning project.

2. Pedestrian/Bicycle Safety - Keahole Street Bridge has a 4' wide sidewalk on the Diamond Head side and an 8' wide sidewalk on the Koko Head side. Your concern will be forwarded to the City & County Department of Transportation Services for their review.

3. Archaeological Sites - A field survey has been done as part of this EIS with the results to be included in the draft EIS. Where sites are located in areas to be developed, they will be reviewed with the State

   Historic Preservation Office. If sites are located that meant preservation, development of the area will be controlled/limited to insure their preservation. The 5 acre area, "just Koko Head of the Pacific Islands Club" is not included in the Marina Zoning project but was included in the field survey to get a complete report for the area. A site meriting preservation was located in the 5 acre site (also extending into development tract Kaluanui 2 & 3) and restoration and preservation activities are under way.

4. Construction Impacts - are to be discussed in the draft EIS and we have added our concerns to those expressed in your comments to the developer. Hawaii Kai will coordinate the various impacts of fugitive dust, surface runoff, and possible blasting or pile driving with the architectural consultants as well as the construction contractors.

Thank you for your continuing concern and we look forward to your comments on the draft EIS.

Yours very truly,

F. J. Rodriguez

F. J. Rodriguez

FJR:ls

Environmental Communicatons, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

June 3, 1985

Re: Marina Zoning Project
Hawaii Kai, Oahu

Dear Ladies and Gentlemen:

Thank you for your letter of May 31, 1985, advising that an Environmental Impact Statement Preparation Notice has been filed with the Office of Environmental Quality Control of the State of Hawaii.

I am a recently re-elected member of the Hawaii Kai Neighborhood Board No. 1, and an active member of the Board's Transportation Committee, and represented the Board in a liason capacity with the Kaiser Developement Company.

I wish to emphasize the urgent need for improvement in items of traffic system management along the entire length of Kalanianaole Highway between Hawaii Kai and the H-1 freeway at Waialae. Additionally, physical improvements must be made on Kalanianaole Highway, prior to any further development commencing in Hawaii Kai.

Virtually no additional improvements have been made to the Kalanianaole traffic corridor prior to the present development in upper Kalama Valley, Kamehame Ridge, upper Kamiloiki Valley, development of additional commercial activity in the Kuapa Kai Shopping Center, development of upper Kuliouou Valley for affordable housing, construction of the new Maunalua Bay Club makai of Aina Haina, and continuing high enrollment at Kalani High School, and new development on Hawaii Loa Ridge.
Some of the items that are much-needed, and which have been repeatedly discussed at transportation forums, community meetings, Neighborhood Board meetings, developers' familiarization meetings, etc., but which have yet to be implemented and/or constructed are:

1. A pedestrian bridge over Kalanianaole Highway, fronting Kalani High School, preferably not near any of the exisiting traffic signal lights.

2. Adjustments to the timing of the three sets of traffic lights at Laukahi St., Kalani-Iki St., and Ainakoa Ave., at Kalanianaole Highway; extending the "synchronized timing" of the 6:30am to 8:30am traffic period to a "round-the-clock" basis. Much of the aggravation for drivers occur during so-called "off-peak" hours, wherein only one car coming down any one of these three streets to Kalanianaole Highway is now able to trigger the traffic lights, stopping dozens of vehicles on Kalanianaole Highway. The very persons wishing to minimize congestion during peak hours are now being penalized by minority traffic flow from side streets, and by pedestrians pressing the crosswalk light switches for "their convenience."

There are certain intersections at which the banning of left-turns, at all hours will improve traffic safety on Kalanianaole Highway. Some of these situations are: 1) The banning of all left-hand turns from Kalanianaole Highway into Hawaii Loa Ridge; 2) The banning of all left turns into Hawaii Loa Street in Niu Valley; 3) The banning of all left turns directly into the parking lot of the Niu Valley Shopping Center; 4) The banning of all left turns at Elelupe Road, and Kawaihae Street, until adequate left-hand deceleration and storage lanes can be created.

The additional development in Hawaii Kai should not be permitted until the above-described highway improvements are made. These improvements should be made prior to the major construction improvements to Kalanianaole Highway by the State DOT.

The "jug-handle" left-turn arrangement for Hawaii Loa Ridge should be implemented as soon as possible.

Additional pedestrian overpasses over Kalanianaole Highway should be constructed in Aina Haina, Niu Valley, and at the Holy Trinity Church.

In poll after poll of Hawaii Kai Residents, the traffic congestion along Kalanianaole Highway has been cited as the problem most needing rectification. This overall concern is greater than general community concerns about crime, housing, employment, ground lease rent problems, schooling, water and sewer services, electrical power dependability, and all other aspects of life in Hawaii Kai.

Yours sincerely,

Quincy H. Kaneshiro
612 Kapaia Street
Honolulu, Hawaii 96825
Tel: 395-8314

cc: Senator Buddy Soares
Representative Donna Ikeda
Representative Hal Jones
Councilmember Welcome Fawcett
Wayne Yamasaki, Director, State DOT
Bina Chun, Kaiser Development,
Director of Public Relations

QHK:djas