

Office of Environmental Quality Control
Office of the Governor
550 Halekaiwila Street
Tani Office Building, Third Floor
Honolulu, Hawaii 96813

REVISED

ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROPOSED IMPROVEMENTS OF
HAMAKUA DRIVE AND RELATED STREETS
SERVING THE KEOLU - ENCHANTED LAKE AREA
KAILUA, KOOLAUPOKO, OAHU, HAWAII



Frank F. Fasi
Mayor

DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

May 12, 1978

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
630 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Proposed Improvements of Hamakua Drive and Related
Streets Serving the Keolu-Enchanted Lake Area, Kailua,
Koolau-poko, Oahu

Based upon the recommendation of the Office of Environmental Quality Control, I am pleased to accept the subject document as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes, and the Executive Order of August 23, 1971. This environmental impact statement will be a useful tool in the process of deciding whether or not the action described therein should or should not be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws, and does not constitute an endorsement of the proposed action.

When you make your decision regarding the proposed action itself, I hope you will weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and, together with the comments made by reviewers, will provide you with a useful analysis of alternatives to the proposed action.

With warm personal regards, I remain,

Yours very truly,


George H. Ariyoshi

cc: ✓ Mr. Richard L. O'Connell

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CITY AND COUNTY OF HONOLULU

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KAILUA, KOOLAUPOKO, OAHU, HAWAII
TAX MAP KEY: 4-5-39, 76; 4-2-01 AND
4-2-52, 39

This Environmental Document is Submitted
Pursuant to Chapter 343, HRS

Proposing Agency: Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Accepting Authority: Governor, State of Hawaii
Mayor, City & County of Honolulu

Responsible Official: Wallace Miyahira 2/3/78
WALLACE MIYAHIRA Date
Director & Chief Engineer

Prepared By
Director and Chief Engineer's Office
Department of Public Works

TABLE OF CONTENTS

	<u>Page</u>
I. Summary	I-1
II. Projects Descriptions	
A. Introduction and Background	II-2
B. Objectives	II-13
C. Technical Characteristics	II-15
1. Hamakua Drive Improvements	II-16
2. Kailua Road Improvements	II-17
3. Wanaao Road Improvements	II-20
4. Other Improvements	II-22
5. Kailua Bikeway System	II-26
6. Proposed Widening of Hamakua Drive	II-29
7. Traffic Assignment	II-31
D. Social-Economic Characteristics	II-36
E. Environmental Characteristics	II-42
F. Funding and Project Schedule	II-45
III. Description of Environmental Setting	
A. Location	III-1
B. Physical Characteristics	III-6
1. Climate	III-7
2. Soil Survey and Borings	III-8
C. Archaeological and Historic Sites	III-14
D. Fish and Wildlife	III-20
E. Flora	III-28
F. Flood Control	III-37
IV. Land Use Relationship	IV-1
V. Environmental Impact of the Proposed Actions and Proposed Mitigation Measures	
A. Introduction	V-1
B. Construction	V-2
C. Relocation	V-8
D. Social and Economic	V-8
E. Flood Hazard	V-11
F. Stream Modification	V-11
G. Wetlands	V-13
H. Water Quality	V-15
I. Natural Ecological System	V-24
J. Noise	V-27
K. Air Quality	V-34

TABLE OF CONTENTS - 2

	<u>Page</u>
VI. Alternatives To The Proposed Actions	VI-1
A. Do Nothing Alternative	VI-1
B. Road Width Alternative	VI-5
C. Alignment Alternative	VI-12
D. Bridge Structure Alternative	VI-13
E. Road Improvement Alternative	VI-14
F. Upgrading Existing Roads Alternative	VI-18
G. Mass Transit Alternative	VI-19
H. Existing Hamakua Drive Alternative	VI-21
VII. Unavoidable Adverse Impact	VII-1
VIII. The Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity	VIII-1
IX. Commitments of Resources	IX-1
X. Governmental Policies Offsetting Adverse Effects	X-1
XI. Identification of Agencies Consulted	XI-1
XII. Agencies and Individuals Consulted On The Preparation Of The EIS	XII-1
XIII. Reproduction and Responses	XIII-1
XIV. Summary of Unresolved Issues	XIV-1
XV. Permits and Approval Required	XV-1
XVI. Comments on the EIS	XVI-1

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
I-1	Location Map	I-4
II-1	Improvement of Hamakua Drive	II-18
II-2	Kailua Road Improvement District	II-19
II-3	Wanaao Road Improvement District	II-21
II-4	Existing and Proposed Drains	II-23
II-5	Existing and Proposed Right-of-Way Keolu-Enchanted Lake	II-24
II-6	Recommended Street Right-of-Way Keolu-Enchanted Lake	II-25
II-7	Portions of Kaneohe-Kailua Bikeway System	II-28
II-8	Proposed Widening of Hamakua Drive	II-30
III-1	Hydrogeologic Data For Oahu	III-9
III-2	Monthly Wind Velocity and Direction Frequency Diagrams	III-10
III-3	Portion of Soil Survey Map For Kailua, Maunawili and Lanikai, Oahu	III-13
III-4	Portion of Proposed Flood Hazard District for Kaneohe-Kailua	III-43
IV-1	Portion of State Land Use District Map for Kailua, Koolaupoko, Oahu	IV-2
IV-2	Portion of General Plan for Kailua, Lanikai, Maunawili, and Waimanalo, Oahu - 1964	IV-3
IV-3	Portion of Detailed Land Use Map For Kailua, Lanikai, Maunawili, and Waimanalo - 1964	IV-4
V-1	Water Quality Sampling Stations	V-17
VI-1	Typical Street Cross-Sections	VI-3

LIST OF FIGURES - 2

<u>Figure</u>	<u>Title</u>	<u>Page</u>
VI-2	Typical Street Cross-Section View for 80-Foot Right-of-Way Alternative Kailua Road	VI-4
VI-3	Recommended Street Cross-Section For 56-Foot Right-of-Way Alternative Kailua Road and Wanaao Road	VI-6
VI-4	Alternative Right-of-Way Width, Kailua Road, From Hahani Street To Wanaao Road	VI-8
VI-5	Recommended Street Cross-Section View For 70-Foot Right-of-Way Alternative, Hamakua Drive, Hahani Street to Akoakoa Street	VI-9
VI-6	Recommended Street Cross-Section View For 80-Foot Right-of-Way Alternative, Hamakua Drive, Kailua Road to Hekili Street	VI-22

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
III-1	Fish and Wildlife Resource In The Environs Of The Proposed Hamakua Drive Connection	III-23
III-2	Plant Species Found Adjacent To Kailua Road, Hahani Street To Wanaao Road Junction	III-30
III-3	Plant Species Found Adjacent To Wanaao Road, Kailua Road Junction To Auwina Street	III-31
III-4	Plant Species Found Adjacent To Awakea Road, Wanaao Road To Ka Awakea Road	III-32
III-5	Plant Species Found In Kaelepulu Marsh, Hamakua Drive Connection	III-34
V-1	Water Quality Data, Kawainui-Kaelepulu Streams	V-22
V-2	Pesticides and Heavy Metals Analysis Hamakua Bridge Crossing At Kawainui Stream	V-23
V-3	Impact Of Traffic On Noise Level On Selected Receptors With And Without Improvements	V-32
V-4	Impact Of Traffic On Carbon Monoxide (CO) Concentration On Selected Receptors Without Improvements	V-41
V-5	Impact Of Traffic On Carbon Monoxide (CO) Concentration Selected Receptors With Improvements	V-42
V-6	Wind Direction And Velocity Occurrence Kailua, Koolaupoko, Oahu	V-43
VI-1	Summary Evaluation Of Road Network Systems	VI-23

I. SUMMARY

A. Description of the Proposed Actions

The purpose of the proposed actions is to alleviate present and/or future traffic congestion, and promote safety along present and proposed approaches into the Keolu-Enchanted Lake area. Traffic movements during the morning and afternoon peak-hours are being or will be affected along the inadequate and unimproved portions of Wanaao Road, Kailua Road, and Awakea Road. These unimproved sections consist of two traffic lanes in existing right-of-way (R.O.W.) of 40 feet. The lack of curbs, gutters, sidewalks and drainage facilities in these sections create certain hazards to motorists and pedestrians alike. During heavy storms, for example, Kailua Road between Wanaao Road and Hahani Street is nearly impassable and traffic movements are sorely restricted.

Between 1971 to 1976-77, the daily traffic counts on the affected existing access roads have increased substantially especially along Kailua Road. The total number of vehicular trips on Kailua Road increased from 8,442 to 18,429.

Elsewhere, the increases were from 6,951 to 11,134 trips on Wanaao Road and from 10,719 to 14,782 trips on Keolu Drive - Kalaniana'ole Highway.

Several alternative solutions are available to facilitate traffic to and from the Keolu-Enchanted Lake area. One

fully improved access is presently available by way of Keolu Drive and Kalaniana'ole Highway which is the primary arterial between Waimanalo-Kailua to the Pali-Kamehameha Highways at Castle Junction. The other existing accesses through Kailua Road are by way of the unimproved portions of Wanaao Road, and Ka Awakea Road via Awakea Road and Wanaao Road. Both accesses include a bridge over the improved portions of Kawainui Stream (Kaelepulu Stream).

Two new accesses are shown on the General Plan as amplified in the Development Plan and the Detailed Land Use Map for the area. They include the extension of Hamakua Drive from the Kailua industrial area to Keolu Drive and the extension of Ulumanu Drive from the Pohakupu Tract across Kailua High School to Keolu Drive. The status of these two extensions indicate that some progress has been made. Hamakua Drive has been extended in recent years from Hekili Street to Hahani Street on the Kailua Town side and from Keolu Drive to Akoakoa Street on the Enchanted Lake side leaving a gap of about 1850 feet in between. Work on the Ulumanu Drive extension has been proceeding as part of the development of Akiohala Street from Keolu Drive leaving a gap of about 2,400 feet. Plans for a two-lane road to the boundary of Kailua High School have been developed by the State and the road is under construction at this time (September 1977). The proposed road will not extend across the school grounds but will terminate in a cul-de-sac.

No further action is contemplated by the State and County on the extension of Ulumanu Drive across Kailua High School.

Therefore, the proposed action to facilitate traffic movements to and from the Keolu-Enchanted Lake area will consist of one or more projects identified as the improvements of (1) Kailua Road between Hahani Street to Wanaao-Awakea Road, (2) Wanaao Road from Awakea Road to Auwina Street, and (3) Hamakua Drive between Hahani Street to Akoakoa Street.

Kailua Road Improvements

The proposed improvements of Kailua Road from Hahani Street to Wanaao-Awakea Roads will consist of four traffic/parking lanes within a right-of-way (R.O.W.) width of 56 feet. The General Plan width is 80 feet. The improvements will include new 40-foot wide pavement, curbs, gutters, sidewalks, street lights, driveways, storm drains, sanitary sewer, and adjustment to the existing water line. Kailua Road is a major street in Kailua Town serving Keolu-Enchanted Lake, Kailua Beach Park and Lanikai. The General Plan width between Wanaao Road to Kailua Beach Park is 60 feet; however, this portion has not been proposed for improvement yet.

The proposed project is approximately 2,000 feet long and had once been initiated before in 1963 as a fully improved facility with a 64-foot pavement width within the 80-foot R.O.W. The proposed project was deferred at that time

because of controversy over the method of assessment and the destruction of some 30 Ironwood trees. Improvement of Kailua Road will provide on-street parking and better traffic circulation and safety, alleviate congestion and eliminate flooding.

Wanaao Road Improvements

The proposed improvements of Wanaao Road from Kailua/Awakea Roads to Auwina Street will consist of two traffic lanes within the R.O.W. width of 56 feet for a distance of approximately 1,900 feet. The General Plan R.O.W. is 60 feet.

The improvements will include new 40-foot wide pavement, curbs, gutters, sidewalks, driveways, street lights, storm drains, and adjustment to the existing sewer and water lines. The dangerous road curve at the junction of Wanaao and Kakahiaka may be replaced by a flatter curve.

Improvement of Wanaao Road will provide better traffic circulation and safety, alleviate congestion, and eliminate flooding. Wanaao Road from Auwina Street to Keolu Drive is a fully improved roadway within the 60-foot R.O.W.

Hamakua Drive Improvements

The proposed improvements of Hamakua Drive from Hahani Street to Akoakoa Street will consist of 4 traffic lanes and 2 bike lanes within the right-of-way width of 70 feet for a distance of approximately 1,850 feet. The General Plan R.O.W. is

80 feet. The improvements will also include a 210 feet long bridge structure over Kawainui Stream, curbs, gutters, sidewalks, street lights, water mains, storm drains, and adjustment to the existing sewer lines. The facility will be designed to meet the Federal 100-year flood level. At the bridge crossing, the unimproved portions of Kawainui Stream adjacent to the bridge piers will be improved to the master planned width of 107 feet. Curbs, gutters and sidewalks may not be installed initially as the intention is to keep this portion of Hamakua Drive as a limited access highway. Direct access by private driveways will not be permitted.

The proposed improvements will provide another access from Keolu-Enchanted Lake to Kailua Road, improve traffic circulation, and reduce congestions on other streets. It will also permit the development of presently vacant and unimproved lands zoned for industrial, apartment and residential uses. Both existing segments of the street are fully improved to its General Planned width of 80 feet.

Ulumanu Drive Improvements

The proposed General Planned improvements of Ulumanu Drive from Kailua High School to Keolu Drive by way of Akiohala Street at Akipola Street will not be implemented. As stated previously, the most recent plans consisting of a two-lane road terminating in a cul-de-sac at the Kailua High School

boundary meet the requirement of the State Department of Education.

The proposed roadway will provide a second access to the high school only. The proposed State plan is not consistent with the General Plan which would have provided for a direct access across Kailua High School to Kailua Road. Since traffic circulation requirements will be met elsewhere, the Development Plan will be amended.

Other Improvements

Other improvements fall in the category of stream, drain, roads, and bikeway improvements which will be either separate projects or part of the road improvements or subdivisions. Widening of the Kawainui Stream from its confluence with the main Kaelepulu Stream channel to the end of Auwina Street has been proceeding as part of the Enchanted Lake subdivisions. Likewise, partial improvements to the stream from Kailua Road to Hahani Street has been part of the industrial subdivisions. It is presumed that those portions of the stream not fully improved will be improved as a condition for approval of abutting subdivisions.

Storm drains improvements consist of the 60-inch Kailua Road drain into Kawainui Stream, the 48-inch drain off Wanaao Road into Kaelepulu Stream, the 54-inch drain off Kakahiaka Street and the 42-inch drain off Mahealani Place into Kaelepulu Stream.

One of the road projects in this category is the proposed widening

of Hamakua Drive from Kailua Road to Hekili Street. The proposed improvements in this segment will involve widening the existing 40-foot pavement to 64 feet within an 80-foot R.O.W. for a distance of 680 feet. None of the aforementioned projects are listed in the City and County Capital Improvement Program.

The bikeways improvements will include designating Keolu Drive loop as a bikeway (no construction necessary); widening the existing pavement on Awakea Road between Auwinala Road and Wanaao Road; providing bike lanes on Hamakua Drive; and pavement widening or paving shoulder on various other streets in the Kailua bikeway system.

B. Description of the Environmental Setting

The various proposed projects are located in the Windward Oahu community of Kailua. The urban areas consist predominately of single family residences, a few apartment developments and three shopping centers. Kailua is almost fully urbanized. Maunawili, portions of Keolu-Enchanted Lake, a periphery strip around Kawainui marsh and State lands at Olomana, are few areas which could be further developed. The 1975 population was about 41,000 people.

The climate is moderate and influenced by a prevailing trade wind from the north-northeast quadrant. Rainfalls is about 44 inches in Kailua Town and annual temperature is 75 degrees Fahrenheit. Soils belong to the Lualualei-Fill land - Ewa association along the coastal region and the Lolekaa - Waikane association in the higher elevations

and ridges.

The areas proposed for improvements are in the older developed sections of Kailua except for the Hamakua Drive connection which will be across the last remnant of the Kaelepulu marsh. The flora along Kailua, Wanaao and Awakea Roads are predominately cultivated and ornamental plants, characteristic of most rural urbanized area. The most conspicuous stands of trees consist of the ironwood along the makai side of Kailua Road. The surrounding area along the Hamakua Drive connection is fairly densely covered with vegetation, grasses, weeds, shrubs and mangroves. Fifty-four (54) taxads were found. No rare or endangered plants were found in the affected areas of Hamakua Drive, Kailua Road, Wanaao Road and Awakea Road.

Four native waterbirds use the marsh surrounding the Hamakua Drive connection as habitat. The Alae ula, Alae keokeo, Aeo and Koloa are endangered species. Three species of migratory birds and 10 species of exotic birds were also identified in the marsh.

Several native and exotic species of fishes were found in the unimproved or partially improved sections of Kawainui Stream. These species included freshwater-estuarine and marine fishes usually found in waterways connected to the

ocean. None of the species are endangered.

All of the affected areas of the proposed projects are affected by flooding to some degrees. The older Kaelepulu subdivision series along Kailua, Wanaao and Awakea Roads were developed without storm drains. As further urbanization occurred, the intensity of flooding increased. Consequently, Kailua Road between Wanaao Road and Hahani Street is severely inundated during heavy rainstorm. The unimproved portions of Wanaao and Awakea Roads are affected to a lesser degree.

The low-lying marsh along the unimproved and partially improved portions of Kawainui Stream is usually flooded during heavy down pours. Flooding of the marsh has beneficial effects on wildlife, particularly the valuable Aeo.

A potential ancient habitation site was discovered in the marsh by an archaeological research team near the proposed alignment of Hamakua Drive surrounded by agricultural plots and terrace walls. To the north/northwest of the proposed bridge crossing a "T" shaped site complex (possibly a Heiau) was observed.

C. Probable Impacts of the Proposed Projects and Mitigating Measures.

The proposed actions will have several impacts on the physical and social environments of the affected areas. These impacts include beneficial and adverse impacts, short and long term impacts, and primary and secondary effects. Construction impacts will be short term, direct and indirect, and will have primary and secondary effects. Filling, grading, excavation, excessive noise, exhaust emission, dredging, and traffic disruption will be experienced during construction. Adverse impacts from these activities are usually unavoidable.

Some of the mitigative measures which will be employed include: for dust-watering and applying dust palliative; for trench dewatering-recharging ground water into the ground or using silting basins; for erosion control - limiting work area and by planting; dredging - using silt screen and scheduling construction during the dry season; for traffic disruption - keeping one lane open, limiting work hours, plating of trenches, rerouting buses, maintaining warning lights, signs, etc., employing off-duty police officers; for excessive noise - limiting work hours and working days; and exhaust emission - limiting work hours. Dredging of Kawainui Stream will have an adverse secondary effect since it will eliminate flooding of the abutting marsh. Periodic flooding of the marsh is considered essential for the existing wildlife, especially the Hawaiian stilt (Aeo).

Long term impacts will vary with each of the different project. Assuming that Hamakua Drive, Kailua Road and Wanaao Road were built as recommended by the Department of Transportation Services, we can anticipate the following impacts.

Traffic demands will be decreased on Kailua and Wanaao Roads, but traffic will increase on the existing portions of Hamakua Drive. Air quality and noise level will be improved on Kailua and Wanaao Roads; however, air quality will be degraded and noise level will be increased on Hamakua Drive.

Construction of Hamakua Drive will drastically change the land form of the marsh. Eventually, the adjoining marsh will be urbanized and wildlife habitats will be destroyed unless the area is downzoned.

Construction of the various storm drainage systems will eliminate flooding on Kailua Road, Wanaao Road and the other streets in the old Kaelepulu subdivision series. Widening and improving Kawainui Stream will eliminate flooding in the marsh. Conversely, it will adversely alter the water interchange relationship between the stream and the marsh which is vital to the survival of the Aeo's habitats.

Water quality, fish and benthic organism in Kawainui Stream are not expected to be adversely affected because of the channel improvements.

Providing bikelanes on Hamakua Drive and other streets will stimulate bicycling activities and conserve energy. Bike improvements will provide for a safe and convenient form of recreation also.

D. Alternatives To The Proposed Projects

Seven (7) major categories of alternatives were considered in the evaluation of the proposed actions. The categories included the Do Nothing Alternative, Road Width Alternative, Alignment Alternative, Bridge Structure Alternative, Road Improvement Alternative, Upgrading Existing Roads Alternative and Mass Transit Alternative.

After the evaluation of the various alternatives, modification of the major road projects were made as appropriate. The general planned road widths of Hamakua Drive, Kailua Road and Wanaao Road were reduced to 70 feet, 56 feet and 56 feet, respectively. It was decided not to proceed with the implementation of the Ulumanu Drive extension across Kailua High School.

Wanaao Road from Awakea Road to Auwina Street, and Awakea Road from Ka Awakea to Wanaao Road can be improved within their present 40-foot R.O.W. The adoption of the mass transit alternative was not found to be viable in place of street improvements because of the lack of sufficient equipment and the disruption of traffic caused by buses on the existing narrow streets.



II. PROJECTS DESCRIPTION

A. Introduction and Background

Kailua is located in Windward Oahu in the judicial district of Koolaupoko. It is located approximately 12 miles from Honolulu, the capital on the Leeward side. Koolaupoko refers to the short portion of the windward side of the island. Historically, Kailua (two seas) was the ancient capital of the kings of Oahu and was densely populated prior to Captain Cook's arrival. Large freshwater fishponds belonging to the alii existed at Kawainui and Kaelepulu in addition to the salt water ponds at Mokapu (Nuupia Ponds). Summers (1964) reported that Kawainui Pond had an area of about 450 acres and abounded with fat mullet and other fishes. Cobb (1901) listed Kaelepulu Pond with an area of 216 acres and Nuupia Pond with 215 acres. According to Summers, Kawainui and Kaelepulu Ponds were interconnected by a stream (Kawainui Stream) and connected to the ocean by way of the Kaelepulu Stream.

Coconut Grove in Kailua once served as the royal residence of one of the Oahu's kings in the 15th century. Coconut Grove as the name implies was once densely covered with coconut trees up to the mid 1940s. Kailua was a sleepy country town of

3,000 people in the 1940s. Today, it is the second largest town (city) in the State with a population of about 41,000 people in 1975. The most dramatic population increase took place between 1950 and 1960 after the Pali and the Likelike highways were completed. During this period, Kailua registered a gain of 16,300 new people. Since 1970, the population growth rate has slowed down considerably and only 2,000 new residents were gained by 1975.

In the 1950s, following World War II, there was a construction boom for single family residences in Windward Oahu, beginning at Kaneohe first and later at Kailua on Kaneohe Ranch (Castle Estate) lands. The majority of the homes that were built were on leased lands. One of the first largest subdivisions where fee-simple house and lots were sold was the Keolu Hills Tract beginning in 1949.

This was followed a few years later in 1957 by the Kailua Heights Tract situated adjacent to the Keolu Hills subdivision. Approximately 440 houselots were sold on fee-simple lands. Another 200 lots were developed in the same area in the early 1960s also as fee-simple.

Numerous other housing tracts were being developed on Kaneohe Ranch and Bishop Estate lands elsewhere. Around 1952, the Kaelepulu Subdivision, consisting of about 220 lots, were developed along Kailua Road, Wanaao Road and adjacent streets. In the mid 1950s, Kalaheo Hillside, adjacent Kaneohe Ranch lands around Mokapu Boulevard, and between the south bank of Oneawa Channel to Kalama Street, were developed. This was followed in 1957 by the construction of Pohakapu Tract with 300 house lots, Olomana Tract with 250 lots and Kukonono Tract with about 130 lots.

The basic road network for Keolu-Enchanted Lake has undergone some modifications since it was adopted in 1952. The 1952 master plan provided for the extension of Wanaao Road with an 80-foot R.O.W. through Keolu Hills to the proposed realigned Kalaniana'ole Highway to Waimanalo. Due to the interest and subsequent development of Enchanted Lake which required extensive filling, the City Planning Department after careful study decided to reduce the R.O.W. of Wanaao Road from 80 feet to 60 feet. The downgrading of Wanaao Road to a secondary road was to prevent the funneling of Keolu-Enchanted Lake traffic through Kailua Town which was undesirable because it would cause problems.

The recommended 1959 road network planned for the Keolu-Enchanted Lake area consisted of four access roads. The plan included the following main components:

1. The present Keolu Drive (Wanaao Road now);
2. Keolu Drive extension to Kalaniana'ole Highway;
3. A connection from Keolu Drive to the high school; and
4. A connection from Keolu Drive to Kailua Road along the base of Puu O Ehu ridge (Hamakua Drive).

Hamakua Drive was intended to serve the apartment and industrial areas that were considered at that time. Forty (40) acres for apartment use was contemplated. The proposed Hamakua Drive would provide access for Keolu-Enchanted Lake residents to the Kailua Shopping Center and also serve as a truck route for the industrial area so that truck traffic need not go through Kailua Town.

The Planning Commission, however, adopted a master plan which provided for three ingress and egress points instead of four. The plan included (1) the present Wanaao Road to Kailua Road; (2) a proposed road to Kailua High School with a 60-foot R.O.W. to connect to Kailua Road via the existing 60-foot Ulumanu Drive in Pohakupu Tract; and (3) the

extension of Keolu Drive to the realigned Kalaniana'ole Highway. The proposed Hamakua Drive which would provide for a 60- or 56-foot R.O.W. and a fourth connection was not adopted due to the uncertainty of the alignment.

In 1963, another new secondary connection was proposed by the developers of Enchanted Lake that would improve a portion of Awakea Road (between Wanaao Road and the abandoned quarry) to a 44-foot R.O.W. This connection would be extended to the present Ka Awakea Road (56-R.O.W.) and the new bridge across Kawainui Stream. The plan at that time, provided for a future connection of Ka Awakea Road through the former Campos Dairy site (presently Kailua Gardens) to Mahani Street, when the dairy's operation ceased. Because of development rights conflict, the extension of Ka Awakea across what is now Kailua Gardens and the Holiday Shopping complex was not constructed when the dairy was relocated to Waimanalo. Hence, when Enchanted Lake Unit 5 was constructed, Ka Awakea Road, as well as Awakea Road and Auwina Street, were terminated in culs-de sac. This apparently resulted in the present awkward curve where Ka Awakea Road meets Awakea Road at the present intersection. Needless to say, if the proposed paralleled Ka Awakea connection to Mahani

Street was constructed, the present traffic problems on Kailua Road could have been materially ameliorated since it would channel some of the residents from Keolu-Enchanted Lake directly into the Kailua shopping center.

In the late 1950s, the only access to Keolu Hills and the Kailua Heights Tract was by way of Kailua Road, Wanaao Road and Keolu Drive. Wanaao Road at that time extended from Kailua Road to just beyond Auwinala Road. From this point, the two laned Keolu Drive began and extended over Kawainui Stream via a small wooden bridge and across Kaelepulu marsh in a southerly direction to what is now Kupau Street, a distance of approximately 3,500 feet. During heavy rainstorm, Keolu Drive was at times impassable at the bridge and other low spots on the marsh road. It was not unusual for young students to be stranded at schools because of rainstorm since there was no way to return home.

Conditions improved somewhat when the original Keolu Drive was replaced by a fully improved 60-foot wide Wanaao Road and the 80-foot wide portion of Keolu Drive loop to Akumu Street. By 1963, 2,000 families were living in Keolu-Enchanted Lake and the traffic congestion was becoming acute since

the population was being increased at the monthly rate of forty families. Although the additional access route by way of Ka Awakea Road was completed, all traffic was still channeled into Kailua Road. As a result, the Enchanted Lake Community Association went on record and requested that action be taken (1) to implement the proposed extension of Keolu Drive to the proposed re-aligned Kalaniana'ole Highway; (2) widen Kailua Road and Wanaao Road to four lanes from the Wanaao-Awakea intersection to Hahaione Street; and (3) change the public school morning hours from 8 a.m. to 8:30 a.m.

As conditions grew worse, the Federal Housing Administration (FHA) decided not to approve any further FHA home mortgages until they were assured of the completion of the Keolu Drive extension to Kalaniana'ole Highway. The difficulties with implementing the Keolu-Kalaniana'ole extension were numerous and included conflicts between developers over Bishop Estate and Kaneohe Ranch lands, agricultural use designation of some portions of the proposed alignment by the State Land Use Commission, and delays by the State in implementing the construction of the four laned limited access Kalaniana'ole Highway from Kailua Road (Castle Hospital) to Waimanalo. In January 1964, bids were

opened for the construction of a four laned highway from the Waimanalo-Kailua junction to the City's Corporation Yard. Part of the contract included grading from the Corporation Yard to the proposed intersection with Keolu Drive. A second contract was awarded at the later part of 1964 to provide for a two laned highway from the Corporation Yard to "Saddle City" in Waimanalo. As sufficient funds became available, two additional lanes were constructed by the State from the Corporation Yard to Saddle City.

Concurrently, a temporary two laned paved road was constructed from the vicinity of Keolu elementary school to the intersection of the State highway by the developers of the Enchanted Lake subdivision. In 1969, an improvement district project was started beginning from Akumu Street to Keolu elementary school to provide for an 80- and 60-foot wide road with a 60- and 40-foot pavement. Following that, the final leg of the Keolu extension to Kalaniana'ole Highway was completed in 1970 with a 60-foot road from Keolu School to Akaakaawa Street and an 80-foot road to the State Kalaniana'ole Highway. Delays in completing the final leg of the Keolu extension were caused by the lack of sanitary sewers from Kaopu Tract on Kaneohe Ranch lands on the Olomana side of Kaelepulu Pond. With the completion of the Kaelepulu

trunk sewer in January 1971, these lands became developable.

Efforts to improve Kailua Road from Hahani Street to Wanaao Road have not been successful. Two prior attempts were initiated in 1963 and 1967 to widen and improve the existing 40-foot wide roadway to its General Planned width of 80 feet. The primary controversy over the proposed 80-foot R.O.W. was the removal of the ironwood trees along the existing makai R.O.W. and the method of assessment on the benefited property owners. The alternative plans which were advocated by some local groups and individuals at that time would have shifted the alignment on the makai side of the road and established a medial strip where the existing ironwood trees could be preserved. Under this alternative, the existing mauka R.O.W. boundary would remain fixed and the acquisition of a 40-foot wide strip would take place along the makai side. This alternative would result in awkward curves at the intersections at Hahani Street and Wanaao Road and could have also required the relocation of about 10 families.

Kailua High School was constructed in 1959 after the Pohakupu subdivision was completed. Prior to September 1962, the high school site was the location

of the Kailua Intermediate School, which is now located on Kainalu Drive.

Prior to the construction of the Keolu Drive connection to Kalaniana'ole Highway in 1965, massive traffic congestions occurred daily during the peak traffic morning hour at the intersection of Kailua Road and Ulumanu Drive. Traffic used to be backed up on the Honolulu bound lanes all the way into Kailua Town. The traffic congestion was due to the inadequate capacity of Ulumanu Drive and the lack of adequate storage capacity of the left turn lane on Kailua Road. Traffic volume counts taken at that time indicated that the capacity of the two-lane Ulumanu Drive was less than 50 percent of what it should be and four lanes were needed. Apparently, traffic generated by the school was not taken into account when the subdivision was approved.

Several recommendations were made to alleviate the adverse traffic conditions on Kailua Road and Ulumanu Drive. These recommendations were:

1. Widen the pavement on Ulumanu Street from 20 feet to 40 feet to provide for four traveling lanes to handle peak traffic hour within the existing 60-foot R.O.W. Sidewalks and curbs were included as part of the improvements for pedestrian use and safety.

2. Extend the length of the left turn lane on Kailua Road further to the end of the strip on the Honolulu bound side to provide for greater storage capacity and segregate the Honolulu bound through traffic from the school bound traffic.
3. Extend the length of the accelerating lane on Kailua Road on the makai side of Ulumanu Road to about 200 feet to facilitate traffic movement from the school to Kailua Town.
4. Control traffic at the intersection by a police officer during peak traffic period in lieu of signalization.
5. Provide another access to the school other than those shown on the General Plan.

The Pohakupu Community Association was strongly opposed to the widening of the pavement width of Ulumanu Drive to 40 feet (4 traffic lanes) and the use of their subdivision road as the main and only access to the high school. The Association suggested that the City explore the possibility of a second access from Kailua Road mauka of a small stream on the makai side (Kailua side) of Pohakupu subdivision. This potential second access road to the high school would run parallel to the existing Uluopihi Loop; however, its approval was

contingent on the closure of one of the existing accesses to Kukanono Tract by the State. The proposed second access would have cost \$150,000 (1962 dollars), exclusive of land costs compared to \$25,000 for the widening and improvement of Ulumanu Drive to a standard 40-foot pavement.

Residents of both Uluopihi Loop and Kukanono Tract were opposed to the proposed second access citing costs, inconveniences, and non-conformance to the General Plan. Since the residents of Pohakupu Tract were opposed to the widening of Ulumanu Drive and the Corporation Counsel ruled that the proposed road widening project could not proceed without going through the improvement district proceedings, the City Council took no action and no improvements were constructed.

After the completion of Kalaniana'ole Highway from Castle Hospital to Waimanalo and the extension of Keolu Drive to the highway, traffic congestion on Kailua Road at the Ulumanu Drive intersection has been greatly alleviated; however, the 80-foot extension from Keolu Drive to the high school is still considered a potential project since it has not been deleted from the General Plan. Part of the extension has already been built from the

Keolu Drive terminus as part of Akiohala Street to the full 80-foot General Planned width.

On December 10, 1975, the City Public Works Department tried unsuccessfully to transfer the responsibility of the planning and construction of the Ulumanu Drive extension to Keolu Drive to the State Department of Accounting and General Services (DAGS), inasmuch as Kailua High School is a State facility. By letter dated May 3, 1976, DAGS informed Public Works that plans for a two laned road to Kailua High School were completed and construction was pending due to R.O.W. problems. The proposed second access to the school would terminate in a cul-de-sac at the boundary since it meets the requirements of the State Department of Education. It appears that the extension through the school ground will not be implemented at all since school officials believed that such a road would disrupt school operation.

B. Objectives

The objectives of the proposed actions are to review and evaluate the existing and proposed transportation system's requirements for the Keolu-Enchanted Lake section of Kailua, Oahu. The present transportation system has evolved from the General Plan and Detailed

Land Use Map adopted in 1964 and the amended Development Plan for the affected area. At the present time, only one of the four proposed access roads serving Keolu-Enchanted Lake is fully improved and that is the Keolu Drive connection to Kalaniana'ole Highway. The other existing access, the Wanaao-Kailua Roads connection, is fully improved except for the portions between Mahani Street and Auwina Street. Two of the proposed access roads, the Hamakua Drive and Ulumanu Drive-Akiohala Street terminate in "dead-ends," their connecting links still undeveloped.

This is the appropriate time to re-examine the needs for the four access roads into Keolu-Enchanted Lake from the standpoint of congestion, unsafe conditions and environmental impact prior to adoption of a new development plan for Kailua which may occur in 2-3 years.

C. Technical Characteristics

The technical characteristics given here for each of the proposed actions will be based upon the recommended alternative for the individual projects. This is particularly true for the access roads serving Keolu-Enchanted Lake. Hence, some of the discussion here and elsewhere may be in qualitative terms.

Two of the three actions are improvements to existing streets (roads) which are inadequate according to present standards. The other one is proposed over undeveloped lands. Street standards are established for R.O.W. widths, pavement, and sidewalk as part of the "Subdivision Rules and Regulations" administered by the City's Department of Land Utilization. Minimum and maximum road grades are also established under the subdivision rules. Streets are classified into four categories: major, secondary, minor and dead end streets. The R.O.W. widths for major and secondary streets vary from 70 to 108 feet, and 56 to 60 feet, respectively. The pavement widths vary from 56 feet to 72 feet and 40 to 44 feet in the same order. Sidewalk widths are 7, 8 and 10 for major and secondary streets. A typical subdivision street would have a 44-foot R.O.W. width, two 8-foot sidewalk areas and a pavement width of 28 feet. A two feet wide concrete gutter on each side of the street is part of the pavement width. Curbs and gutters serve as channels for storm runoff into catchbasins.

Other standard street appurtenances include fire hydrants, street lighting, concrete driveways, and storm drains. Utilities can include water, sewer, gas, electric, and communication (video) lines.

Major and secondary streets are designated on the General Plan (GP), Development Plan (DP) and/or the Detailed Land Use Map (DLUM).

The 1964 GP as shown in Figure IV-2 delineates Kailua's major traffic network to be Kailua Road, Kalaniana'ole Highway, Kuulei Road, Oneawa Street, Kalaheo Avenue, Mokapu Boulevard, Keolu Drive Loop, Hamakua Drive and Ulumanu Drive. The DP/DLUM (1971/1964) for Kailua established the R.O.W. widths for major and secondary streets. The proposed and existing R.O.W.s for the affected area are shown in Figure II-5. Within the Kailua Business Area, Kailua Road, Kuulei Road and Oneawa Street are fully improved streets built in accordance with the DP/DLUM. The proposed actions seek to implement the GP/DP/DLUM requirements based on actual and proposed traffic capacity and demands.

1. Hamakua Drive Improvements

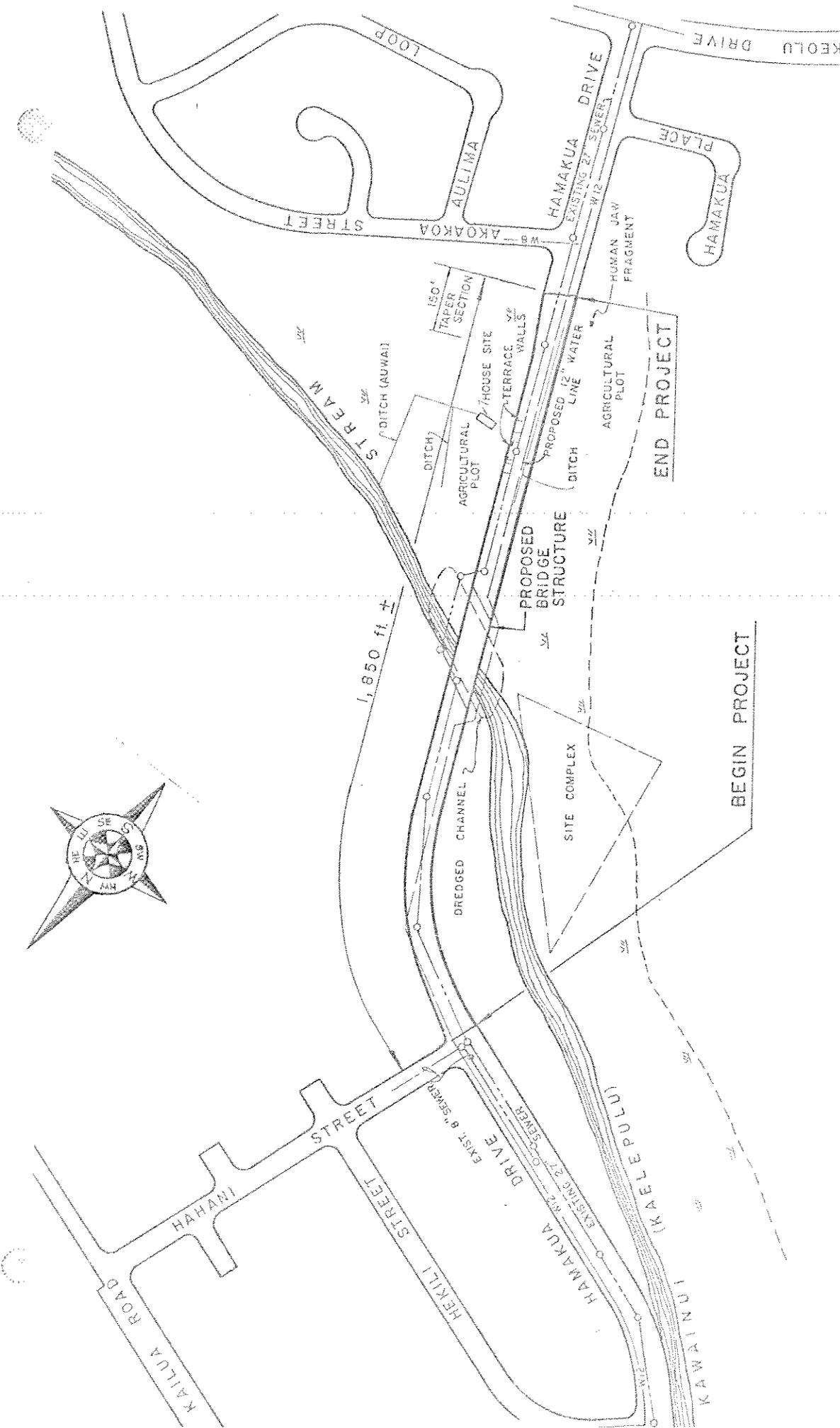
The proposed improvements of Hamakua Drive from Hahani Street to Akoakoa Street will include four 11-foot lanes, two 8-foot sidewalk or shoulder areas, two 5-foot bike lanes and a 210 feet long reinforced concrete bridge within a 70-foot R.O.W.

for a distance of approximately 1,850 feet. At both connections to the existing sections of the 80-foot roadway, there will be a tapered section measuring 10 feet wide by approximately 150 feet long. Details of the bridge structure are not available. The elevation of the bridge soffit will be set at 7.5 feet MSL. Work will also include the construction of a 12-inch water main from Hahani Street to Akoakoa Street, adjustment to the existing 27-inch trunk sewer, and minor dredging of Kawainui Stream to its master planned R.O.W. of 107 feet and depth (-6.0 feet) around the bridge abutments. Substantial fill material will have to be imported principally for the Enchanted Lake side of the proposed roadway extension. Piles will be driven to support the bridge structure. The number, type and length of piles are not known at this time. Sidewalks and railing (walls) will be part of the bridge superstructure. Utility lines may be constructed underground. Initially, curbs, gutters and concrete sidewalks may not be constructed since it is intended that this portion of Hamakua Drive become a limited access roadway. No private driveways will be permitted access to this road corridor.

2. Kailua Road Improvements .

The proposed improvements of Kailua Road between Hahani Street to Awakea Road on Wanaao Road will include two 12-foot lanes, two 8-foot sidewalk areas, two on-street parking strips, curbs, gutters, street lighting, and driveways within a 56-foot R.O.W. Trenches will be excavated for approximately





DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU

**IMPROVEMENT OF HAMAKUA DRIVE
 FROM HAHANI STREET TO AKOAKOA STREET
 AND RELATED IMPROVEMENTS OF HAMAKUA DRIVE
 AND RELATED STREETS SERVING THE
 KEOLU-ENCHANTED LAKE AREA**

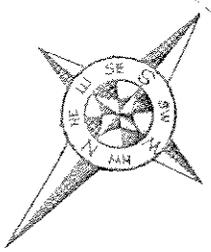
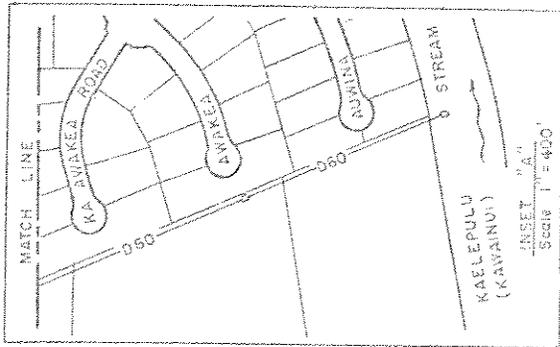
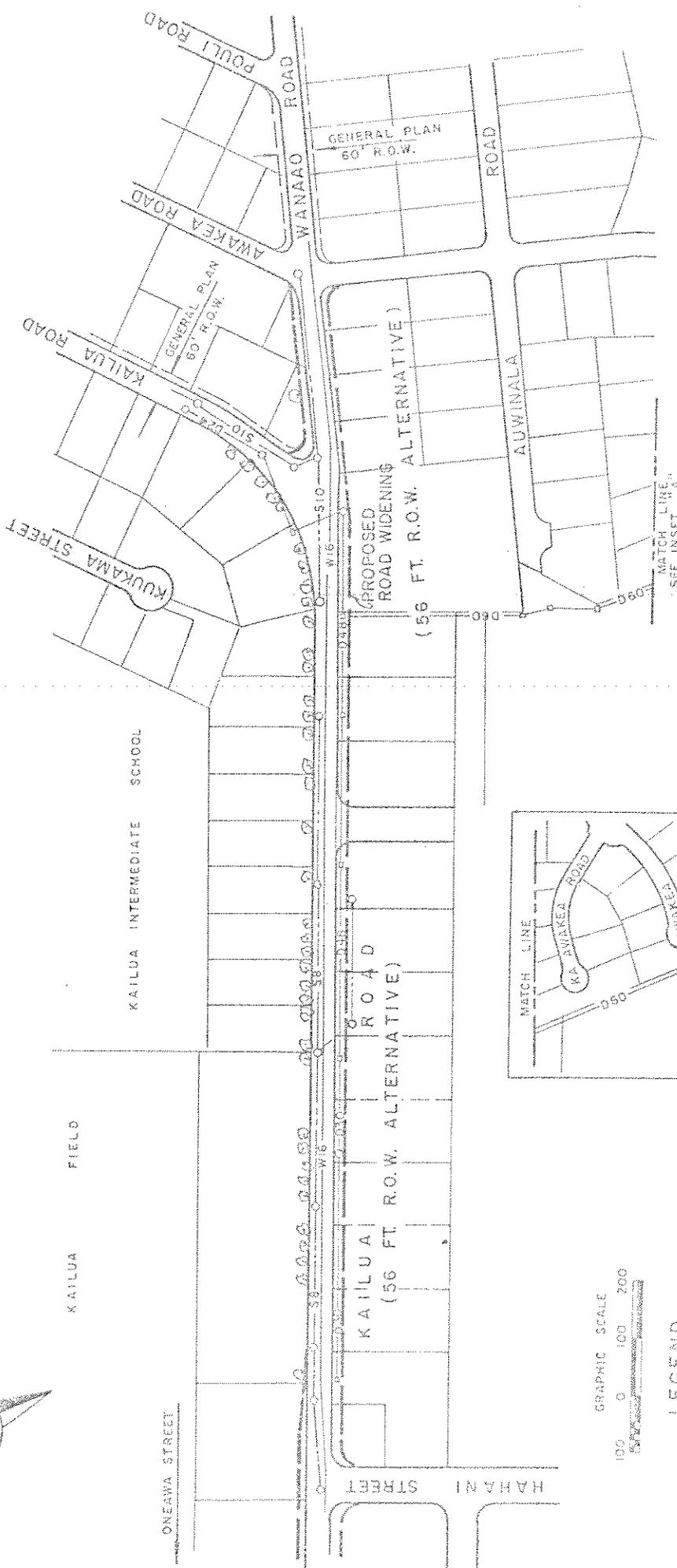
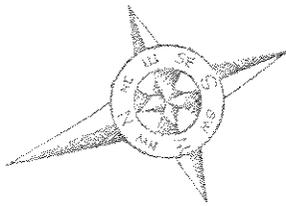


FIGURE II-1





GRAPHIC SCALE
 0 100 200
 Feet

LEGEND

- ⊙ TREE
- S— SEWER LINE
- D— STORM DRAIN
- W— WATER LINE
- — — PROPOSED ROAD WIDENING

DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU

KAILUA ROAD IMPROVEMENT DISTRICT
 FROM HAHANI STREET TO WANAAO STREET INTERSECTION
PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA



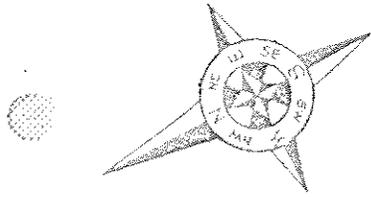
1,350 linear feet of 8-inch sewer and 2,270 linear feet of storm drains, ranging in pipe sizes from 24-inch to 48-inch within the R.O.W. Another 1,480 linear feet of 60-inch drain will be laid within a 15-foot easement from Kailua Road to Kawainui Stream. The invert of the proposed outlet will be at elevation (-)4.55 feet. Excavation of the stream around the outlet will be required.

The Hahani Street intersection will include a left turn lane for Kailua bound traffic desiring to turn onto Hahani Street. A 20-foot wide tapered section approximately 150 feet long will connect the 80-foot wide R.O.W. to the 56-foot R.O.W. on the makai side. On-street parking will be permitted except near the intersection of Hahani Street and the Wanaao Road junction. Two traveling lanes on the mauka side of the junction will permit the Enchanted Lake-bound traffic to proceed without stopping on the red-light cycle. Conversely, it will permit Kailua Beach-bound traffic on Wanaao to turn right and eliminate the prolong queuing that presently occurs at the intersection.

3. Wanaao Road Improvements

The proposed improvements to Wanaao Road between Awakea Road to Auwina Street will include two 12-foot lanes, two 8-foot sidewalk areas, two on-street parking strips, curbs, gutters, street lighting and driveways within a 56-foot R.O.W. The road curve at Kakahiaka Street will be improved with a longer curve radius. A storm drain will be laid within the entire





12-II

LEGEND

- (thick dashed line) — PROPOSED ROAD WIDENING
- (line with S8) — SEWER LINE
- (line with FM24) — FORCE MAIN
- (line with W-12) — WATER LINE



DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU

WANAAO ROAD IMPROVEMENT DISTRICT
AWAKEA ROAD TO WANAAO ROAD BRIDGE

PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA

FIGURE II-3

R.O.W. ranging in pipe sizes from 24 to 54 inches. Two outlets through 15-foot easements into the main channel of Kaelepulu Stream are proposed. The first is a 54-inch outlet from Kakahiaka Street and the other is a 48-inch outlet from Wanaao Road. Excavation on the main bank will be required for the outlet structures.

4. Other Improvements

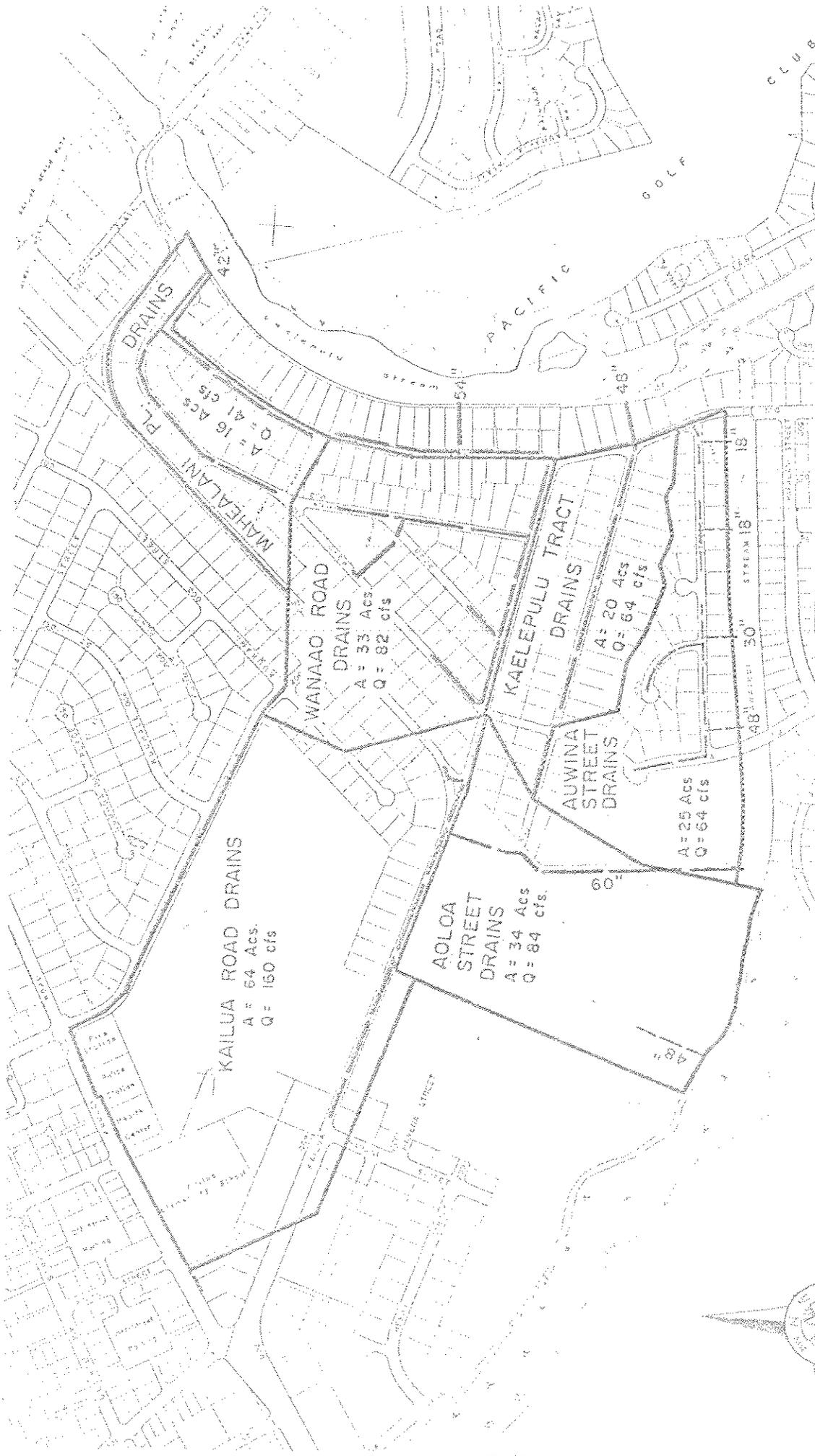
In this category, other improvements will include the Kailua Bikeway System, Awakea Road improvements between Ka Awakea Road to Wanaao Road, widening of the unimproved or partially improved sections of Kawainui Stream downstream of the Kailua Road bridge, Mahealani Place Drains, Kaelepulu Tract Drains, and the widening of Hamakua Drive, Kailua Road to Hekili Street.

As stated elsewhere, the Ulumanu Drive extension has been modified by the State and will consist of a two-lane temporary extension of Akiohala Street that will terminate in a cul-de-sac at the Kailua High School boundary. The alignment of the State road will deviate from the DLUM's alignment to eliminate a reverse horizontal curve and to shorten the walking distance to the gymnasium. There are no plans to implement the general planned roadway.

The proposed improvement of Awakea Road will consist of retaining the present 40-foot R.O.W. and increasing the pavement width from 20 to 28 feet for a distance of approximately

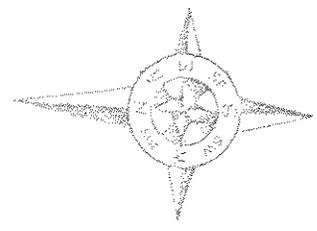
EXISTING & PROPOSED DRAINS

DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

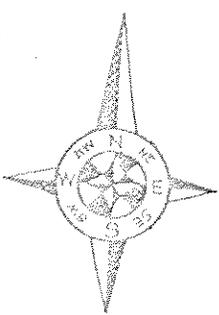


LEGEND

- EXISTING DRAINS
- PROPOSED DRAINS
- BOUNDARY LINE



GRAPHIC SCALE
 400 0 400 800
Vertical scale bar with markings at 400, 0, 400, and 800 units.



HAWAII YOUTH
CORRECTION FACILITY



LEGEND

- EXISTING HIGHWAY / STREET
- - - PROPOSED NEW STREET
- - - - PROPOSED STREET WIDENING
- ⊙ SIGNALIZED INTERSECTION
- 120' GENERAL PLAN R/W
- 120' EXISTING R/W

DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU
EXISTING & PROPOSED STREET RIGHT-OF-WAY
KEOLU - ENCHANTED LAKE
PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA

FIGURE II-5





HAWAII YOUTH
CORRECTION FACILITY

LEGEND

- EXISTING HIGHWAY / STREET
- - - - - PROPOSED NEW STREET
- - - - - PROPOSED STREET WIDENING
- ⊕ SIGNALIZED INTERSECTION
- ⊕ 120' GENERAL PLAN R/W
- ⊕ 120' RECOMMENDED R/W



DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

RECOMMENDED STREET RIGHT-OF-WAY
KEOLU - ENCHANTED LAKE

PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA

FIGURE II-6

400 feet. The southeast road curve at the 4-way intersection may also be improved to facilitate turning movements. Completion of this short segment will provide for a fully improved facility from Wanaao Road to Keolu Drive loop via Awakea Road, Ka Awakea Road and Papalani Street.

5. Kailua Bikeway System

The established bikeway routes in Kailua are located on Mokulua-Aalapapa (Lanikai Loop), Kainui-Kainalu Drive, and portions of Kalaheo Avenue, Maluniu Avenue, Kailua Road, Wanaao Road, Keolu Drive, Papalani-Ka Awakea-Awakea-Aumoe Road, and Ulupii Street. The Lanikai bike loop is one of the first intra-community bikeway system developed by the City and County. Another significant existing facility is along Kainui-Kainalu in Coconut Grove. Total length of existing bike lanes in Kailua is about 5 miles.

The existing bike routes in Keolu-Enchanted consist of Keolu Drive Loop from Akamai Street to Papalani Street. Bike access routes serving Keolu-Enchanted Lake are by way of Wanaao Road, and Papalani-Ka Awakea-Awakea. The destinations of most of the bike trips are believed to be Keolu and Enchanted Lake Schools and Parks, Enchanted Lake Shopping Center and Kailua Beach Park. The average daily bike traffic is estimated to be about 20 trips along the two access roads.

The proposed Keolu-Enchanted Lake bikeway system includes

the entire Keolu Drive loop with accesses to Kalaniana'ole Highway, Kailua Town and Kailua Beach Park as shown in Figure II-7. Main access to the inter-community bike systems (e.g., Waiamanalo, Kaneohe) will be via Keolu Drive and Kalaniana'ole Highway. The most direct bike route to Kailua Beach Park will continue to be through Papalani-Aumoe. The proposed Hamakua Drive will become the most direct access to Kailua Town and Coconut Grove. Provisions, therefore, will be made to include two 5-foot bike lanes on Hamakua Drive.

In addition to the improvements of the Hamakua Drive connection, the entire Hamakua Drive and Keolu Drive will be designed as a bike route with appropriate signs, and/or markings. Bike lanes will be provided on the existing 80-foot wide portions of Hamakua Drive and bike paths on the existing sidewalk-shoulder areas of the existing 56-foot portion. The existing pavement on Awakea Road between Auwinala Road and Wanaao Road will be widened from 2 to 4 feet to provide for a 28-foot wide pavement including the two bike paths.

Other bikeway improvements will be along Kuulei Road, South Kalaheo Avenue, Kaneohe Bay Drive, and Kailua Beach Park.



LEGEND

Existing Route (lane)

Proposed Route (lane)

DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU

PORTIONS OF KANEOHE-KAILUA BIKEWAY SYSTEM
 (SOURCE: BIKEPLAN HAWAII)

PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA
 KAILUA, KOOLAUPOKO, OAHU

FIGURE II-7



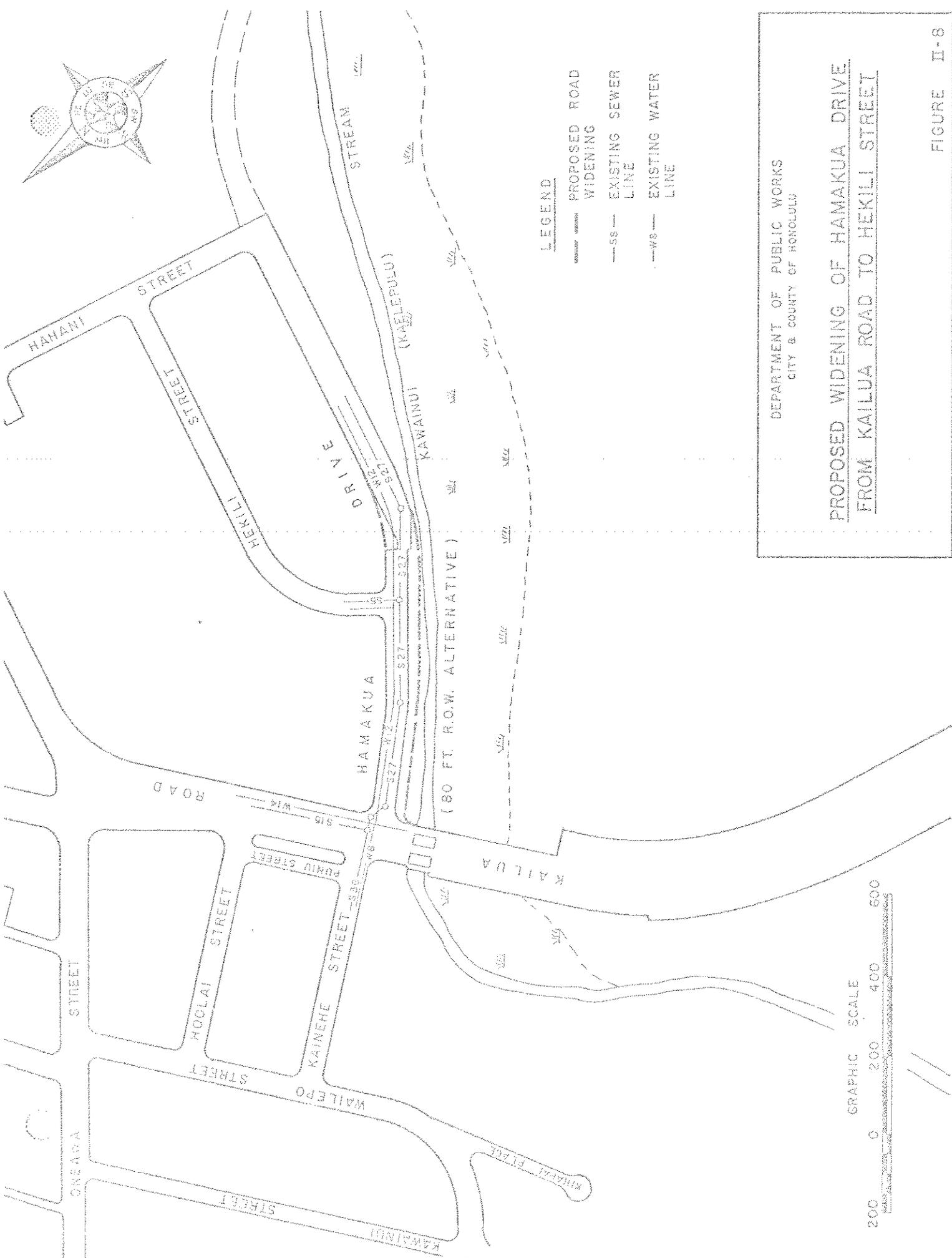
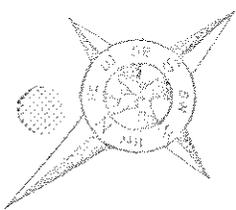
6. Proposed Widening of Hamakua Drive

The proposed improvements of the existing Hamakua Drive from Kailua Road to Hekila Street was kept separate from the Hamakua connection in order to avoid confusion between the two projects. The proposed improvements will include four 11-foot lanes, 10-foot left turn lane, and two 5-foot bike lanes within an 80-foot R.O.W. for a distance of approximately 680 feet. The existing road has a 40-foot pavement within a 56-foot R.O.W. Concrete sidewalks, curbs and gutters are part of the existing improvements along the makai R.O.W. The sidewalk area on the mauka R.O.W., along-side Kawainui Stream, is grassed but has curbs and gutters.

Under the proposed improvement, the pavement width will be widened by 24 feet to 64 feet alongside the stream R.O.W. It is not known at this time whether the natural side slopes of the stream have to be replaced by concrete walls in order to provide fast land for the additional 24 feet.

A left turn lane on Hamakua is considered essential since a study of the Kailua Road intersection indicated that 84 percent of the peak A.M. traffic and 53 percent of the peak P.M. traffic make left turn movements onto Kailua Road.





LEGEND

- PROPOSED ROAD WIDENING
- SS— EXISTING SEWER LINE
- WS— EXISTING WATER LINE

DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

**PROPOSED WIDENING OF HAMAKUA DRIVE
FROM KAILUA ROAD TO HEKILI STREET**



FIGURE II-8

7. Traffic Assignment

In 1972, the traffic engineering firm of Alan M. Voorhees & Associates submitted a report to the City Department of Transportation Services entitled, "Kaneohe-Kailua, origin and Destination, Traffic Study." The purpose of the study was to update the State Department of Transportation Highway's 1960 origin and destination study of Windward Oahu.

Traffic assignments were determined after gathering data from home interviews at Kailua (Census Tracts 109, 110, 111, and 112), and a roadside survey. Data obtained from the home interviews included employment characteristics, and number of trips generated per persons and per dwelling unit. The number of tourist trips was the principle data obtained from the roadside survey. The number of traffic trips generated from each dwelling unit was 7.1 per day for Kailua compared with 8.4 for all of Windward Oahu (CT 101 to 113).

Traffic assignments were made for the Years 1971 and 1995. The total number of auto trips generated in 1971 by Census Tract 111 (Keolu-Enchanted Lake area including Olomana Tract) was 21,285 ADT (average daily traffic). The number of auto trips within the census tract area was 15,741 ADT and 10,445 ADT for the Years 1971 and 1960, respectively.

Traffic demand assignments were made under three major assumptions or conditions. They included: (A) Without

Saddle Road, TH-3, Hamakua Drive connection, and Ulumanu Drive connection; (B) Without TH-3 and Hamakua Drive connection; and (C) With TH-3 and the Dike Road. The elimination of the Dike Road and possibly TH-3, and also the recent improvements of Oneawa Street without widening could have an overall adverse effect on traffic capacity in Kailua and the rest of the Windward communities.

Traffic demands under the 1972 study were refined in 1977 by traffic engineers from the Department of Transportation Services. These updated data will be used in determining the traffic demands for the access roads serving the Keolu-Enchanted Lake area. The three 1972 conditions/assumptions were reduced to two conditions since the Ulumanu access road was not considered essential. The conditions/assumptions are: (A) Without Hamakua Drive and (B) With Hamakua Drive.

Traffic meter counts taken in 1975-76 and supplemented by additional counts in early 1977 on Keolu Drive-Kalaniana'ole, Hamakua-Kailua Road, and Kailua Road-A'oloa Street indicated that the 1972 traffic demands were grossly underestimated.

Under the 1972 traffic network system without the Hamakua and Ulumanu Drives Connections (Condition A), the traffic demand projections for the year 1995 were: 19,360 ADT for Keolu-Kalaniana'ole, an increase of 7,641 ADT; 5,899 ADT for Wanao Road, a decrease of 1,052 ADT; and 7,783 ADT for

Kailua Road, a decrease of 659 ADT. The 1976-77 traffic counts indicated that the ADT for Keolu-Kalaniana'ole, Wanaao Road and Kailua Road were 14,782 ADT, 11,134 ADT, and 18,429 ADT, respectively.

The 1976-77 traffic counts indicated that the Voorhees' study for the year 1995 were already being exceeded in 1977 for Keolu-Enchanted Lake. To get the projected 1995 ADT for the affected access road, potential number of dwelling units from new developments were calculated by DTS based on existing zoning. The number of ADT from the potential new developments were distributed and added, as the case may be, to the present ADT on the existing and proposed access roads.

The DTS projected traffic demands were developed for the no action alternative which would limit the number of access roads into Keolu-Enchanted Lake to two, Keolu-Kalaniana'ole and Kailua-Wanaao Roads (Condition A). Under this alternative the 1995 ADT for Kailua Road will be 28,400 with a peak hour traffic of 2,400 vehicular trips. The 1995 ADT for both Keolu-Kalaniana'ole and Wanaao Road would increase the former to 17,500 trips and the latter to 13,400 trips. Their peak hour demands will be 1,420 and 1,200 trips, respectively. Under this alternative, Kailua Road would need six lanes (3 in each way within a R.O.W. of 80 feet) and Wanaao would retain its two lanes (1 each way within a R.O.W. of 56 feet).

Condition A - Without Hamakua and Ulumanu Drive Connection

<u>Affected Street</u>	<u>Traffic Demand (ADT)</u>			<u>R.O.W. Width (ft.)</u>		
	<u>1971</u>	<u>1975-77</u>	<u>1995</u>	<u>Exist.</u>	<u>G.P.</u>	<u>Recom.</u>
Keolu-Kalaniana'ole	10,719	14,800	17,500	80	80	-
Wanao Road	6,951	11,100	13,400	40	60	56
Kailua Road	8,442	18,400	28,400	40	80	80

Condition B - With Three GP Access Roads*

<u>Affected Street</u>	<u>Traffic Demand (ADT)</u>			<u>R.O.W. Width (ft.)</u>		
	<u>1971</u>	<u>1977</u>	<u>1995</u>	<u>Exist.</u>	<u>G.P.</u>	<u>Recom.</u>
Keolu-Kalaniana'ole	7,918	12,000	13,900	80	80	-
Wanao Road	4,061	8,900	10,000	40	60	56
Kailua Road	5,555	13,500	17,600	40	80	56
Hamakua Connection	4,905	8,500	14,800	0	80	70

*The Ulumanu Drive connection, a general planned access road, will be recommended to be deleted from the proposed Development Plan for Kailua. The 1971 traffic demands shown, are on the basis that Ulumanu connection was in operation.

No further improvements would be required at Keolu-Kalaniana'ole which has an 80-foot R.O.W. under this and the recommended alternative.

Under the recommended alternative, with three access roads serving Keolu-Enchanted Lake, the 1995 ADT/peak hour traffic on Keolu-Kalaniana'ole, Wanaao Road and Kailua Road would be reduced to 13,900/1150, 10,000/890 and 17,600/1496, respectively. The 1995 ADT/peak hour traffic for Hamakua Drive will be 14,800/1400. The peak hour traffic would require four lanes (2 in each direction) within a 70-ft. R.O.W. between Hahani Street and Akoakoa Street, and five lanes between the existing Hekili Street and Kailua Road segment where a left-turn lane and two 5-foot bike lanes will be provided. The Hekili-Kailua Road segment will be widened from 56 to 80 feet.

Under the alternative recommended by DTS, the GP access road from Keolu Drive loop to Kailua Road via Kailua High School will not be implemented. The recommended plan for Kailua and Wanaao Roads would provide for two lanes with on-street parking within a 40-foot wide pavement. In the event more traffic is generated than projected during the peak hour, the parking ban will be instituted on these roads, so as to provide one additional lane in the peak direction.

D. Social-Economic Characteristics

Keolu-Enchanted Lake is part of Census Tract (CT) 111. Beginning from Kaiwa ridge in the clock-wise direction, the Census Tract boundary follows the boundary of Bellows Field, Kalaniana'ole Highway, Kailua Road, Kuulei Road, Kainalu Drive, and the Mid-Pacific Country Club boundary. The State Department of Planning and Economic Development (1976) reported that the 1975 population of Census Tract 111 was 15,324, an increase of about 2,000 over 1970. The number of housing units was 4,036 for 1975 compared to 3,281 for 1970. The number of employment by place of work was 2,163 for 1970. Median family income (1969) was about \$14,500. By comparison, the annual median family income for the State is \$11,650, and the national median is \$9,857.

Other social-economic characteristics are available for the Koolaupoko judicial district only. Such data has been documented by the State Department of Planning and Economic Development from the 1970 Census.

<u>Regional Community Profile</u> (Source: DPED)	<u>Values in Percent or as Noted</u>
Ethnic groups - Caucasian	53
Japanese	19
Hawaiian	12
Chinese	6
Origin (foreign/local born)	4/56.2
Education (8th/college)	14.5/17.1
Median family income	\$13,536
Housing lacking plumbing	1.5

<u>Regional Community Profile</u>	<u>Values in Percent or as Noted</u>
Income below poverty level	5.5
Housing owner occupied	65.6
Housing median value	\$39,000
Housing median monthly rent	\$162

The data indicate that the annual median family income and median value of housing for the Koolaupoko district are the highest on Oahu.

There are no major industrial and agricultural activities in Kailua proper. The Hawaiian Construction and Drain Company (HC&D) operates a quarry mauka of Kawainui marsh which is vital to the construction industry and to the economy of Oahu. Access to the quarry site is by way of Kapaa Quarry Road, and Kalaniana'ole Highway and Mokapu Boulevard.

The Kaneohe Marine Corps Air Station (KMCAS) is one of largest employers on Windward Oahu. Approximately 8,600 military and civilian personnel were employed on the base in 1974, including about 1050 civil service and other civilian employees (KMCAS, 1974).

Agricultural activities in Kailua are limited to cattle grazing and ranching in Kawainui marsh, Gaunswili Valley, and around the base and slopes of Puu O Ehu. Cattle feed is harvested on a regular basis in Kawainui marsh and

Maunawili Valley. Another agricultural activity is a small banana farm on the mauka slope of Olomana Tract. Two riding stables are located in Maunawili and Kawainui.

Commercial activities are concentrated in the main shopping center in downtown Kailua and two satellite shopping centers at Aikahi and Enchanted Lake. A proposed fourth shopping center along the southwest corner of Kawainui marsh has been abandoned at this time. The Enchanted Lake shopping center on Keolu Drive Loop has an area of about seven acres and includes a supermarket, two financial institutions, two restaurants, a drugstore, three service stations, three fast-food outlets and other sundry retail stores. A private tennis facility is located on an adjacent lot.

The State Department of Education maintains three elementary schools (Kindergarten to Grade 6) within the Keolu-Enchanted Lake area. They include Keolu, Enchanted Lake and Kaelepulu elementary schools. Keolu School was built first, primarily for the Keolu Hills and Kailua Heights Tracts, followed by Enchanted Lake School and Kaelepulu School for the Kaopa Tract. All schools are located on Keolu Drive Loop. The last two years school statistics are as follows:

<u>School</u>	<u>1974-75</u>		<u>1975-76</u>	
	<u>Staff</u>	<u>Pupils</u>	<u>Staff</u>	<u>Pupils</u>
Keolu	35	711	31	656
Enchanted Lake	35	709	35	969
Kaelepulu	9	204	9	211

Kaelepulu School is in its second year of operation, and this is reflected in the enrollment. Also there are many vacant lots in Kaopa Tract, a recently opened housing tract. The enrollment for Keolu which served the older section of the area will probably continue to decrease in the future.

Intermediate grade students from Keolu-Enchanted Lake attend Kailua Intermediate on Kainalu Drive which had an enrollment of 1,291 in 1975-76 (1,422 in 1974-75) and an instructional staff of 56. After completing their intermediate instructions, these same students will attend Kailua High School on Ulumānu Drive in Pohakapu Tract which has an enrollment of 2,250 students. Kalaheo is another high school at Kalaheo Hillside off Mokapu Boulevard which once served as an intermediate school. The enrollment is 1,628 students. The total number of public schools in Kailua is 12, including 2 high, 1 intermediate, and 9 elementary schools. In addition, there are 7 private schools offering instruction from Kindergarten to Grade 8. St. John Vianney (K-8), a Catholic school, is located on Keolu Drive loop and has a student enrollment of 298 (1975-76).

One of the public schools which may be affected by the proposed actions is Kailua Intermediate on Kainalu Drive. The intermediate school's mauka boundary is approximately 185 feet from the existing R.O.W. of Kailua Road between

Hahani to Wanaao. If the road is widened to its General Planned width of 80 feet, this distance will be reduced to 165 feet. The nearest classroom is located approximately 200 feet away from the school boundary. However, since the recommended plan is to retain the present makai boundary, there should be no adverse effect on the school operations. Actually, if the recommended improvements to Hamakua Drive and Kailua Road are completed, there should be a beneficial effect of the school with lower traffic volume and noise level and less air pollutants. The proposed extension of Ulumanu Drive to Keolu Drive as shown on the General Plan would bisect the high school campus in two, separating the athletic field from the rest of the school facilities; however, this project will not be implemented.

The social characteristics of the proposed actions upon the community cannot be well defined. The road projects for instance cannot be credited with increasing the cohesiveness of the community since there are sufficient access roads and traffic capacity during non-peak A.M. and P.M. hours. A tangible benefit will be the increase of pedestrian safety if concrete sidewalks were constructed as part of the improvements on Kailua and Wanaao Roads.

Widening of Kailua and Wanaao Roads is not expected to result in the relocation of any resident. However, reducing yard and parking areas of abutting properties may be viewed as

unnecessary encroachment by government by the affected residents. This antipathy is not usually assuaged by the knowledge that the benefits received from the proposed improvements will benefit the entire community.

If the improvements to Kailua Road and Wanaao Road were financed through the improvement district statutes, the benefited property owners or lessees will be assessed to pay for part of the improvement costs. The assessment rates will be established by the City Council. Under some situations, the amount of the assessment can be reduced by the reimbursement for the cost of land acquisition if the lands were in fee simple. In the case of leased lands, the cost of land acquisition is paid to the lessor (land owners); however, the lessees are liable for the assessment. This appears to be the situation for the Kailua and Wanaao Roads improvements.

If the Hamakua connection is constructed entirely by State and City funds, the land owner(s) will be reimbursed for the cost of the land acquisition. Assuming the lands abutting the roadway were developed, the developer(s) would receive a benefit since he need not construct these improvements as part of his subdivision costs. The usual procedure is for the developer(s) to provide the land and construct the road facility as part of his subdivision costs.

E. Environmental Characteristics

The road improvement projects will be accompanied by a change in land form. In the road widening projects, the changes will be less pronounced than the Hamakua Drive connection. The latter will be over raw undeveloped lands.

Based on the recommended alternative, the paved area would be increased from 20 feet to 40 feet for the Kailua and Wanaao Roads widening projects. Concrete sidewalks will replace the AC paved sidewalks on Kailua Road and grassed walkway on Wanaao Road. In order to spare the ironwood trees along Kailua Road, a 56-foot R.O.W. will be adopted; however, one (1) tree near the Hahani Street intersection will be destroyed. An 80-foot R.O.W. would have required the destruction of twenty (20) trees or may require the relocation of 10 families if the ironwoods are to be spared. The 60- and 56-foot R.O.W. will essentially provide for the same pavement width (44 feet versus 40 feet). The AC parking lots on the mauka side will be replaced by AC pavement and concrete sidewalk. The paper-bark trees and grassed walkways from Aoloa Street to Awakea Road will be replaced by the roadway. The monkey-pod tree at the Kailua Road-Wanaao Road junction may be relocated. All other shrubs, refuse bins, hollow-tiles and brick walls within the new R.O.W. will be demolished. Owners whose properties are damaged will be compensated by the City.

Along Wanaao Road, most of the existing hedges, hollow-tile concrete walls, fences, tecoma trees, coconut trees, and a banyan tree will be affected. One garage and a tile patio will be altered. Here again, the property owners or lessees will be compensated for damages or replacements of equal value will be arranged. Trees located in the new sidewalk area will be retained whenever possible.

The Hamakua Drive connection would require large amounts of fill to bring the roadway elevations up to grade. Grubbing will clear the existing vegetation prior to filling. Since the area is undeveloped, there will be no relocation. After the improvements are completed, it is anticipated that the surrounding abutting areas will be urbanized unless the area is downzoned. This will be a sharp contrast to the existing conditions.

The bridge structure over Kawainui Stream will probably have a relatively low profile although a minimum boat clearance of 6 feet will be provided. The stream surrounding the bridge abutment will be dredged to its master planned width and depth. This will require the clearing of the existing vegetation on both banks within the affected area. The stream will not be lined. After a short while, vegetation will be re-established on the stream bank.

Water, sewer and drain lines will be placed underground and the only visible appurtenances will be manhole covers, fire hydrants, and catch basins within the R.O.W. Outlet structure for drain lines will be visible on the stream banks. It is not known at this time whether utility wiring will be placed underground on any of the road improvement projects.

F. Funding and Project Schedule

There are three (3) road improvement projects relating to the access to the Keolu-Enchanted Lake area that are listed in the City and County current (1977-1978) Fiscal Year Six-Year Capital Improvements Program (CIP). They are identified as follows: Project No. 722113, Hamakua Drive; Project No. 714089, Kailua Road Improvement District; and Project No. 720132, Wanaao Road Improvement District. To date (September 1977), State funds have been appropriated for two of the three projects.

Monies appropriated by the State Legislature include: the sum of \$500,000 for Hamakua Drive by Acts 218 SLH (Session Laws of Hawaii) 1974, 195 SLH 1975, 226 SLH 1976 and 9 SLH 1977, for land acquisition, plans and construction; and an amount of \$300,000 for Kailua Road by Act 218 SLH 1974 for plans and construction. An appropriation of \$100,000 for Ulumanu Drive by Act 195 SLH 1975 for plans will not be sought. To date (September 1977), a sum of \$100,000 has been released by Governor Ariyoshi for the planning and engineering of Hamakua Drive. Lapsing dates for the various State funds are Act 218/1974, June 30, 1979; Act 195/1975, June 30, 1979; Act 226/1976, June 30, 1980; and Act 9/1977, June 30, 1981.

The City will participate in the funding schemes for Hamakua Drive, Kailua Road and Wanaao Road to the extent as provided by the applicable ordinances and according to the wishes of

the City Council. Cost-benefit ratio are not required for City and County projects. Therefore, the amount and the extent of the City's participation in the cost of any of the proposed actions cannot be determined. There are no City funds earmarked for any of the road and drain projects in the current and the next fiscal years (1976-1979).

Depending on the funding scheme finally adopted, benefited property owner(s) may be assessed for portions of the improvement costs as determined by the City Council. A benefited property owner is defined as the owner or lessee of real property abutting or within an improvement district project boundary which are provided specific benefits. These benefits could include curbs, gutters, sidewalks, driveways, street lighting, sewer laterals and other road appurtenances. Assessment rates are determined by the City Council pursuant to the provisions of the improvement district ordinance, Chapter 24, Revised Ordinances of Honolulu, 1969, as amended.

The preliminary estimated costs (1977 dollars) of the various proposed projects based on their full General Planned width are listed below. The costs include engineering, construction, inspection, land, administration and contingency costs.

Hanakua Drive Improvements	\$3,370,000
Kailua Road Improvements	2,020,000
Wanaao Road Improvements	1,375,000

Costs of land acquisition for the General Planned right-of-ways include \$1,500,000 for Hamakua Drive, \$385,000 for Kailua Road, and \$225,000 for Wanaao Road. Based on the recommended alternatives, the R.O.W.s will be reduced from 80 feet to 70 feet for Hamakua Drive, and 56 feet for Kailua and Wanaao Roads. The reduction of the R.O.W. widths will affect the cost of the improvements and the cost of land acquisitions, and the revised total costs would amount to approximately \$3,006,000, \$1,654,000 and \$1,335,000 in the same order. <

Implementation of any of the proposed actions would take approximately two years, including one year for appraisal and acquisition of the R.O.W. Implementation dates for the proposed road projects are not known at this time (November 1977) because of the uncertainty of the funding. Construction must be underway by June 1979 to prevent the lapsing of State funds in Act 218 SLH 1974 and Act 195 SLH 1975 for the Hamakua Drive and Kailua Road projects.

III. DESCRIPTION OF ENVIRONMENTAL SETTING

A. Location

The island of Oahu is located between Latitude 21°-15.5' and 21°-43.0' North, and Longitude 157°-39' and 158°-17' West meridian. The island is third in size in the Hawaiian chain with an area of about 608 square miles. The seat of both State and County governments is in Honolulu on the Leeward side of Oahu.

Kailua is located in Windward Oahu in the judicial district of Koolaupoko and includes the surrounding residential areas of Mokapu, Lanikai, Keolu-Enchanted Lake, and further inland, the Pohakupu-Olomana-Maunawili area. The area is almost completely developed except for Maunawili, small portions of Keolu-Enchanted Lake, a periphery strip around Kawainui marsh, and State lands at Olomana. Housing consists predominately of single family residences, with some apartments along Kihapai Street and Kailua Road. Shopping centers are located at Aikahi Tract, Enchanted Lake and Kailua Business areas.

Keolu-Enchanted Lake is part of the tributary area of the Kaelepulu drainage basin and is surrounded on three sides by the ridges of Puu O Ehu, Olomana, and Kaiwa, and on the fourth side by the Kawainui-Kaelepulu Streams. The drainage area of Keolu-Enchanted Lake is approximately 4.4 square miles and includes approximately 3,200 family units. Most

of the urban zoned areas have been developed except for marginal pockets bounded by Akoakoa Street, Kawainui Stream, Puu O Ehu ridge and Kailua Road and the area mauka of Aulepe Street and Akalani Loop in Keolu Hills. Considerable number of developed but vacant lots exist along Kupau Street, Aupapaohe Street, Akele Street, Keolu Drive Loop and Akiahala Street. Possibly up to about 980 additional family units can be accommodated in the present urban zoned areas.

Traffic tributaries outside Keolu-Enchanted Lake proper are located makai of Kawainui Stream and include Kalama-Lanikai, the older Kaelepulu Tract, newer units of Enchanted Lakes Estates Tract, Kailua Garden apartment complex, and the Kailua Road Apartment lots directly abutting Kailua Road within the affected area.

The two highways serving Keolu-Enchanted Lake are Kalaniana'ole Highway and Kailua Road both under the control of the State Department of Transportation. Kalaniana'ole Highway (FAP 61 and 72) begins at the intersection of Pali and Kamehameha Highways at Castle Junction and is the primary highway serving the southeastern portion of Oahu, including the communities of Kailua, Waimanalo, Hawaii Kai, Kuliouou, Niu, Aina Haina and Waialae. Between Castle Junction to Kailua and Saddle City in Waimanalo, it is a four-lane divided highway with limited access within a minimum R.O.W. of 120 feet. The

distance from Castle Hospital junction to Keolu Drive is approximately 1.4 miles. From Saddle City through Waimanalo to Lunalilo Home, Kalaniana'ole Highway is a typical two-lane rural road. Between Hawaii Kai to Waialae-Kahala, its terminus, it is a multi-laned, partially divided, limited access highway, considered by some to be one of the most congested urban highways on Oahu. Hawaii Kai is the proposed eastern terminus of the fixed rail rapid transit system in Leeward Oahu.

Kailua Road (FAP 61) begins at its junction with Kalaniana'ole Highway at Castle Memorial Hospital as a four-lane divided highway with limited access within a minimum R.O.W. of 120 feet. In the Kailua Business district, Kailua Road becomes a City street and feeds traffic into two other streets. Part of the traffic is fed to Oneawa Street which serves Coconut Grove proper as well as a through-street to Mokapu Boulevard. Kuulei Road, the other segment, feeds traffic from Kailua Road to Kalaheo Avenue and Kainalu Drive serving principally Kalama and also through-traffic to Lanikai and Mokapu via South Kalaheo Avenue. From the Oneawa-Kuulei intersection, Kailua Road continues through the central business area and serves through-traffic to Kailua Beach, Lanikai, and Keolu-Enchanted Lake.

Kailua Road is a fully developed roadway within a 80-foot R.O.W. from Oneawa Street to Hahani Street. The existing

Kailua Road from Hahani Street to Kailua Beach Park consists of two 10-foot lanes within a 40-foot R.O.W. The portion proposed to be improved does not have any concrete sidewalks, curbs, gutters, sanitary sewers or storm drains. An irregular shaped asphaltic concrete (AC) sidewalk is located on the makai side beside the ironwood trees. It is frequently congested and subject to flooding. On-street parking is not permitted.

Along the makai R.O.W., abutting properties include the parking lot for Kailua Field and several single-family residences. Kailua Intermediate School is located beyond the one tier of residential lots. The abutting properties on the mauka R.O.W. consist of 2-and 3-story apartment buildings with a total of 240 units. The parking lots of each of the apartment complexes except one abut directly onto Kailua Road. The Church of Latter-Day Saints is also located on the mauka side near the Wanaao Road junction.

The existing Ulumanu Drive is a short street in Pohakupu Tract off Kailua Road. It is classified as a secondary street with a R.O.W. of 60 feet and is about 850 feet long. The pavement width is 20 feet (2 traffic lanes). There are no curbs, gutters, or concrete sidewalks in the Pohakupu subdivision. AC sidewalks were recently installed on Ulumanu Drive in March 1977 with State Aid to Counties' funds.

Ulumanu Drive together with Ulupii Street off Kalaniana'ole Highway are the two access streets into Kailua High School, however, the single entrance is on Ulumanu Drive.

The existing Hamakua Drive originates at the western entrance to Kailua Town off Kailua Road. The portion between Kailua Road and Hekila Street is an improved road with a pavement width of 40 within a R.O.W. of 56 feet and was built as part of the Kailua Semi-Industrial Subdivision in 1957. The portion from Hekila to Hahani Street has an 80-foot R.O.W. and was completed in 1971 as part of the Wyco Industrial Park. At the Enchanted Lake terminus, Hamakua Drive has an 80-foot R.O.W. between Akoakoa Street to Keolu Drive. It terminates in a cul-de-sac off Kaelepulu Pond.

Wanaao Road at one time extended from Kailua Road to Auwinala Road. Beyond this point it was called Keolu Drive. Keolu Drive was subsequently changed to Wanaao Road as part of the subdivision road system of Enchanted Lake. The existing unimproved portion of Wanaao Road is wholly within the older Kaelepulu Tract Extension. Single family residences abut both sides of the existing R.O.W. The unimproved portion has a 20-foot pavement (two lanes) within a 40-foot R.O.W. There are no curbs, gutters, sidewalks or drainage facility. The area is subject to slight flooding during heavy rainstorms and on-street parking is not allowed. The

road curve where Wanaao meets Kakahiaha Street is considered dangerous and a warning light was installed many years ago.

B. Physical Characteristics

According to MacDonald and Kyselka (MacDonald 1967), Oahu was formed during the Mid-tertiary period by volcanic activity. Two volcanoes, the Waianae in the western part of the island and the Koolau in the eastern part, provided the material for the land mass. The Koolau Range is the eroded remnant of the volcano which extends northwestward for 35 miles and serves as the western boundary of the KooIaupoko District.

There are a series of relatively narrow, alluvial coastal plains which lie at the foot of the mountains. A large number of valleys have been carved out of the coastal plains during times of lowered sea level which occurred during the Pleistocene epoch. During the time of higher sea level, coral reefs flourished around the island and built a thick platform that now underlies the coastal plain sediments.

Kawainui Marsh is suspected to be the main vent of the Koolau Volcano (Stearns, 1935). The two ridges separating the Kailua-Maunawili area from Kaneohe to the northwest and Waimanalo to the southeast are composed of lavas from the Koolau and Kailua Volcanoes Series. The upper part of

Maunawili Valley is covered with older alluvium and pyroclastic rocks and basaltic lava flows of the Honolulu Volcanic Series. Younger alluvium extends from Coconut Grove up to Maunawili Valley and around the Keolu-Enchanted Lake area. The coastal area of Kailua Bay is underlain with coral and coral rubble to depths of several hundred feet. The entire Coconut Grove which is about 1 mile in width is composed of dunes, beach deposits and coralline limestone.

1. Climate

The climate of the Hawaiian archipelago is influenced by its marine location which lie beyond the reaches of any continental land masses. The presence of a stationary anticyclonic front to the north and east results in fairly constant trade winds from the north-northeast sector. The prevailing trade winds on Windward Oahu occur about 70 percent of the time at an average velocity of 10.5 mph. The velocity ranges from 6 to 14 mph, however, gusts can reach as high as 29 mph.

The reverse pattern of wind direction, the so-called Kona winds from the South to Southwest is associated with major storms of cyclonic circulation. Kona winds happen about 7 percent of the year with average velocity of 12 mph. Maximum gusts have reached 70 mph.

The average annual temperature is 75 degrees Fahrenheit at sea level and humidities range from 60 to 75 percent. Temperature in Kailua Town ranges from a low of 58 degrees to a high of 90 degrees. Depending on the humidity, the temperature decreases from 3 to 5 degrees per 1,000 feet rise in elevation.

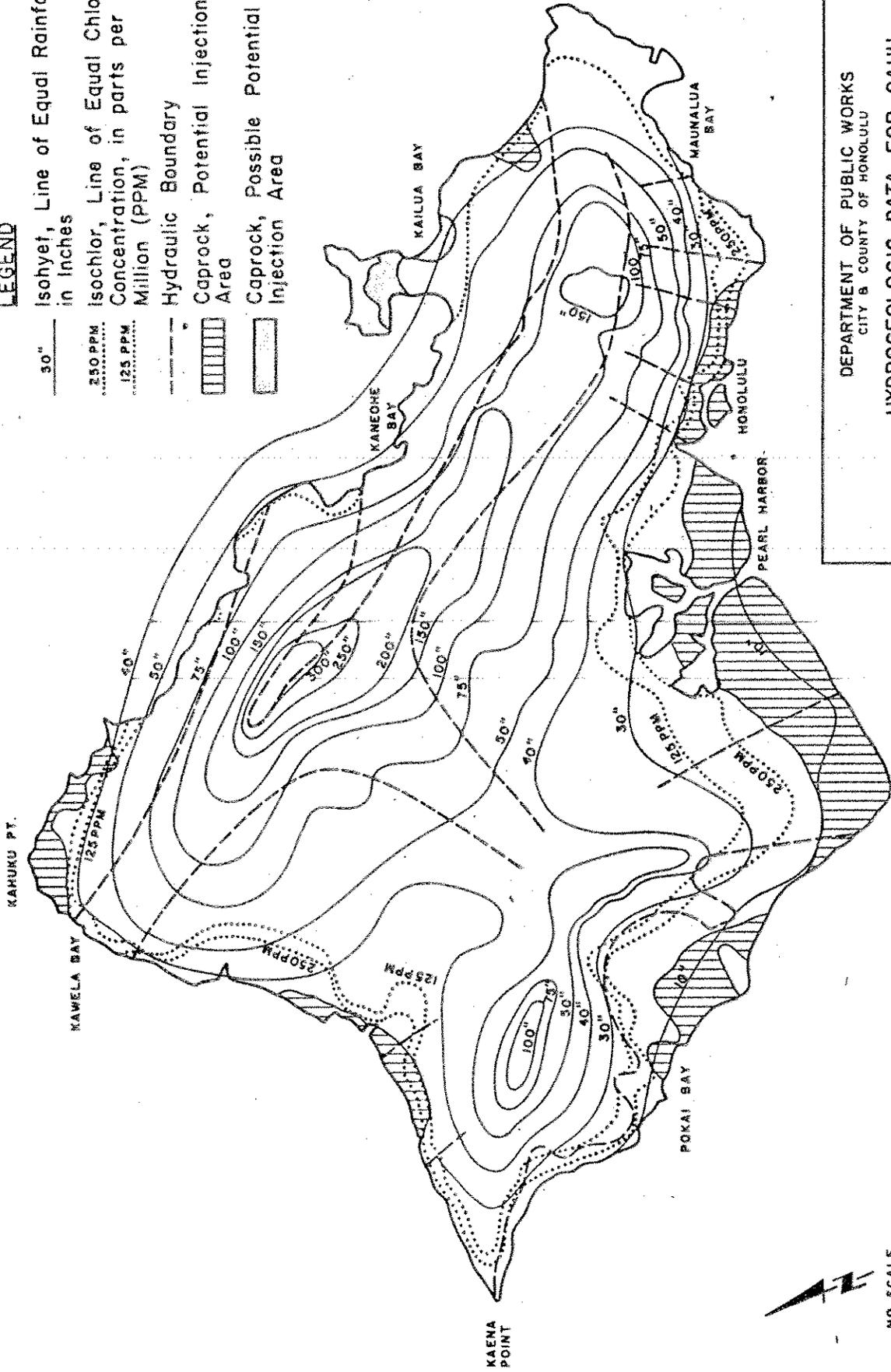
The average annual rainfall in Kailua Town is 44 inches. The maximum recorded rainfall over a 2-day period in the drainage basin was 28 inches at Maunawili Ranch on March 1951. Most of the rainfall on Windward Oahu is attributed to trade winds flow and the orographic effects of the steep topography of the Koolau. A good portion of the remainder is derived from Kona weather storms.

2. Soil Survey and Borings

The soils of the Koolaupoko District are composed of two soil association (Foote, et al, 1972). Shoreline and coastal plain soils belong to the Kaena-Waiialua association. The soils included in this association are "deep, mainly nearly level and gentle sloping, poorly drained to excessively drained having a fine textured to coarse textured subsoil or underlying material." The parent soils in the Kaelepulu Marsh are in this association. The soils in the upland area are in the Lolekaa-Waikane association and are "deep, nearly level to very steep, well-drained, having a dominantly fine-

LEGEND

- 30" — Isohyet, Line of Equal Rainfall, in Inches
- 250 PPM Isochlor, Line of Equal Chloride Concentration, in parts per Million (PPM)
- 125 PPM Isochlor, Line of Equal Chloride Concentration, in parts per Million (PPM)
- Hydraulic Boundary
- ▨ Caprock, Potential Injection Area
- ▩ Caprock, Possible Potential Injection Area



DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

HYDROGEOLOGIC DATA FOR OAHU

**PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU - ENCHANTED LAKE AREA**

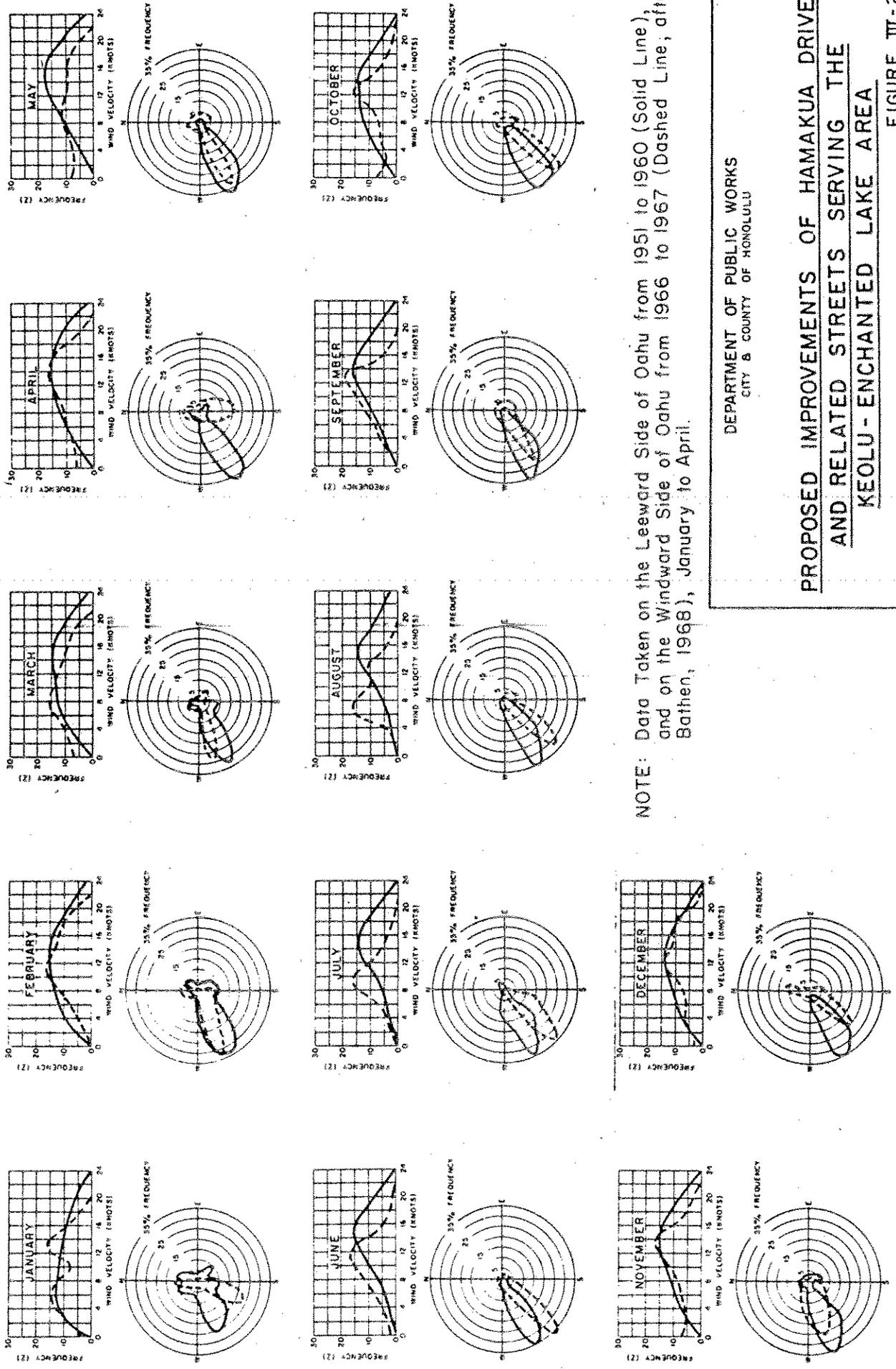
KAILUA, KOOLAUPOKO, OAHU

FIGURE III - 1

Source: From BWS, Honolulu



MONTHLY WIND VELOCITY AND DIRECTION FREQUENCY DIAGRAMS



NOTE: Data Taken on the Leeward Side of Oahu from 1951 to 1960 (Solid Line),
and on the Windward Side of Oahu from 1966 to 1967 (Dashed Line), after
Bathen, 1968), January to April.

DEPARTMENT OF PUBLIC WORKS
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**PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU - ENCHANTED LAKE AREA**

FIGURE III-2

textured subsoil." The soils on Kaiwa, Olomana, and Puu O Ehu Ridges are of this association.

The soils in Coconut Grove and along Kailua Road and Wanaao Road to Kawainui Stream are classified as Jaucas Sand. These soils were developed in wind and water deposited sand from coral and sea shells and the typical profile is about 60 inches deep. The permeability of the soils is rapid and runoff is very slow to slow. Erosion is slight except where vegetation has been removed. Natural vegetation consists of kiawe, koa haole, bristly foxtail, bermuda grass, finger grass and australian salt bush.

Practically all of Enchanted Lake consists of mixed fill. Most of the filled material came from excess excavation during the mass grading of the Kailua Heights subdivisions. Filled soils used included Kokokahi clay, Hanalei silty clay, Papaa clay, Alaeloa silty clay and Ewa silty clay loam, etc. The proposed extension of Hamakua Drive will be on a small remnant of Kaelepulu Marsh which once consisted of about 90 acres.

The soils along Puu O Ehu ridge belong to the Papaa Series and are well drained soils on terraces and alluvial fan. On moderate slopes (6-20%), runoff is slow to medium. On steeper slopes, runoff is medium to rapid. Erosion hazards

are severe on the steeper slopes and slight to moderate on the moderate slopes. These soils are along the alignment of the Ulumanu Drive Extension. The natural vegetation of these soils include guava, Java plum, klu, koa haole, Christmas berry, lantana, sourgrass, and ricegrass. Figure IV-3 is a soil survey map (USDA, SCS 1972) of the affected areas.

Soil boring data were taken along the proposed Hamakua Drive connection during the construction of the Kaelepulu trunk sewer in 1967. The boring log at Hahani Street indicates a surface layer of hardpacked brown grit, clay and gravel underlain by a 13-foot layer of hardpacked brown and fine sand with coral fragments. From elevation (-)9 to (-)19 feet msl, there was a layer of fairly hardpacked to loose fine grey sand. Hard coral rock was encountered at (-)35 feet above which was a layer of loose grey sand, shell and a little silt. The borings at the stream and makai of Akoakoa Street were nearly similar in terms of sequential layers but not in depths (elevations). Fairly hardpacked sand and coral followed by soft-grey sand and coral fragments extended from ground elevation to (-)28 feet at the stream and to (-)41 feet at Akoakoa Street. Below was a 30 feet layer of fairly compact sticky brown clay and grit followed by a layer of fairly hardpacked to hardpacked sand and coral to elevation (-)72 feet at the stream. Fairly hardpacked to hardpacked sand and coral was found at elevation (-)66 feet at Akoakoa



LEGEND

- FL - FILL LAND, MIXED
 - JaC - JAUCAS SAND, 0-15 %
 - MZ - MARSH
 - PYE - PAPAA CLAY, 20-35 % SLOPE
 - PYF - PAPAA CLAY, 35-75 % SLOPE
 - CR - CORAL OUTCROP
- (SEE REFERENCE FOR ADDITIONAL DESIGNATIONS)

DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

**PORTION OF SOIL SURVEY MAP FOR KAILUA
MAUNAWILI, AND LANIKAI, OAHU**
(SOURCE: USDA, SCS 1972)

**PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA**

FIGURE III-3

Street above which was a 25 feet thick layer of fairly hardpacked to soft sand and brown clay. The data from the boring logs indicate that the profile of hardpacked sand and coral is depressed from elevation 0 feet msl to elevation (-)70 feet as one progresses from Hekili Street to Keolu Drive. The coral upcropping at the former quarry site by Ka Awakea and other borings in Coconut Grove and Kawainui marsh indicate that the shoreline at Kailua was considerable inland during the time of higher sea level.

C. Archaeological and Historical Sites

There are no known archaeological and historic sites along Kailua and Wanaao Roads since these areas have been modified and or filled in the past. The alignment of the proposed Hamakua and Ulumanu extensions are along fairly virgin lands which might have historical significance. This is especially true for the undeveloped area between Kawainui Stream and Puu O Ehu and Akoakoa Street block. Other parts of Enchanted Lake and Kailua Garden have been filled or modified and any historical objects that they may have contained are probably destroyed or altered.

According to Handy (1972), "Kailua was the home of the Alii Kualii in the early 18th Century and presumably had been the seat of the high Chief of Koolaupoko from very early times ... the attractiveness of Kailua as a place of residence from an alii nui with his large entourage were the great natural

fishponds, Kaelepulu and Kawainui, and the complex of artificial salt water ponds ... in the Mokapu area." Much of Kailua's charm still remain, including the fine beach, the bay, the salt-water ponds, but the two fresh water ponds are gone. Both fresh water ponds have been overcome by disuse, and vegetation in the case of Kawainui, and land-filling for Kaelepulu.

Kaelepulu fishpond (site 377) is mentioned by McAllister (1933), Cobb (1902), Summers (1964), as a fresh water pond of some importance, possibly several hundred years ago. McAllister described the area along the Hamakua alignment as follows.

"Formerly there were taro patches between the pond and the stream from the Kawainui swamp. The stream was diverted into patches and from the taro terraces ran into Kaelepulu. When the taro land was being dried, there was a ditch which could be used to bring water from the Kawainui stream to the pond. It was from this pond that Ulanui, the celebrated foot-runner, was said to be able to carry a fish by way of Waialua to Waikiki while it was still alive and wriggling."

Handy (1972) described extensive terraced areas along Kawainui and Kaelepulu marshes, and various valleys into the Koolau and concluded that agriculture was intensely pursued in the Kailua Ahupua'a.

Other historical sites mentioned by McAllister in Kailua includes the Ulupo heiau off Kailua Road adjacent to the YMCA, Kawainui pond, Alala heiau in Lanikai, Pahukini heiau located on a hill overlooking Kapaa landfill, Kakuhihewa house at Alele (somewhere in Coconut Grove), several sites on Mokapuu Peninsula including an un-named heiau, Lu O Wai O Kanaloa well, Keawanui fishing shrine and Puu Hawaiiiloa spring, and Kakuipilau heiau at the Koolau Boys Home.

A search through the Hawaii Register of Historic Places as of January 1, 1974, was made. The Register included three sites which have been placed on the National Register of Historic Places (NRHP), and 2 Reserve sites. The NRHP sites include Ulupo heiau, Pahukini heiau and the Mokapu Sand Burials. The Ulupo heiau is a State Park and according to the State Register is said to be very ancient, pre-1778, 19th Century and was constructed by "menehunes." Pahukini heiau is located within the land area of the Kapaa sanitary landfill and is listed as imposing and in good condition by the State Register. The Mokapu Sand Burials is located within the Kaneohe Marine Corps Air Station along the coast between Pyramid Rock and Pukaulua Point. The site is characterized by a "large area with abundance of human skeletal material" by the State.

The two Reserve sites include Kukapoki House Site and the KMCAS Fish Ponds. Kukapoki House Site is located deep in Maunawili Valley beyond the end of the City road, and the latter includes Nuupia, Halekou and Kuluapuhi ponds. Sites placed on NRHP receive the protection of Chapter 6-14, Hawaii Revised Statutes.

Construction of the existing Kaelupulu trunk sewer in 1969 and some questionable grading on the makai slopes of Puu O Ehu have not substantially modified the area. During the construction of the sewer line, a surcharged berm, approximately 5 feet high and 40 feet wide was placed over the line from Kawainui Stream to Keolu Drive loop. Beside these two perturbations, the area appears to be untouched, although there are signs of recent man's activities.

In March 1977, the Kualoa Archaeological Research Team conducted exploratory field surveys along the Hamakua Drive alignment and the surrounding undeveloped areas. The surveyed areas consisted of three sections, including the portion along the alignment makai and mauka of Kawainui Stream, and the undeveloped areas outside the right-of-way (R.O.W.). In the area makai (north) of Kawainui Stream (part of the Lewers & Cooke development), no surface archaeological remains were found because of the extensive grading that was performed previously.

The mound or berm over the trunk sewer, mauka of the stream would have destroyed any surface and subsurface remains during the excavation and backfilling of the sewer. Beyond the toe of the existing berm, but within the proposed R.O.W., several interesting finds were discovered. Evidence of what appeared to be remnants of the ancient auwai irrigation system for taro cultivation was found as reported in the literature. They included the following:

- a. Possibly wall alignment in the southwest side; and
- b. Five basalt embedded stone alignments, possibly agricultural terrace walls in the northeast side.

~~The major finds of the research team were outside of the proposed R.O.W. These findings included the following:~~

- a. A basalt rock structure, 10 feet x 13 feet which may have served as a house site, northeast of the road corridor;
- b. A possibly abandoned agricultural flat, rectangularly shaped, 65 feet by 100 feet, bordered by an auwai on the northeast;
- c. Another possibly agricultural plots, same size, and shaped as above on the southwest;
- d. A possibly unique religious structure (heiau), "T" shaped with dimensions of 138 feet by 33 feet for the top of the "T" and 230 feet by 13 feet for the leg of the "T." Two basalt stone platforms are part of the "T" shaped complex.

The approximate locations of the findings of the field survey are noted in Figure II-1. Further studies are needed to determine the historical significance of the aforementioned archaeological remains. Test pitting and mapping of the remains within the road corridor is being recommended by the Kualoa Team before the area is further disturbed. The report of the team has been transmitted to the State Historic Preservation Office for their evaluation.

The present uses of the area include cattle grazing and open space.

D. Fish and Wildlife

There are two established wildlife refuges in the Kailua area. Both are located within the Kaneohe Marine Corps Station. They include the Nuupia ponds and Ulupau Crater refuges with areas of 443 and 31 acres, respectively. The Nuupia ponds include Nuupia, Halekou and Kuluapuhi ponds with a water area of 398 acres (KMCAS, 1974). The ponds, its adjoining mud flats and marsh areas are being used for breeding, nesting, feeding and resting by endemic (native) waterbirds and as feeding and nesting areas by migratory waterbirds and Noio (Hawaiian term, Anous tenuirostris melanogenys).

Over 100 Hawaiian stilt (Himantopus himantopus knudseni) were observed recently at Nuupia (out of 1,400 left in the world); however, since 1971, the usual number sighted each year has been more than 55. Nuupia ponds are also the homes for the Black-Crowned Night Heron (Nycticorax nycticorax hoactli), Cattle Egret (Bubulcus ibis), Hawaiian Coot (Fulica americana alai), as well as winter migratory birds from Continental North America, including Pintails (Anus acuta), Shovellers (Spatula clypeata), Scaups (Aythya affinis), Bufflehead (Bucephala albeola), Pacific Golden Plover (Pluvialis olomimica fluva), Ruddy Turnstone (Arenaria interpres), Sanderling (Calidris alba), and Wandering Tattler (Heterosulus incanus). The keawe trees along the southern border of the ponds serve a large colony of 850 Cattle Egrets. Twenty-five Koloa Ducks (Anus wyvilliana) were released in the ponds in 1974, and twenty more were released in January 1977.

The Ulupau Crater refuge, located within a portion of the crater in the northeast corner of KMCAS serves as home for a colony of about 1,850 Red-foot Boobies (Sula sula rubripes).

On Moku Manu Island lying about 1 mile offshore, 11 species of seabirds are known to nest there. Three species of Boobies, the Great Frigate Birds (Fregata minor palmerstoni), four species of Terns, two Shearwater species and Bulwer's Petrels (Bulweria bulwerii), have been identified there.

Kawainui and Kaelepulu ponds were once thriving breeding grounds for endemic and migratory birds. Kawainui marsh has lost its attractiveness to water fowl because of its loss of water areas by vegetation. Birds that are known to reside in Kawainui marsh include the Koloa Duck, Hawaiian Gallinule (Gallinula chloropus sandvicvensis), Hawaiian Coot, Black-Crowned Night Heron, Cattle Egrets and feral mallards. Migratory birds which are sometimes seen there in the winter include the Pintail Duck and Shovellers Duck.

Kaelepulu pond still provides a small area of endangered waterbird habitat for stilt, coot and gallinule, although it is completely encircled by residential development. However, the remaining marsh area between Puu O Ehu and Kawainui Stream is still a valuable habitat for endemic, migratory and exotic birds according to State Division of Fish and Game. Four native birds, the Hawaiian Gallinule, Hawaiian Coot, Hawaiian Stilt and the Hawaiian Duck utilize the stream and the surrounding

area for feeding and resting. The area is also being used as nesting habitat for the Hawaiian Gallinule. The Hawaiian Stilt is frequently observed along the low marshland between Kailua Road bridge to Hahani Street.

The four native birds who use the marshland are endangered species and are protected by Federal and State laws. Regulation 6 of the Fish and Game Division forbids the taking, killing or destruction of the nest of any indigenous, endangered or introduced wild birds without a permit from the Department of Land and Natural Resources.

Three species of migratory birds that feed in the low marshland have been identified by the State. They include the Pacific Golden Plover (Pluvialis dominica fulva), Wandering Tattler (Heteroscelus incanus), and the Ruddy Turnstone (Arenaria interpres). The Plover also feeds and rests in open drier area.

Ten species of exotic birds were found in the Kaelepulu marshland by the State and are listed in Table IV-1. One of them, the Cattle Egret, which is found in the Nuupia ponds and Kawainui marsh, uses the area for feeding.

There appears to be no question that the Kaelepulu marshland along the Hamakua Drive connection and the area mauka of Kawainui Stream to Puu O Ehu is valuable as a wildlife habitat. Although surrounded on three sides of urban development (the fourth being Puu O Ehu ridge) wildlife still flourishes and can be observed from Hamakua Drive.

TABLE III-1

FISH AND WILDLIFE RESOURCES IN THE ENVIRONS OF THE PROPOSED
 HAMAKUA DRIVE CONNECTION
 (Source: Division of Fish and Game, DLNR 1977)

Fishes in Kawainui Stream (Kaelepulu)

tilapia, Tilapia mossambica, freshwater-estuarine species; exotic
 medaka, Gambusia affinis, " " " "
 papio, Carangid sp., transient marine species; native
 mullet, Mugil cephalus, " " " "
 awa, Chanos chanos, " " " "
 awaawa, Elops hawaiiensis, " " " "
 oio, Albula vulpes, " " " "
 aholehole, Kuhlia sandvicensis, transient marine species; native
 Samoan crab, Scylla serrata, estuarine-marine species; exotic
 "blue pinch" crab, Thalamita crenata, estuarine-marine species;
 native

Native Birds *

Alae ula (Hawaiian Gallinule) Gallinula chloropus sandvicensis
 Alae keokeo (Hawaiian Coot) Fulica americana alai
 Aeo (Hawaiian Stilt) Himantopus himantopus knudseni
 Koloa (Hawaiian Duck) Anas wyvilliana

Migratory Birds

Kolea (Pacific Golden Plover) Pluvialis dominica fulva
 Ulili (Wandering Tattler) Heteroscelus incanus
 Akekeke (Ruddy Turnstone) Arenaria interpres

Exotic Birds

Cattle egret, Bubulcus ibis
 Lace-necked dove, Streptopelia chinensis
 Indian mynah, Acridotheres tristis
 House finch, Carpodacus mexicanus frontalis
 English sparrow, Passer domesticus
 Ricebird, Lonchura punctulata
 Red cardinal, Richmondia cardinalis
 Brazilian cardinal, Paroaria coronata
 White-eye (Mejiro), Zosterops japonica
 Feral mallard

*All native birds are endangered species.

FISH AND WILDLIFE RESOURCES IN THE ENVIRONS OF THE PROPOSED
HAMAKUA DRIVE CONNECTION (cont)

Exotic Mammals

Feral cat, Felis catus
Mongoose, Herpestes auropunctatus
Rat, Rattus sp.
Mice, Mus musculus

Part of this wildlife also includes exotic mammals consisting of the Feral cat, Felis Catus, Mongoose, Herpestes auropunctatus, Rat, Rattus sp. and Mice, Mus musculus.

Several native and exotic species of freshwater-estuarine and marine fishes are found in Kawainui Stream. Semi-estuarine conditions are found in the Kaelepulu-Kawainui tributary as established by water quality data. Kawainui Stream although improved on the lower reaches has characteristics of natural streams. It is not lined with concrete walls or inverts (bottom), and vegetation and mangrove thrive along both banks of the stream.

Fish life identified by the State includes the tilapia, medaka, papio, mullet, awa, awaawa, oio, aholehole, Samoan crab and "blue pinch" crab. These species are not endangered and are found in waterways connected to the ocean.

Since endangered species are found in the marsh mauka of Kawainui Stream, the proposed Hamakua Drive connection could lead to the destruction of yet another wildlife habitat on Oahu. Between the time when Captain Cook discovered Hawaii and 1968, the U.S. Bureau of Sport Fisheries and Wildlife (Anon. 1968) estimated that 24 species of birds became extinct and another 27 are on the verge of extinction. More bird life has been lost in Hawaii than any area in

the world and the number of birds on the endangered list amount to half the total in the entire United States. The majority of the endangered birds are found in the forests and mountains of Kauai, Hawaii, Molokai and Maui.

According to the Bureau (now the U.S. Fish and Wildlife Service), the primary reduction and destruction of waterfowl have been the filling, draining and alteration of marshes, ponds and other wetlands. The great reduction of rice and taro cultivation has reduced fields which once served as bird habitat from 34,000 acres to a few hundred acres. Other reasons for the reduction of wildlife include:

- a. Introduction of animals which preyed upon birds, including mongoose, rats, feral cats, dogs and pigs;
- b. Loss of habitat by grazing of domestic and feral animals;
- c. Diseases introduced by exotic birds; and
- d. Introduction of exotic plants.

The Bureau recommended the preservation of Kanaka Pond on Maui, Opaepa on Hawaii, and Nuupia Pond and Pearl Harbor on Oahu. Under Section 5 of Public Law 93-205, the Endangered Species Act of 1973, the Secretary of Interior is authorized to acquire lands and water area by purchase, donation or otherwise for the conservation of fish or wildlife which are listed as endangered species or threatened species.

The establishment of a wildlife refuge for the endangered Hawaiian Stilt, Hawaiian Coot, and Hawaiian Gallinule was recently announced by the U.S. Fish and Wildlife in the Kahuku lands of the Campbell Estate (Honolulu Star Bulletin 1977). The James Campbell National Wildlife Refuge has an area of 143 acres and consists of the 105-acre Kii pond and the 38-acre Punamano pond. The Federal agency is also interested in creating a wildlife refuge in Kawainui marsh.

The matter of downzoning the Kaelepulu marsh from industrial and residential to State Land Use Conservation, or CZC Preservation, or State or Federal purchase of the abutting lands was discussed with the Office of Endangered Species, U.S. Fish and Wildlife Service, State Fish and Game, and the City Department of General Planning. The option of acquiring the marsh as a wildlife sanctuary by the Federal or State governments does not appear promising at this time. However, both Federal and State wildlife agencies support the concept of downzoning the marsh, abutting the proposed Hamakua Drive connection.

The area recommended for downzoning is shown on Figure IV-1.

E. Flora

The flora along the affected area of Kailua, Wanaao and Awakea Roads are predominately cultivated and ornamental plants, characteristic of most rural urbanized area. Of the three urban roads surveyed, Awakea Road (Wanaao to Ka Awakea) had the fewest and least stands of mature plants. Practically all of the homes along Kailua and Wanaao Roads had either a hedge, wall or fence. The major trees and hedges included banyan, monkey pod, tecoma, coconut palm, plumeria, ironwood and panax, mock orange, croton and vitex, respectively. None of the flora are endangered.

~~The most conspicuous stands of trees consist of the ironwood,~~
casuarina equisetifolia along the makai (north) side of Kailua Road beginning just past Hahani Street to the Aumoe Road intersection. Within the project area there are 30 trees with average height of about 50 feet. The flora fronting the parking lots of the Kailua Road apartments from Hahani to Aoloa is sparse and consists of pink tecoma, Tabebuia pentaphylla; golden-fruited palm, Chrysalidocarpus lutescens; spider lily, Crinum asiaticum; and kolomana, Cassia surattensis. Between Aoloa and Wanaao junction on the mauka side, vegetation is more dense and includes trees and hedges of california privet, Ligustrum ovalifolium; paper bark, Melaleuca sp.; star jasmine, Jasminum multiflorum; plumerias, Plumeria sp.; fig, Ficus macrophylla; coconut palm,

Cocos nucifera; and mock orange, Murraya paniculata. The flora along Kailua Road is listed in Table III-2 by species and common names.

The major trees along Wanaao Road include the banyan, coconut palm, tecoma and the 30-foot monkey pod at the junction. There are about 45 tecoma trees along Wanaao Road with average heights of 12 feet, and about 88 coconut palms with average heights of 24 feet. The moderately large banyan is located on the corner lot on Pouli Road.

The flora along Wanaao and Awakea Roads are listed in Table III-3 and Table III-4, respectively.

The surrounding area along the Hamakua Drive connection is fairly densely covered with vegetation, grasses, weeds, shrubs and mangroves. For convenience, the surveyed areas were divided into four sections: (1) the upper slopes along the marsh; (2) the marsh; (3) Kawainui Stream; and (4) the Kailua Town side of the proposed roadway. According to the survey by Smith (1977), 54 taxa were found in the affected area and no rare or endangered plants were found.

The upper slopes of the marsh as well as the berm over the sewer line are dominated by haole koa, Leucaena leucorephala; kiawe, Prosopis pallida; and various herbs which are mostly

TABLE III- 2

PLANT SPECIES* FOUND ADJACENT TO KAILUA ROAD,
HAHANI STREET TO WANAAO ROAD JUNCTION
(Source: Smith 1977)

<u>Species Name</u>	<u>Common Name</u>
<u>Polyscias guilfoylei</u> (Bull) Bailey	panax ^s
<u>Scaevola taccada</u> (Gaertn.) Roxb.	beach naupaka ^s
<u>Murraya paniculata</u> (L.) Jack	mock orange ^s
<u>Hibiscus</u> sp. (cultivar)	hibiscus ^s
<u>Codiaeum variegatum</u> (L.) Bl.	croton ^s
<u>Casuarina equisetifolia</u> Stickm.	ironwood ^t
<u>Schinus terebinthefolius</u> Raddi	Christmas berry ^t
<u>Vitex trifolia</u> L.	blue vitex ^s
<u>Delonix regia</u> (Bojer.) Raf.	royal poinciana ^t
<u>Samanea saman</u> (Jacq.) Merr.	monkeypod ^t
<u>Tabebuia pentaphylla</u> (L.) Hemsl.	pink tecoma ^t
<u>Chrysalidocarpus lutescens</u> (Bory) Wendl.	golden-fruited palm ^t
<u>Crinum asiaticum</u> L.	spider lily ^h
<u>Cassia surattensis</u> Burm.	kolomona ^t
<u>Melaleuca</u> sp.	paper bark ^t
<u>Ligustrum ovalifolium</u> Hassk.	California privet ^s
<u>Plumeria obtusa</u> L.	Singapore plumeria ^t
<u>Plumeria rubra</u> L.	red plumeria ^t
<u>Pandanus</u> sp.	lauhala ^t
<u>Jasminum multiflorum</u> (Burm.) Andr.	star jasmine ^s
<u>Cocos nucifera</u> L.	coconut palm ^t
<u>Polyscias</u> sp.	panax ^s

*Nomenclature according to St. John (1973).

Shrub - s
Herb - h
tree - t

TABLE III- 3

PLANT SPECIES* FOUND ADJACENT TO WANAAO ROAD
KAILUA ROAD JUNCTION TO AUWINA STREET
(Source: Smith 1977)

<u>Species Name</u>	<u>Common Name</u>
<u>Tabebuia pentaphylla</u> (L.) Hemsl.	pink tecoma ^t
<u>Crinum asiaticum</u> L.	spider lily ^h
<u>Wedelia trilobata</u> (L.) Hitchc.	wedelia ^h
<u>Hibiscus</u> sp. (cultivar)	hibiscus ^s
<u>Melaleuca</u> sp.	paper bark ^t
<u>Plumeria obtusa</u> L.	Singapore plumeria ^t
<u>Plumeria rubra</u> L.	red plumeria ^t
<u>Pandanus</u> sp.	Lauhala ^t
<u>Ficus macrophylla</u> Desf.	Moreton Bay Fig ^t (Banyan)
<u>Cocos nucifera</u> L.	coconut palm
<u>Polyscias guilfoylei</u> (Bull) Bailey	panax ^s
<u>Murraya paniculata</u> (L.) Jack	mock orange ^s
<u>Cordyline terminalis</u> (L.) Kunth	ti ^s
<u>Codiaeum variegatum</u> (L.) Bl.	croton ^s
<u>Acalypha hispida</u> Burm.	chenille plant ^s
<u>Ficus carica</u> L.	edible fig ^t
<u>Breynia disticha</u> Forst.	sweetpea bush ^s
<u>Schinus terebinthefolius</u> Raddi	Christmas berry ^t
<u>Vitex trifolia</u> L.	blue vitex ^s
<u>Polyscias</u> sp.	panax ^s
<u>Delonix regia</u> (Bojer.) Raf.	royal poinciana ^t
<u>Samanea saman</u> (Jacq.) Merr.	monkeypod ^t
<u>Brassaia actinophylla</u> Endl.	octopus tree ^t
<u>Dracaena</u> sp.	^s
<u>Ixora casei</u> Hance ex Walp.	ixora ^s
<u>Araucaria heterophylla</u> (Salisb.) Franco	Norfolk Isl. pine ^t
Unidentified leguminose tree, probably a <u>Cassia</u> sp.	^t
<u>Psidium guajava</u> L.	guava ^t
<u>Nerium oleander</u> L.	oleander ^s
<u>Hibiscus tiliaceus</u> L.	hau ^s
<u>Araucaria columnaris</u> (Forst.) Hook	Cook pine ^t
<u>Graptophyllum pictum</u> (L.) Nees ex Griff.	caricature plant ^s
<u>Acalypha wilkesiana</u> Muel.-Aarg.	beefsteak plant ^s
<u>Pyrostegia venusta</u> (Ker.-Gawl) Miers	flame flower ^s
<u>Juniperus</u> sp.	cedar ^s

*Nomenclature according to St. John (1973)

Shrub - s

Herb - h

Tree - t

TABLE III- 4

PLANT SPECIES* FOUND ADJACENT TO AWAKEA ROAD
 WANAAO ROAD TO KA AWAKEA ROAD
 (Source: Smith 1977)

<u>Species Name</u>	<u>Common Name</u>
<u>Tabebuia pentaphylla</u> (L.) Hemsl.	pink tecoma ^t
<u>Melaleuca</u> sp.	paper bark ^t
<u>Plumeria rubra</u> L.	red plumeria ^t
<u>Ficus macrophylla</u> Desf.	Moreton Bay Fig ^t
<u>Cocos nucifera</u> L.	coconut palm ^t
<u>Polyscias guilfoylei</u> (Bull) Bailey	panax ^s
<u>Codiaeum variegatum</u> (L.) Bl.	croton ^s
<u>Ficus carica</u> L.	edible fig ^t
<u>Brassaia actinophylla</u> Endl.	octopus tree ^t
<u>Dracaena</u> sp.	^s
<u>Ixora casei</u> Hance ex Walp.	ixora ^s
<u>Araucaria heterophylla</u> (Salisb.) Franco	Norfolk Isl. pine ^t
<u>Araucaria columnaris</u> (Forst.) Hook	Cook pine ^t
<u>Clusia rosea</u> Jacq.	Scotch attorney ^t
<u>Strelizia reginae</u> Banks	bird-of-paradise ^h
<u>Bambusa</u> sp.	golden bamboo ^s
<u>Carissa macrocarpa</u> (Eckl.) D.C.	natal plum ^s

*Nomenclature according to St. John (1973)

Shrub - s
 Herb - h
 Tree - t

weeds. The soils in the low marsh was found to be a mixohaline with salinities as high as 18,000 parts per million. The marsh area is characterized by the lush akulikuli-kai (Batis maritima) meadows interspersed with Pluchea sp., and mangroves.

Mangroves and the knottgrass, Paspalum distichum, were found along Kawainui Stream. The mangrove stands are well rooted with heights from 14 to 20 feet. Floating water lettuces, Pistia stratiotes, were also found. The Kailua Town side of the road is predominantly weedy scrubs including Pluchea sp.; haole koa, california grass, Brachiaria mutica and other grasses. Abundant growth of several herbaceous species, mostly weeds, was also found. A small banyan tree will not be affected by the proposed project. The plant list along the Hamakua Drive connection is found in Table III-5.

TABLE III- 5

PLANT SPECIES* FOUND IN KAELEPULU MARSH
 HAMAKUA DRIVE CONNECTION
 (Source: Smith 1977)

<u>Family Name</u>	<u>Common Name</u>
Acanthaceae	
<u>Asystasia gangetica</u> (L.) Anders.	Asystasia
Aizoaceae	
<u>Sesuvium portulacastrum</u> (L.) L.	akulikulu
Amaranthaceae	
<u>Amaranthus spinosus</u> L.	spiny amaranth
Anacardiaceae	
<u>Schinus terebinthefolius</u> Raddi	Christmas berry
Araceae	
<u>Pistia stratiotes</u> L.	water lettuce
Batidaceae	
<u>Batis maritima</u> L.	akulikuli-kai
Casuarinaceae	
<u>Casuarina equisetifolia</u> Stickm.	ironwood
Chenopodiaceae	
<u>Chenopodium oahuense</u> (Mey.) Aellen	goosefoot
Commelinaceae	
<u>Commelina benghalensis</u> L.	hairy honohono
Compositae	
<u>Emilia sonchifolia</u> (L.) D.C.	Flora's paintbrush
<u>Pluchea indica</u> (L.) Less.	Indian pluchea
<u>Pluchea odorata</u> (L.) Cass.	Sour bush
<u>Sonchus oleraceus</u> L.	sow thistle
Cyperaceae	
<u>Cyperus rotundus</u> L.	nut grass
<u>Scirpus paludosus</u> A. Nels	alkali bulrush
Euphorbiaceae	
<u>Phyllanthus debilis</u> Klein ex Willd.	phyllanthus weed
<u>Ricinus communis</u> L.	castor bean
Graminae	
<u>Brachiaria mutica</u> (Forsk.) Stapf.	California grass
<u>Cenchrus echinatus</u> L.	sandbur
<u>Chloris inflata</u> Link.	swollen finger grass
<u>Cynodon dactylon</u> (L.) Pers.	Bermuda grass
<u>Digitaria violascens</u> Link.	Unknown
<u>Panicum maximum</u> Jacq.	Guinea grass
<u>Paspalum conjugatum</u> Berg.	Hilo grass
<u>Paspalum distichum</u> L.	knottgrass

TABLE III- 5

PLANT SPECIES* FOUND IN KAELEPULU MARSH
 HAMAKUA DRIVE CONNECTION
 (Source: Smith 1977)

<u>Family Name</u>	<u>Common Name</u>
<u>Paspalum fimbriatum</u> H.B.K.	Panama paspalum
<u>Pennisetum verticillatum</u>	Unknown
<u>Rhynchelytrum repens</u> (Willd.) Hubb.	Natal redbtop
<u>Sorghum halapense</u> (L.) Pers.	Johnson grass
Graminae	
<u>Trichachne insularis</u> (L.) Nees	sour grass
Leguminosae	
<u>Cassia surattensis</u> Burm.	kolomona
<u>Cassia leschenaultiana</u> D.C.	partridge pea
<u>Desmanthus virgatus</u> (L.) Willd.	slender minosa
<u>Desmodium canum</u> (Gmel.) Schinz & Thell.	Spanish clover
<u>Erythrina variegata</u> ? Stickm.	tiger's claw
<u>Indigofera suffruticosa</u> Mill.	indigo plant
<u>Leucaena leucocephala</u> (Lam.) de Wit	haole koa
<u>Mimosa pudica</u> L.	sleeping grass
<u>Prosopis pallida</u> (Humb & Bonpl. ex Willd.) HBK	kiawe
Malvaceae	
<u>Abutilon grandifolium</u> (Willd.) Sweet	hairy abutilon
<u>Hibiscus tiliaceus</u> L.	hau
<u>Malvastrum coromandelium</u>	false mallow
<u>Sida spinosa</u> L.	prickly sida
Myrtaceae	
<u>Psidium guajava</u> L.	guawa
Oxalidaceae	
<u>Oxalis corniculata</u> L.	yellow wood sorrel
Passifloraceae	
<u>Passiflora foetida</u> L.	pohapoha
Portulacaceae	
<u>Portulaca oleracea</u> L.	purslane
Rhizophoraceae	
<u>Bruguiera gymnorhiza</u> (L.) Lam.	oriental mangrove
Scrophulariaceae	
<u>Bacopa monniera</u> (L.) Wettst.	water hissop
Solanaceae	
<u>Nicotiana glauca</u> Grah.	wild tobacco
<u>Solanum nigrum</u> L.	black nightshade

TABLE III- 5

PLANT SPECIES* FOUND IN KAELEPULU MARSH
 HAMAKUA DRIVE CONNECTION
 (Source: Smith 1977)

<u>Family Name</u>	<u>Common Name</u>
Sterculiaceae	
<u>Waltheria americana</u> L.	waltheria
Verbenaceae	
<u>Lantana camara</u> L.	lantana
<u>Stachytarpheta cayennensis</u> (Rich.) Vahl	Cayenne vervain

*Nomenclature according to St. John (1973)

F. Flood Control

The primary influence on the drainage and flood control master plan for the Maunawili Valley drainage district which includes Kailua Town and Keolu-Enchanted Lake is the Kawainui Flood Control project. The construction of the Kawainui Flood Control project was initiated in July 1964 and completed in December 1965 to provide flood protection for the Coconut Grove Area of Kailua. The project was constructed by the United States Army Corps of Engineers and included (1) widening and deepening of Oneawa Channel (Kawainui Drainage Canal) from the upstream marsh entrance to the ocean, a distance of 9,100 feet; (2) a silt basin on the upstream end and a ~~riprap stub groin at the mouth of the channel at Kapoho~~ Point; (3) an earth levee 10-foot high along the entire Kailua side of the marsh, mauka of Kawainui Stream about 8,700 feet long; and (4) a ponding area of 640 acres in Kawainui Marsh.

In addition to the drainage requirements of the Kawainui tributary areas, the drainage master plan for the Coconut Grove and Kailua Town areas requires a 100-foot wide channel between the marsh levee and the private properties to carry storm runoff to the junction with the Kaelepulu Stream off Wanaao Road.

The preliminary report for the flood control project which was authorized by Congress on August 1939 was completed in 1940. Subsequently, a survey report was authorized and completed in 1941. The survey report was revised in 1948 and submitted to Congress where the project was authorized on May 1950. The original design provided for a flow capacity of 6,400 cubic feet per second (cfs) for Oneawa Channel, using the full 740 acres of the marsh for a flood routing area at a water surface elevation of 4.8 feet. The design was completed in 1957.

As the results of severe flooding of Coconut Grove in March 1951 when a total of 28.25 inches of rainfall was recorded at Maunawili Ranch over a two-day period, the Territory of Hawaii completed construction of the original channel and a bridge on Kalaheo Road on July 1952.

The storm of March 1951 resulted in a peak flow of 12,300 cfs in the marsh in contrast to the original 6,400 cfs design for a 100-year storm. Accordingly, the design was revised to anticipate a peak inflow of 18,100 cfs into the marsh, routed through the marsh at a water surface elevation of 6.6 feet with a maximum channel discharge of 6,900 cfs in Oneawa Channel. The surface area of inundation was 640 acres for a required storage volume of 3,000 acre-feet.

Construction of the 10-foot high earth levee mauka of Kawainui Stream effectively blocked the Maunawili storm flows from using the Kaelepulu tributaries as an outlet into the ocean at Kailua Beach Park. With the diversion completed, Kawainui Stream now originates in an unlined channel just mauka of Kainui Drive and is separated from Oneawa Channel by a small causeway. The stream runs along the mauka edge of Coconut Grove, curves around Kihapai Place, and crosses Kailua Road mauka of Kainehe Street and Hamakua Drive for a distance of approximately 6,500 feet. The water depth of this portion of the stream is about 10 feet and the invert is about (-) 6.0 feet msl.

The stream then meanders through the Kailua industrial area and flows between the Papalani and Auwina Streets residential blocks to its confluence with the main Kaelepulu Stream. The total length of Kawainui Stream (Kaelepulu Stream) is about 12,000 feet. The first 2,600 feet upstream of the confluence consists of an unlined trapezoidal channel with a base of 70 feet and side slopes of $1\frac{1}{2}$ to 1 (horizontal to vertical) within a right-of-way of 105 feet. Another 3,000 feet around the industrial area is partially improved with a channel base of 35 feet. Between Hahani Street to near the end of Auwini Street, the stream is unimproved.

The proposed Hamakua bridge crossing is over an unimproved section of the stream. The width of the stream at the

crossing is about 75 feet and the invert is about (-)3 feet msl. The Hamakua bridge will be the fourth over Kawainui Stream. The others are at Wanaao Road, Ka Awakea Street and Kailua Road.

Kawainui Stream drains a major portion of the surface runoff from the Coconut Grove area, the Kailua Business District and portions of Enchanted Lake area. The total watershed area is 892 acres and the design flow is 2,500 cfs.

The main Kaelepulu channel extends from its mouth at the Kailua BeachPark to Kaelepulu Pond, a distance of 8,000 feet. The first 5,000 feet of the main channel beginning from the beach consists of an unlined channel with a base varying from 148 to 164 feet and side slopes of 2 to 1. The remainder of the stream consists of a channel section with a maximum base of 45 feet and side slopes of 3 to 1. Kaelepulu Pond has been filled to about 50 percent of its original area to serve as homesites for the Enchanted Lake subdivisions. The pond which once was a 216-acre fish pond has an area of only 125 acres now and serves as a storage area and collects surface runoff from the Keolu Hills and Enchanted Lake areas. The total area of the Kaelepulu watershed is 3,698 acres, and the design flow is 7,200 cfs.

Water levels in the Kaelepulu waterways are controlled by a wave-built sand berm at the mouth of stream at the Kailua

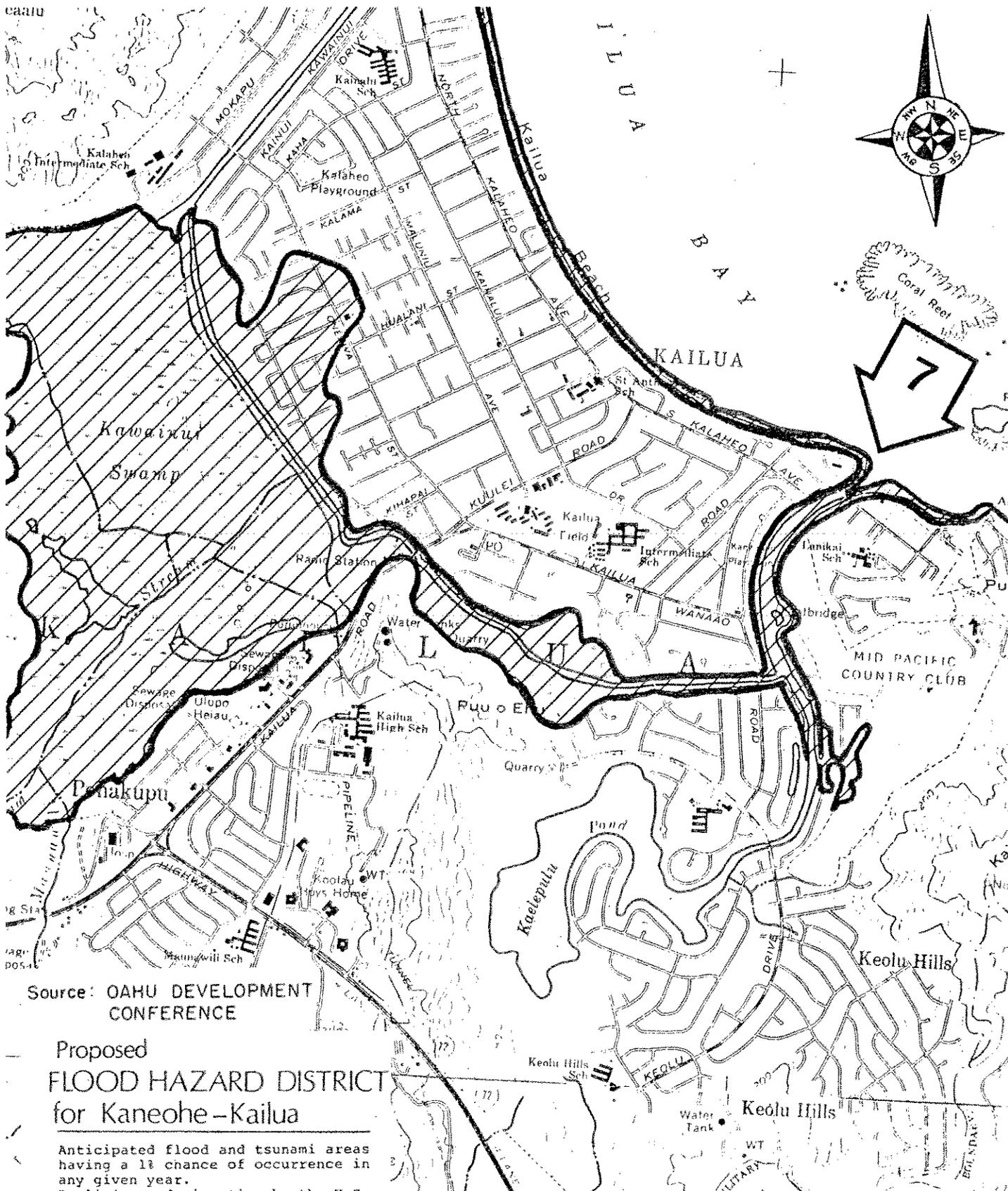
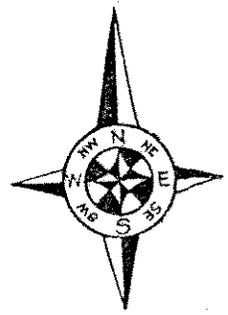
Beach Park. During heavy storms, the blocked mouth is cleared by heavy equipment of the Department's Division of Road Maintenance. Water surface elevation of the waterways under normal conditions with the mouth blocked is about 2-3 feet above mean sea level. During heavy storms, the surface elevation is determined by the diurnal tides. The invert of the main channel is (-) 8.00 feet msl for Kaelepulu Stream and (-) 7.00 feet msl for Kawainui Stream.

Plans call for the future widening of the unimproved and partially improved sections of Kawainui Stream to a full 70-foot base with $1\frac{1}{2}$ to 1 side slopes and an invert of (-) 7.00 feet msl. These improvements will probably be implemented when the undeveloped industrial, apartment and residential lands adjacent to the stream are developed. During the construction of the proposed Hamakua bridge, the stream will be widened to its master planned width upstream and downstream of the bridge abutment.

A review of the most recent proposed flood hazard map of Kailua showed that Kawainui marsh, portions of Coconut Grove around Kihapai Street, and Oneawa Street, the adjacent area to the entire reach of Kawainui Stream as well as the surrounding area of Kaelepulu Stream from Kailua Beach to the vicinity of Ikemaka Place in Enchanted Lake, are subject to flooding. The proposed flood hazard areas are shown in

Figure III-4. The low lying marsh lands in the undeveloped industrial and residential areas on the mauka side of the stream below Puu O Ehu would be subject to flooding and would require considerable amount of earth fill to raise the existing ground elevations which are as low as 1.5 to 4.5 feet above msl. The alignment of the proposed Hamakua Drive Extension will be through this flood hazard area. Any improvement in this area would have to meet the Federal 100-year flood requirements. Kailua Road which is subject to severe flooding and Wanaao Road to a lesser extent would be provided with an underground storm drain system if they were improved with outlets into Kawainui Stream. The improvements to Kailua Road would include an underground storm drain system consisting of pipes ranging in sizes from 24 to 60 inches in diameter. The 60-inch line will be laid alongside an easement beginning at the Ewa boundary of the Church of Latter Days Saints in the southerly direction with the outlet at Kawainui Stream as shown in Figure II-2.

Drainage facilities for Hamakua Drive Extension and Wanaao Road are still in the preliminary planning stage. Both areas are tributary to Kaelepulu Stream, hence, all storm runoffs will be directed into this stream. The storm drainage system for Wanaao will include catch basins and drain lines and will be laid within the R.O.W. The outlets to the main channel will be through easements and located



Source: OAHU DEVELOPMENT CONFERENCE

Proposed FLOOD HAZARD DISTRICT for Kaneohe-Kailua

Anticipated flood and tsunami areas having a 1% chance of occurrence in any given year. Preliminary designation by the U.S. Corps of Engineers, Fall of 1976. Subject to review and modification.

Consult maps on file at the Dept. of Land Utilization for boundary locations and requirements for construction within the District.

- Dark Shaded areas indicate the Flood Hazard District.
- Numbers indicate anticipated maximum tsunami level (in feet).

DEPARTMENT OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

PORTION OF PROPOSED FLOOD HAZARD DISTRICT FOR KANEOHE-KAILUA

PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE AND RELATED STREETS SERVING THE KEOLU-ENCHANTED LAKE AREA

FIGURE III-4

as shown in Figure II-4. The Hamakua drainage system will include catch basins and drain lines within the proposed R.O.W. with discharge into Kawainui Stream.

The proposed Kailua Road drains vary from 30 to 60 inches in diameter and will serve portions of the Kailua central business area and Kaelepulu Tract. The alignment and discharge outlet are as shown in Figures II-2 and II-4. Other proposed and existing drains are shown in Figure II-4.

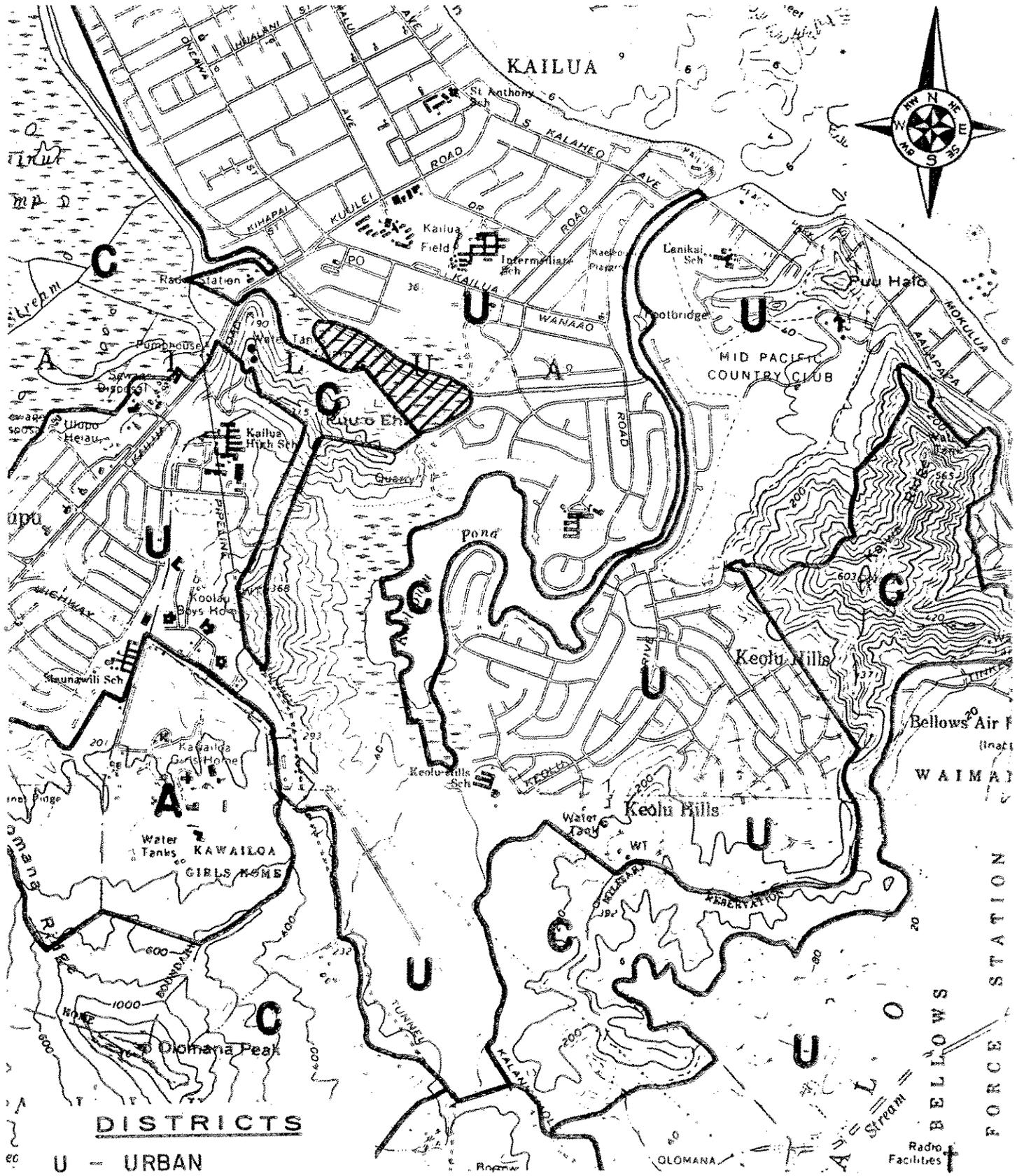
As implied earlier, it is doubtful whether the present unimproved or partial improved portions of Kawainui Stream will be channelized if the marsh remains undeveloped or is downzoned. If the marsh is developed into residential and industrial lots, the size, shape and material used for the channelized stream would be similar to those used for the existing sections of the stream.

The elevation of the soffit for the new Hamakua bridge crossing over Kawainui Stream will be established at 7.5 feet to provide for a minimum clearance of 6 feet. This clearance was requested by the City Department of Parks and Recreation since potential canoeing activities exist, upstream of the Ka Awakea Road bridge. The elevations of the soffit of the existing bridges over Kawainui Stream at Kailua Road, Ka Awakea Road and Wanaao Road are 7.75 feet, 3.00 feet and 6.00 feet, respectively.

IV. LAND USE RELATIONSHIP

Land use on Oahu are regulated by the State Land Use Commission and the City Council. All lands in the State are classified and grouped into four land use districts including urban, rural, agricultural, and conservation. The rural designation is not applicable to the City and County. Boundaries for districts are established by the Commission and are periodically reviewed every five years. The most recent land use map for the affected area is shown on Figure IV-1. Conservation districts are governed by the Department of Land and Natural Resources.

Land use and zoning on the County level are administered by the Departments of General Planning (DGP) and Land Utilization (DLU), reviewed by the Planning Commission and adopted through ordinance by the City Council. DLU also administers the special district, flood hazard, and special management area programs. The General Plan for Oahu (GP) and Detailed Land Use Map (DLUM) adopted in 1964 for Kailua, Lanikai, Maunawili and Waimanalo, and portion of the Development Plan (DP) for Kailua adopted in 1971 are the principal land use documents for Kailua and the affected area. The GP and DLUM for the Keolu-Enchanted Lake area are shown in Figures IV-2 and IV-3. The 1964 DLUM and the 1971 DP established primary and secondary streets R.O.W. width as shown in Figure IV-4.



DISTRICTS

- U - URBAN
- R - RURAL
- A - AGRICULTURAL
- C - CONSERVATION
- Area recommended for downzoning by USDI, Fish & Wildlife Services.

DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU
PORTION OF STATE LAND USE DISTRICT MAP
FOR KAILUA, KOOLAUPOKO, OAHU
PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA

FIGURE IV-1





In January 1977, the General Plan for the City and County of Honolulu was adopted. The new GP is a document which consists of two parts. First, it states "the long-range social, economic, environmental, and design objectives" for the people of Oahu to the year 2000. Second, it states "the broad policies which the City and County government believes are necessary to carry out" the objectives of the Plan. The GP document will be supplemented by Development Plans (maps) which are in the process of being prepared by the Department of General Planning. For the Kailua area, work on the DP will begin hopefully within an 18-month period. The 1964 GP and DLUM, and the 1971 DP will remain in effect until superseded by the new DP.

Portions of the new GP which are applicable to the proposed actions include population, natural environment, transportation, public safety and culture.

1. Population

Objective C - "To establish a pattern of population distribution that allows the people of Oahu to live and work in harmony."

Policy 4 - Policy 4 established Kailua as an urban-fringe area with a population of 49,000 people for the year 2000 or 4.7 percent of Oahu's 2000 population.

3. Natural Environment

Objective A - "To protect and preserve the natural environment of Oahu."

Policy 5 - "Design surface drainage and flood-control systems in a manner which will help preserve their natural settings."

Policy 6 - "Protect the natural environment from damaging levels of air, water, and noise pollution."

Policy 7 - "Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu."

Policy 8 - "Protect mature trees on public lands and encourage their integration into new developments."

Objective B - "To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors."

Policy 1 - "Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fish-ponds, and bays; ..."

Policy 3 - "Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea."

5. Transportation

Objective A - "To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost"

Policy 3 - "Provide transportation services for people living outside the Pearl City-Hawaii Kai corridor primarily through a system of express-and feeder-buses and limited to moderate highway improvements."

Policy 4 - "Improve transportation facilities and services ... in the trans-Koolau corridors to meet the needs of ... Windward communities."

Policy 5 - "Improve roads in existing communities to reduce congestion and eliminate unsafe conditions."

Objective D - "To maintain transportation ... system which will help Oahu continue to be a desirable place to live and visit."

Policy 1 - "Give primary emphasis in the capital improvement program to the maintenance and improvement of existing roads ..."

Policy 4 - "Evaluate the social, economic, and environmental impact of additions to the transportation ... system before they are constructed."

Policy 5 - "Require the installation of underground utility lines wherever possible."

7. Public Safety

Objective B - "To protect the people of Oahu and their property against natural disaster" ... and "traffic ..."

Policy 2 - "Reduce hazardous traffic conditions."

Policy 5 - "Require all development in areas subject to floods ... to be located and constructed in a manner that will not create any health or safety hazards."

9. Culture

Objective A - "To foster the multiethnic culture of Hawaii."

Policy 3 - "Preserve and restore, to the extent possible, ... sites of historic and cultural significance including those on the State and National registers."

The in-depth traffic analysis which the City Department of Transportation Services (DTS) completed in mid 1977, indicated that the R.O.W. widths of the primary and secondary access roads serving Keolu-Enchanted Lake as shown on the GP, DLUM and DP should be revised. The recommended R.O.W. widths included the reduction of Hamakua Drive R.O.W. from Hahani Street to Akoakoa Street, from 80 feet to 70 feet; reduction of Kailua Road R.O.W. from Hahani Street to Wanaao Road junction, from 80 feet to 56 feet; and reduction of Wanaao Road R.O.W., from 60 feet to 56 feet between Kailua Road junction to Auwina Street to 56 feet, and the retention of the 80-foot R.O.W. of Hamakua between Kailua Road and Hekili Street.

In addition to R.O.W. widths reductions, DTS is recommending that the GP extension of Ulumanu Drive through Kailua High School to Keolu Drive loop be eliminated. This recommended change by DTS is expected to be supported by the Department of Education and the Pohakupu community who have long opposed the implementation of this GP access road.

Major controversies are not anticipated also for the recommended R.O.W. reductions of Kailua Road and Wanaao Road. Some of the affected residents along those streets have consistently been opposed to widening of these roads to their GP R.O.W. width.

Prior to the improvements of any of the access roads serving Keolu-Enchanted Lake, a DP Amendment will have to be made. DTS will be the lead agency to initiate the DP changes. At this point of time (September 1977), coordination between the DP amendment and starting dates for construction may be critical only for the Hamakua Drive improvements. According to the DP Work Plan of the Department of General Planning, the DP for Kailua has been tentatively scheduled for completion and adoption by mid 1979.

A more realistic adoption date, however, is late 1979 or early 1980 because some slippages in the schedule have already occurred. Therefore, if it is desired to complete the improvements of the Hamakua Drive connection before 1980, the DP amendment for this project should be initiated as soon as possible.

One of the secondary effects of constructing the Hamakua Drive connection will be the resultant urbanization of the surrounding marsh into residential and industrial lots. This is likely to occur since these lands are already zoned for R-6 residential and industrial. As pointed out earlier, the existing marsh served as a habitat for four native waterbirds on the endangered species list as well as other migratory and exotic birds. The Federal Fish and Wildlife Service and the State Fish and Game Division have agreed

to support the concept of downzoning the marsh to State Land Use Conservation or CZM Preservation to protect the existing wildlife. The adjacent Kawainui marsh and Puu O Ehu ridge and makai slopes are already in the conservation district, but apparently the Kaelepulu marsh was not considered since urbanization and filling of Kaelepulu pond has taken place. Any actions taken to downzone the marsh must be by others, since this action is outside DPW area of responsibility. This action is likely to be strongly opposed by the affected land owner(s).

V. ENVIRONMENTAL IMPACT OF THE PROPOSED ACTIONS AND
PROPOSED MITIGATION MEASURES

A. Introduction

There are several impacts which the proposed actions will have on the physical and social environments of the affected area. These impacts include direct and indirect impacts, beneficial and adverse impacts, and short term and long term impacts. These impacts can be further classified into primary effects and secondary effects. The proposed actions will probably have much more micro-scale impacts than macro-scale or regional impacts. Micro-scale impacts are those related to impacts which would primarily affect properties nearby or abutting the proposed actions.

Regional impacts of the proposed actions include traffic circulation and congestion from the road projects, and water quality from the flood control and drain projects. The other environmental impacts are considered on the micro-scale and include construction, ambient noise, air quality, natural ecological resources, social, relocation, wetland, stream modification and flood hazard.

Each of the potential impacts of the various actions were analyzed and evaluated with respect to ambient (surrounding) conditions and or standards adopted as part of the State Department of Health public health regulations (PHR) series.

The PHRs include Chapter 37-A, Water Quality Standards; Chapter 37-B, Conservation Standards; Chapter 42, Ambient Air Quality Standards; Chapter 43, Air Pollution Control; Chapter 44-A, Vehicle Noise Control For Oahu; and Chapter 44-B, Community Noise Control For Oahu. Chapter 37-B has been supplemented by the City and County Soil Erosion Standards and Guidelines (November, 1975) and made a part of Chapter 23, R.O. 1969, as amended.

B. Construction

Construction impacts are considered short term, direct and indirect, and may have primary and secondary effects. Under this category are the impacts associated with grubbing, excavation, filling and grading.

Grubbing is the removal and clearing of land of vegetation, shrubs, minor trees, and other ground cover. Grubbed materials will not be stockpiled at the site(s) nor burned but will be hauled to the Kapaa Quarry landfill or another approved site for disposal. All ground cover within the selected R.O.W. will be affected, including the existing pavement on Kailua and Wanaao Roads and Hamakua Drive.

Filling and grading will be required for the road projects. Considerable amount of filled material will be required for

the Hamakua Drive connection. The selected fill and sub-base material for the roadway will be imported; however, its source is not known at this time.

Excavation will be required for utility lines, storm drains, sewers, water, stream widening and bridge abutment. Open trenches may have to be supported by sheeting and bracing for the drains and sewers, especially when trench depth is deep and in loose sandy soils. The usual method of bracings used for Coconut Grove are portable, pre-fabricated steel plates. "Cofferdams" for the bridge supports will be needed. Where ground water is encountered, trench dewatering may be required.

Open trenches on Kailua, Wanaao and Awakea Roads will be covered during non-working hours, week-ends and during peak A.M. and P.M. traffic hours by large steel plates. One traffic lane on Kailua, Wanaao and Awakea Roads will be opened for local traffic during working hours and two lanes will be available during the peak A.M. and P.M. traffic hours, and week-ends. Access to driveways to the homes and apartments will be provided. In the urban areas, working hours will be limited to 8:00 A.M. to 3:00 P.M. Trenches for pipelines will be constructed in short increments not exceeding 150 feet. Off-duty police officers shall be hired by the contractor to direct traffic as required

by the City Department of Transportation Services.

An alternate bus route (Route 57) will be required because of the narrow streets affected. During construction on Kailua Road from Hahani Street to Wanaao-Awakea Roads, buses can be accommodated by using Kuulei Road, Kainalu Drive, Kailua Road, Aumoe Road and Wanaao Road. During the construction on Wanaao Road, the buses can use Kailua Road, Awakea Road, Auwinala Road and Wanaao Road. Bus routes will not be affected by the Hamakua Drive project. Suggested alternate bus routings are subject to the approval of the Department of Transportation Services.

The primary direct impacts of construction activities include inconveniences to the public, lowering of air quality, and higher noise levels. Air quality will be affected to some extent from exhaust fumes from construction equipment and vehicles. Dust will be generated and could affect the areas down-wind of the construction site(s). Fugitive dust will not be allowed to exceed 150 micrograms per cubic meter above up-wind concentrations (PHR 43). The construction specifications would require that the contractor control dust by watering, applying dust palliatives, or other methods acceptable to the City. The use of chemical sprays such as insecticides or herbicides is not expected.

Construction activities will have a temporary effect on water quality. Ground water from trench dewatering operation and excavation for structures will be disposed of without creating nuisances or increasing the turbidity of Kawainui and Kaelepulu Streams. Preliminary soil information indicates that the sub-surface materials are generally porous and recharging into the ground will probably be possible. In the event recharging is not possible, silting basins will probably be utilized with the overflow being discharged into the streams.

Exposed fill will be protected by compaction and grassing to minimize erosion. Excavated materials in the urban areas will probably not be stockpiled at the construction site. The contractor may be required to make arrangements to stockpile it elsewhere. In areas where sufficient open areas are available, (e.g., Hamakua alignment) the contractor will be allowed to place the materials adjacent to the trench in such a manner as to economize space and minimize interference with traffic. If necessary, such material shall be confined by suitable bulkheads or other devices. The degradation of aquatic habitats in the streams from soil erosion during construction - a secondary effect - is not anticipated.

The public will be protected from the hazards of construction

activities at all times. While working on roadways and streets, the contractor shall be required to control traffic in accordance with the "Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites On or Adjacent to Public Streets and Highways," adopted by the Highway Safety Coordinator, and the U.S. Federal Highway Administration, "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic controls for Highway Construction and Maintenance Operation," dated 1971.

When substructure excavations cross street intersection, safe crossings for vehicles and pedestrians shall be provided and maintained by the contractor. Pedestrian crossings shall be separated from vehicle crossings and shall be provided with handrails except in paved areas opened for vehicular traffic. In addition, the contractor shall locate, install, and maintain warning lights, signs, walkways and detours.

The contractor shall notify the public of the restriction of vehicular traffic and any temporary road closures in the affected area by suitable announcements in a Honolulu newspaper of general circulation and or a neighborhood newspaper.

Noise will be generated by construction activities. It will come from internal combustion engines, compressors, jackhammers, pile drivers, power saws and other construction equipment and vehicles. These noises are unavoidable, but will be limited to the daylight hours of the day (PHR 44-B). A conditional use permit for construction activities will be obtained by the contractor.

The noise level from the pile driving operation will be on the order of 101 decibels (dBA) within the Hamakua Drive R.O.W. The nearest homes are approximately 700 feet away and the resulting attenuated noise level will be around 78 dBA outside the home. Pile driving activities will probably not exceed a two-month period.

The other noise emission generated by other conventional construction equipment and vehicle will range from 79 to 88 dBA within the R.O.W. depending on the number and combination of equipment used. Homes and apartments within 50 feet from the R.O.W. will be subjected to this noise level outside of their homes or flats. Within their homes or flats, the average noise level will be about 69 to 78 dBA. The average noise level at the Kailua Intermediate School boundary will range from 71 to 80 dBA. Noise level resulting from construction activities to the outside of the nearest classrooms will range from 58 to 67 dBA. Within the class-

room these ranges will be from 48 to 57 dBA. The attenuating effects of the homes along Kailua Road was considered in estimating the noise levels for the school.

Presently, the U.S. Environmental Protection Agency is proposing to impose noise emission standards for new wheel and crawler tractors (construction equipment). Compliance with the proposed standards should reduce noise from tractors on the average of 5 dBA. This will represent an additional 10 percent reduction of construction noise added to the previous reduction mandated by existing regulations promulgated for air compressors and medium and heavy trucks used at construction sites. Overall, a reduction of 37 percent of construction noises can be anticipated by 1991.

C. Relocation

Relocation of residents abutting the R.O.W. of the proposed actions is not anticipated. The only structure which may require modification is a garage on Wanaao Road. Apartment buildings and residences have been set-back on Kailua Road in anticipation of the proposed 80-foot R.O.W. There will be no relocation of businesses or churches.

D. Social and Economic

The proposed actions will not result in any changes of life style for the neighborhoods or any ethnic groups. Neighborhoods will not be split, neither will there be any noticeable increase of cohesiveness of the community. Egress and ingress to each

affected property will continue to be allowed. Access will be improved for abutting homes, apartments and church on Kailua and Wanaao Roads. Overall aesthetics will be improved. The fear of flooding will be eliminated or diminished.

Yard areas may be reduced up to a depth of 8 feet on Wanaao and Awakea Roads. Parking for Kailua Field will not be affected by the road widening; however, the parking areas for apartments along Kailua Road may be reduced up to a depth of 16 feet based on the recommended 56-ft. R.O.W. Reduction of the GP R.O.W. will mitigate these adverse effects.

Residents of Kailua Gardens, a large apartment complex with 276 existing units (ultimate - 1200 units) on a 36-acre lot, presently have two access roads. The main access is by way of Aoloa Street off Kailua Road which is used mainly by right-turning motorists heading toward Kailua Beach or Keolu-Enchanted Lake. Motorists whose destination is downtown Kailua or Honolulu use the Hamakua Drive entrance located on Hahani Street. Widening Kailua Road would facilitate left-turn movements at the intersection with Aoloa Street.

There will be some changes in travel patterns for the affected residence. These changes are shown in the 1971, 1976-77 and 1995 traffic demand assignments. With the three GP access roads for Keolu-Enchanted Lake available, the most noticeable changes would occur on Kailua Road where there will be a reduction of 4,900 trips after Hamakua is completed. The 1995 traffic will

rise to almost what it is today (17,600 ADT); however, in the year 1995. Present traffic on Wanaao Road would be reduced about 2,200 ADT for 1977 and about 3,400 ADT by 1995. The present traffic on Keolu Drive-Kalaniana'ole Highway will be reduced by about 2,800 ADT after Hamakua is completed, and about 3,600 ADT by 1995. With the second access road from Keolu Drive loop completed, pedestrian traffic to Kailua High School will be increased from Keolu-Enchanted Lake.

Pedestrian safety on Kailua and Wanaao Roads will be improved if these roads were provided with curbs and concrete sidewalks. People will probably be less reluctant to walk to downtown Kailua if these streets were improved.

Economic impacts would occur if the sources of funding were through the improvement district ordinance. Benefited property owners or lessees would be assessed to pay for a prorated share of the project's cost. The assessment plus interest can be paid over a 20-year period or paid in full in one lump sum. The interest rate which cannot exceed 10 percent is applied against the remaining balance. The prevailing interest rate at the present time (April 1977) is 6½ percent.

Raw lands along the proposed Hamakua Drive Connection are expected to increase in value since these lands are undevelopable without the connection. Property values along Kailua and Wanaao Roads will also be increased. Most of these homes are about 25 years old and some of them can be

improved. Usually when a road or street is improved, there is an immediate interest in home remodeling and other improvements. Coconut Grove and Keolu Hills are prime examples of areas which have undergone drastic improvement in their appearance. With the increase of property values, we can expect a corresponding increase of the tax base.

E. Flood Hazard

The proposed actions will eliminate flooding on Kailua Road between Hahani Street to Wanaao Road junction during heavy rainstorms. Although the other affected urban areas are less susceptible to flooding, the installation of storm drains will ensure that flood hazard becomes extremely remote. The proposed storm drain systems that will be installed will not modify the flood hazard areas as shown on Figure IV-4.

F. Stream Modification

As mentioned in Section III. F, portions of Kawainui Stream have been improved in the past as part of the subdivision approval of abutting industrial and residential developments. The areas which are not improved or partially improved are discernible as the wide swath along the stream on the flood hazard map. Dredging of the stream to its general planned width and depth will probably continue if the abutting lands are developed or subdivided.

Prior to dredging, the existing vegetation along the banks including the mangroves will be cleared and hauled away to the Kapaa Quarry sanitary landfill. Excavation (dredging) will probably be accomplished by the use of a "dragline dredge" located on both banks of the stream. This method of dredging is less desirable than the use of a hydraulic suction dredge or clamshell dredge. The latter two methods are accomplished from a barge. In order to control silting of the downstream improved portion, movable silt curtains may be installed as a precautionary measure. If possible, dredging will be scheduled during the non-rainy months. Dredged material may be used as fill material for the side slopes and embankment depending on the analysis of the stream sediments. Since the invert (bottom) and side slopes will not be lined (with concrete or riprap), vegetation will be restored rapidly on the stream banks. Mangroves will be restored later.

None of the native and exotic species of fishes in Kawainui Stream are endangered. During the dredging operation they are expected to migrate outside the turbid zones and not be adversely affected. On the other hand, benthic organisms in the stream, the Samoan and "blue pinch" crabs will probably be destroyed.

Part of the stream improvements will involve the raising of the ground elevation of the stream embankment to contain

storm flows. The elevated banks on the mauka (south) side will effectively block the interchange of stream water which exhibits estuarine qualities, onto the low-lying marsh.

G. Wetlands

The area of the present Kaelepulu marsh is about 35 acres. Ground elevation ranges from 1.5 feet to 15 feet on the lower slope of Puu O Ehu. The ridge rises to an elevation of 315 feet. The marsh is in the Urban District on the State Land Use Map (0-14) as shown in Figure III-4. The land uses of the area are designated industrial and residential in the DLUM (Figure IV-3). The marsh is within the proposed flood hazard district as well as the special management area (Ordinance No. 4529).

Construction of the Hamakua Drive connection with a R.O.W. of 70 feet would alter an area of about 2 acres (roadway and embankment) of the marsh. Widening for the improvement of Kawainui Stream would affect another 3 acres for a total of about 5 acres, leaving a balance of about 30 acres of marshland. These figures are gross estimates.

Since endangered species of endemic birds are found in the marsh adjacent to the proposed roadway, the State Fish and Game Division has suggested the possibility of providing additional habitat for the endangered species in conjunction

with the road project. As suggested, the planning of design and construction will be coordinated with the Fish and Game Division.

If residential and industrial developments are initiated after the completion of the Hamakua connection, we will witness the demise of yet another marsh on Oahu. Mitigative action such as Federal or State acquisition of the marsh seems improbable at this time. The alternative of downing the marsh to State Land Use Conservation or CZM Preservation has been suggested. Downzoning will be supported by the State Fish and Game Division and the Federal Fish and Wildlife Services. The affected area is shown on Figure IV-1.

The transformation of the marsh into urban development would result in additional municipal services. We can anticipate an additional 150 housing units if urbanization were to occur. Municipal services including liquid and solid wastes disposal can be considered adequate and available at this time to serve the proposed development. Water services cannot be assured in the future without development plans being firm. Additional traffic will be generated. The peak hour traffic demand will be increased by about 70 trips on the main traffic arterials from Kailua to Honolulu.

The tax base will be increased upon urbanization. Revenue will be increased from property taxes and the water and sewer charges to offset the cost of providing additional municipal services.

H. Water Quality

The Kaelepulu watershed has undergone drastic changes. The major changes include the reduction of Kaelepulu pond from 216 acres to 125 acres by filling; the diversion of Maunawili Valley flows to Oneawa Channel; and the on-going program for channel improvement. The first two major changes have been completed and can be considered final. Kaelepulu pond is classified conservation on the State Land Use Map and in all probability will not be filled further.

The construction of the earth levee mauka of Coconut Grove in 1964 prevents fresh water from Kawainui marsh from flowing into Kawainui Stream. This action, over the short period of time (13 years), has affected the water quality of the stream. The levee also affects water quality in a beneficial way by diverting the effluent from the Kukunono and Pohapuhu wastewater treatment plants into the marsh and Oneawa Channel. (Discharges will be eliminated later.)

The waters in Kawainui Stream are replenished by storm run-off and ground water flows from Coconut Grove. All of Coconut Grove except for a small pocket was recently provided with municipal sewers. However, old cesspool wastes in the ground water will continue to influence water quality in the stream for some years. The same, to a lesser degree, may also be true for Kaelepulu Pond since Enchanted Lake was once served by individual household cesspools.

With its outlet blocked at Kailua Beach Park, Kaelepulu and Kawainui are non-flowing streams or sluggish streams at the most. Dissolved oxygen is maintained by reaeration and photosynthesis by plankton and algae. The plankton and algae in turn serve as food for fishes, other aquatic organisms and water birds including the Hawaiian Gallinule, Hawaiian Coot, Hawaiian Stilt and the Hawaiian Duck, all endangered species.

Water quality data were obtained from five (5) stations located between Kailua Road bridge and Kailua Beach Park. The location of the stations is shown in Figure V-1 and are as follows.

Station 1 - Kawainui Stream at Kailua Road bridge.

Station 2 - Kawainui Stream at proposed Hamakua bridge.

Station 3 - Kawainui Stream at Wanaao Road bridge.

Station 4 - Kaelepulu Stream at Kawaihoa Road bridge.

Station 5 - Surf Zone off Kailua Beach Park.

Grab water samples were taken on April 25, 1977 and May 23, 1977 during the morning hours. The April 1977 analysis were limited to four parameters, and are of marginal benefit.

The May analysis were expanded to ten (10) parameters when it became apparent that there may be water quality problems in the affected streams. The dissolved oxygen (DO) concentration on April 25 were noticeably depressed at Stations 1, 2 and 3 with values of 1.6, 2.4 and 4.4 milligram per liter (mg/l), respectively. All these values are below

the DO standards of 5.0 mg/l for Class 2 waters (PHR-37-A). The results of the May 23 analysis from DO for Stations 1, 2, and 3 were in the same order of magnitude with the previous analysis.

Biochemical oxygen demand (BOD) were significant at Stations 1, 2 and 3 indicating that active decomposition of organic material was occurring. Since there are no known discharge of waste material into the stream, the probable causes are animal wastes from the adjoining marsh, decaying vegetation within the stream, and residual percolates from abandoned cesspools in Coconut Grove. Results of the May 1977 analysis are shown in Table V-1.

Total nitrogen and total phosphorus values indicate that Kawainui Stream is undergoing eutrophication. The lush vegetation on the stream banks attest to this condition. The mixohaline characteristics of the stream's waters are indicated by the total dissolved solids concentrations which ranged from 3,100 mg/l at the Kailua Road bridge to 28,000 mg/l at Kailua Beach Park.

The fecal coliform to fecal streptococci ratios (FC:FS) have been used in the past and present as a method for determining whether the sources of bacterial pollution are of human origin or animal origin. The FC:FS ratios, as determined by Geldreich and Kenner (1969), are 4.4 or

greater for humans, and less than 0.7 for non-human warm-blooded animals. Applying these ratios as guidelines, it appears that the sources of bacterial pollution in Kawainui Stream are from non-human warm-blooded animals. The FC:FS ratio at the Kaelepulu Stream mouth and the surf area at Kailua Beach Park seems to indicate that man is the source of bacterial pollution in these areas. These areas are intensely used by bathers and bathers are known to be contributors of fecal coliform bacteria.

A sediment sample from Kawainui Stream was obtained at Station 2 (Hamakua bridge crossing) to determine the concentrations of chlorinated hydrocarbon pesticides and heavy metals. The pesticides analyzed included lindane, chlordane, DDD, DDT, PCB, PCP and Dieldrin. The heavy metals included aluminum, cadmium, chromium, copper, iron, lead, mercury, nickel and zinc. Results of the analysis are shown in Table V-2.

Sediment samples, taken during 1973 at the Kailua sewer outfall and the new Mokapu outfall in Kailua Bay were analyzed for pesticides and heavy metals. DDT was found at the three stations and ranged from 140 to 215 parts per trillion (ppt). What is surprising about the Kawainui Stream sample is that the DDT concentration of 15.162 ppt is less by an order of 10 than the bay samples. However, the other pesticides were of a greater magnitude than the bay sediments since other pesticides were not detected in the bay.

Levels of pesticides in sediments were found in Maunalua Bay by Lau, et al, (1973) and Kaneohe Bay (Lau, et al, 1976). The higher mean concentrations in nanogram per kilogram (ng/kg), found in both sampled areas, were chlordane α , 20,528; chlordane γ , 16,108; dieldrin, 2,391; DDE, 163; DDD, 22; DDT, 3,532; lindane - not detectable; and PCP, 6,616. (Note: 1 ng/kg is equal to 1 ppt). Levels of pesticides in the Kawainui Stream samples do not appear out of the ordinary considering levels found in bay sediments on Oahu.

The levels of heavy metals found in the Kawainui Stream sediment appear high for chromium, lead, aluminum and iron. Aluminum and iron are found in great abundance in Hawaiian soils but not in the magnitude reported. The ranges of values for chromium and lead for Kaneohe Bay (Lau, et al, 1976) and Kailua Bay samples were 16-192 mg/kg and 5-37 mg/kg, and 7-131 mg/kg and 20-31 mg/kg, respectively, compared to 1,000 mg/kg and 362 mg/kg found in the Kawainui Stream sediment. Since Station 2 is close to the industrial park on Hamakua Drive, it is possible that there may be surreptitious dumping of heavy metal compounds by repair shops into the streams. There are no logical explanation.

Long term water quality of the stream will not be adversely affected by further improvements of the stream. Water volume will be increased. Mangroves and other vegetation

will be re-established on the banks since the invert and the banks will not be lined with concrete. Water temperature will be maintained or be slightly higher. Benthic organisms will be destroyed by dredging; however, they will be re-established after a period of time. There are no endangered species of fishes and flora in the stream.

The secondary effects of urbanization of the marsh would probably result in some changes in the water quality of Kawainui Stream. Biochemical oxygen demand can be expected to decrease due to the elimination of animal wastes into the stream. The dissolved oxygen concentration will probably increased. On the other hand, urban runoff will increase with its attendant pollutants including suspended solids, trace metals, nutrients and petrochemical wastes.

TABLE V-1

Water Quality Data
Kawainui - Kaelepulu Stream
(Data from Division of Sewers, May 1977)

Parameters	Units	S t a t i o n s				
		1	2	3	4	5
Biochemical Oxygen Demand	mg/l	5.5	3.1	1.9	0.3	1.7
Chemical Oxygen Demand	mg/l	108	72	43	230	122
Dissolved Oxygen	mg/l	1.1	2.8	5.0	7.0	7.0
pH	Unit	7.48	7.54	7.86	7.96	8.01
Suspended Solids	mg/l	18	12	30	26	72
Total Dissolved Solids	mg/l	3,108	6,468	13,988	28,120	28,612
Total Nitrogen	mg/l	3.91	3.11	3.43	2.01	2.01
Total Phosphorus	mg/l	0.549	0.497	0.390	0.227	0.105
Fecal Coliform	#/100 ml	< 2	86	64	58	60
Fecal Streptococci	#/100 ml	650	120	180	< 10	< 10
FC:FS Ratio	-	0.00:1	0.72:1	0.35:1	5.8:1	6.0:1

WATER QUALITY STANDARDS - CLASS 2 WATERS
PHRS, CHAPTER 37-A

Parameters	Units	Requirements
Dissolved Oxygen	mg/l	Not less than 5.0
pH	unit	Not less than 6.5 or higher than 8.5
Total Phosphorus	mg/l	Not greater than 0.20
Fecal Coliform	#/100ml	Shall not exceed the average of 200 10% of samples shall not exceed 400

0

0

h

TABLE V-2

Pesticides and Heavy Metals Analysis
 Hamakua Bridge Crossing at Kawainui Stream
 (Data from Division of Sewers, May 1977)

Pesticides	Concentration (ppt) ¹	Heavy Metals	Concentration mg/kg ²
Lindane	1.007	Aluminum	28,150
Chlordane	4.987	Cadmium	6.3
DDD	34.456	Chromium	1,000.9
DDT	15.162	Copper	218.1
PCB	244.725	Iron	103,215
PCP	-	Lead	362.2
Dieldrin	-	Mercury	0.1297
		Nickel	112.6
		Zinc	29.9

1. Parts per trillion.
2. Milligram per kilogram.



I. Natural Ecological System

In the urban areas, we can expect the destruction of some matured trees and hedges based on the recommended alternative. If the R.O.W. for Kailua Road is reduced from 80 to 56 feet, the possibility of saving the ironwood trees is greatly enhanced. Reducing the GP R.O.W. for Wanaao Road from 60 to 56 feet will place some of the existing trees within the sidewalk area, hence these trees might be spared. Hedges, however, will probably be destroyed if they are located within the selected R.O.W. of the road widening projects.

Matured trees provide shade and comfort for the residents and provide habitat for exotic birds. Matured hedges also provide privacy and have ornamental values for the resident's home. Both trees and plants greatly enhance the aesthetic quality of the urban areas. Many of the dominant species of flora in the affected urban area are relatively slow-growing and replacement and growth to their present condition would take many years. These flora include the ironwood, coconut palm, and mock orange.

Vegetation and mangroves along Kawainui Stream which will be removed during the widening of the stream provide shade and cover for exotic and native fishes. Without shade, variation of water temperature in the stream will be more pronounced and could affect larval forms of fish or juvenile

fish. Fishes, being mobile, will migrate to other areas but will return when the exposed area reverts to its former state.

Dredging of the stream will alter the bottom covers for fishes. Periphyton, the slimy coating of attached algae on objects submerged in water will be displaced or removed.

Bottom fauna or benthos consisting of invertebrate animals-insects, crustaceans, and aquatic earthworms will be displaced and removed. Algae and benthos provide a large part of the food for fishes and the endangered native water birds.

The gallinule and stilt nest on the margin or close to the stream or marsh. Food for the gallinule includes algae, aquatic insects and mollusc. The stilt feeds on crustaceans and water insects.

The Koloa ducks nest on the ground near water and can breed the year round. The coots, on the other hand, nest in the reeds or by the edge of the stream. Foods for the ducks consist of algae, earthworms, snails and grass seeds. The coots are excellent divers and gather foods consisting of vegetable matters from the bottom of the streams.

The native water birds will be affected by the proposed Hamakua Drive connection and the stream improvements.

Permanent adverse effects may be minimized according to the State Fish and Game Division by careful planning, design and construction. To this end, the projects will be coordinated with the State.

The population of exotic birds in Kaelepulu marsh will not be measurably affected by the proposed projects since they are more adeptive than endemic birds. Removal of brushes and ground cover will affect them temporarily.

The destruction of nest sites for the exotic mammal in the marsh will have a beneficial effect since they are predatory animals. The gallinules are especially vulnerable to predation by the mongooses. Finally, the bridge will allow the movement of exotic mammals to both sides of the stream. The impact of this movement is not known.



J. Noise

Impact of traffic on noise levels were analyzed for various alternatives of the road projects for the 1977 and 1995-years design period using the traffic assignment data prepared by the City's Department of Transportation Services (DTS). Noise levels were finally evaluated between the alternative of no action and the recommended alternative of improving Hamakua Drive to the 70-foot ROW, and widening both Kailua and Wanaao Roads to 56-foot ROW's.

Observer categories included residences, school, and church along Wanaao and Kailua Roads. Kailua Intermediate School off Kainalu Drive was included because any improvement on Kailua Road may effect noise level within the school's classroom located approximately 400 feet from the existing Kailua Road center-line. PHR 44B requires that highway noises be limited to 50 decibel (dBA), "A" scale, inside any school classroom, library, multi-purpose room, hospital, or rest home already in existence. Whenever, the 50 dBA standard is exceeded, remedial measures will be applied. These remedial measures include sound-proofing, barrier walls, acoustic windows, etc. The cumulative average reading of ambient noise level (L50) from 34 stations is 45 dBA for Kailua (Miyake, 1974). However, extreme levels ranged from 30 to 94 dBA.

According to DTS traffic data, traffic demands will be increased from the present count of 18,429 ADT to 28,400 ADT in the 1995 design year on Kailua Road without the Hamakua Drive connection. Traffic on Wanaao Road will be increased from 11,340 ADT to 13,400 ADT during the design period. Hence, we can expect noise levels from traffic to be increased on the basis of traffic demands alone on Kailua and Wanaao Roads. The same is true for Keolu-Kalaniana'ole where traffic demand will be expected to increase by almost 2,700 ADT. The increases in ADTs on Keolu-Kalaniana'ole and Wanaao are not as substantial as the increase on Kailua Road. Widening Kailua and Wanaao Roads without the Hamakua connection will increase the noise level at the affected properties by 1 or 2 dB since the traffic will be closer to the receptors. Another factor is the lack of truck traffic on Kailua and Wanaao Roads. Buses are the only heavy duty vehicles which regularly use these roads. Even with improvements, heavy truck traffic will probably not increase measurably beyond the present level on Kailua Road and Hamakua Drive. A conservation estimate of 5 percent truck traffic was used in the noise analysis except for Wanaao Road where 3 percent was used.

Projected noise levels were calculated for the average level (L50) and the maximum level (L10) during the peak traffic hour which occurs on all the affected roads during the afternoon rush hours. Typical homes on the affected streets



were selected at random and their distances to the center-line of the roadway were determined. Three other receivers were selected on Kailua Road.

All of the abutting properties to the proposed improvements are affected to some degree by traffic noises. The values calculated, as shown in Table V-3 , represent the worst average (L₅₀) and peak (L₁₀) conditions during any 1-hour period of the day which occur during the hours of 4 to 6 p.m. during a regular work day. The L₅₀ and L₁₀ noise levels were calculated for comparative reasons using the methodology in the National Cooperative Highway Research Program (NCHRP) Report 117. The NCHRP format follows the methodology recommended by the Federal Highway Administration (FHWA) of the U. S. Department of Transportation. The FHWA recommends that the L₁₀ noise levels from federal highway systems should not exceed 70 dBA where the abutting land uses include residence, schools, churches, etc.

Another criteria that is used to evaluate the acceptability of noise levels is the Department of Housing and Urban Development's (HUD) External Noise Exposure Standards. HUD classifies an area as discretionary - normally unacceptable if the noise level exceeds 65 dBA for more than 8 hours per 24 hours. Areas are classified discretionary - normally acceptable if the noise level exceeds 65 dBA for less than 8 hours per 24 hours.

The impact of noise levels generated by traffic will become less severe with the implementation of the Hamakua improvements. Typically, there will be reductions of 1 to 4 dB and 2 to 5 dB for the L₅₀ levels for the years 1977 and 1995. The 1995 noise levels were calculated on the basis of no reduction of noise levels from improved automobiles in the future. If reduction of automobile noise by manufacturers were taken into account, a 6 to 9 dB reduction can be expected in 1990, with the replacement of existing noisy vehicles. The L₁₀ noise levels are expected to be reduced with the recommended road improvements from 1 to 4 dB for the year 1977 and 3 to 4 dB for the year 1995.

When the FHWA criterion of L₁₀ = 70 dBA is used to evaluate the calculated noise levels, none of the receptors except Kailua Intermediate School can meet the criterion without or with the recommended improvements. The FHWA criterion is too restrictive and unrealistic in terms of actual effects on the human environment. The HUD criterion is considered more realistic (Miyake, 1977).

When the HUD criterion of discretionary-normally acceptable if the noise level exceeds 65 dBA for less than 8 hours per 24 hours is used, we find after improvements that all of the receptors except the apartment building on Kailua Road and Aoloa Street can meet this requirement. During the hours between 10 p.m. to 6 a.m., it was found that the above receptors

also met the 55 dBA guideline for night-time sleep period. The L50 level for the apartment building on Kailua Road and Aoloa Street met this night-time guideline, except for the hours between 10-11 p.m., when the guideline was exceeded by 1.5 dB.

For the Kailua Intermediate classrooms closest to Kailua Road, the outside L50 noise levels ranged from 52 to 56 dBA without improvements and 49 to 52 dBA with improvements for the years 1977 and 1995, respectively. Inside the classrooms, the noise levels will be about 10 dB less.

The L50 noise levels meet the DOH requirements of 50 dBA within the classrooms. The L10 noise levels, however, do not meet the requirement by 2 to 6 dB without improvements and 2 dB with improvements for the 1995 design year.

It must be remembered that the L50 and L10 noise levels shown would occur between the hours between 4 to 6 p.m. when school will be closed.

The noise impact on peoples' reaction varies since noise is subjective. The most commonly cited complaints regarding "loud noises" are related to interferences with sleep, speech communication, reading and TV viewing, and rest and recreation. If noise levels are raised by 5 dB slowly over a prolonged period of time, people will not likely notice the change. People will certainly notice the 5 to 10 dB

TABLE V-3

IMPACT OF TRAFFIC ON NOISE LEVEL ON
 SELECTED RECEPTORS WITH AND WITHOUT IMPROVEMENTS
 (Values in dBA)

Location Receptor	WITHOUT IMPROVEMENTS				WITH RECOMM. IMPRMTS.			
	L50		L10		L50		L10	
	1977	1995	1977	1995	1977	1995	1977	1995
Hamakua Dr. Home ¹	-	-	-	-	63	67	73	77
Keolu-Kalaniana'ole Hwy. Typical Home ²	69	70	83	85	67	68	82	82
Kailua Road Apartment ³	70	75	80	86	69	72	78	82
Church ⁴	66	71	76	81	64	67	74	77
Home ⁵	67	71	72	76	63	66	70	72
School ⁶	52	56	62	66	49	52	58	62
Wanaao Rd. Home ⁷	65	67	75	77	64	64	73	73

1. Typical home, 50 feet from proposed ROW boundary.
2. Typical home, 50 feet from proposed ROW boundary.
3. Apartment on Kailua Road and Aoloa Street.
4. Mormon Church on Kailua Road.
5. Typical home, 88 feet from proposed ROW boundary.
6. Kailua Intermediate School on Kainalu Drive.
7. Typical home, 22 feet from proposed ROW boundary.



increase of the L10 levels over the L50 levels during the peak traffic hour for some of the receptors of the affected areas.

K. Air Quality

Air quality was evaluated and analyzed for the "no action" and recommended alternatives of a 70-foot wide Hamakua connection and a 56-foot widening of Kailua and Wanaao Roads. The effects of widening Hamakua Drive to 80 feet between Kailua Road and Hekili Street were also evaluated. EPA (1975) Series on "Guidelines For Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources" was used in the evaluation. The methods employed by the guidelines provide for a screening procedure for estimating peak carbon monoxide (CO) concentration, the results of which are intended to be conservative.

The major assumptions of the guidelines are:

1. A steady wind speed of 1 m/sec;
2. Wind direction making an angle of 10° with the roadway for free-flow traffic conditions;
3. Several wind directions for non-free flow traffic conditions;
4. Pasquill-Gifford Stability Class D;
5. A persistence factor of 0.6 in estimating 8-hour CO concentration;
6. Ambient temperature of 68°F - 86°F ;
7. Known G/cy ratio used at intersection or assumed at 0.6;
8. Traffic mix composed of 88 percent automobiles and 12 percent light-duty trucks; and

9. Correction factor reflecting emission control program, 1977 - 0.8, 1995 - 0.4.

The primary auto-related air pollutants are carbon monoxide (CO), nitrogen oxides (NO_x) and hydrocarbons (HC). Attempts to control auto-related air pollutants have been on the national scale by requiring automobile manufactures to produce "cleaner" cars. The Clean Air Act Amendments of 1970 set the following statutory emission standards for new automobile models.

<u>Model Year</u>	(Values in grams per mile)		
	<u>HC</u>	<u>CO</u>	<u>NO_x</u>
1974	3.0	28.0	3.1
1975	1.5	15.0	3.1
1977	1.5	15.0	2.0
1978	.41	3.4	.4

The recent Clean Air Act Amendment of 1977 includes provisions which provide among other things for a two-year extension on the current standards for new model automobiles, and the reclassification of areas which are cleaner than the national ambient air quality standards into three designations. Allowable pollutant levels will be designated later by regulations for each of the three classes. The new automobile emission standards are as follow:

<u>Model Year</u>	<u>(Values in grams per mile)</u>		
	<u>HC</u>	<u>CO</u>	<u>NO_x</u>
1978-1979	1.5	15.0	2.0
1980	.41	7.0	2.0
1981	.41	3.4	1.0

The new standards contain a loophole provision which permits EPA to waive the 3.4 CO requirements up to 7.0 upon findings that control technology is not available as determined by cost, fuel economy and other factors.

Air quality evaluation for the proposed road projects would require only a micro-analysis based on the guidelines:

<u>Conditions</u>	<u>Criteria for Micro-Analysis</u>
Construction of new highway	
Hamakua Drive	Anticipated ADT 14,800 < <u>20,000</u>
Modification of existing highway	
Hamakua Drive	Anticipated ADT increase 4,000 < <u>10,000</u>
Kailua Road (w/o Hamakua)	Anticipated ADT increase 10,000 = <u>10,000</u>
(w/Hamakua)	Anticipated ADT decrease 10,000
Wanaao Road (w/o Hamakua)	Anticipated ADT increase 2,000 < <u>10,000</u>
(w/Hamakua)	Anticipated ADT decrease 3,000

Based on the guidelines and the results of the evaluation, a more comprehensive analysis such as "HIWAY" was not performed.

Ambient air quality characteristics have been routinely monitored by the State Department of Health throughout the State since 1971. Six of the ten monitoring stations are located on Oahu, two on Maui, and one each on Hawaii and Kauai. The Oahu stations are located at the Department of Health's Kinau Hale on Punchbowl Street, Barbers Point, Pearl City, Kalihi-Kai, Ala Moana and Waimanalo. Air quality data collected include particulate matter, sulfur oxide and nitrogen dioxide.

Carbon monoxide and photochemical oxidants are collected only at the Punchbowl station. Particulate matter is the only pollutant monitored at the Waimanalo station.

Ambient air quality data for CO are not available for Windward Oahu as of this date (November 1977). Carbon monoxide is continuously sampled only at Kinau Hale at the Punchbowl station. The Department of Health is presently gathering baseline CO data from selected sites in Honolulu and rural Oahu. Starting in June 1977, two monitoring stations located along Castle Hospital and Kailua Elementary School were placed in operation. The monitoring program includes 16 - 1-hour samples taken every fourth day. Related meteorology and traffic counts are also being collected. Results of the monitoring program will not be available until 1978.

The National Ambient Air Quality Standards (NAAQS) for CO concentration is 40 microgram per cubic meter (mg/m^3) or 35 parts per million (ppm), maximum average in any 1 hour; and 10 mg/m^3 or 9 ppm, maximum average in any 8 hours. The corresponding State AAQS is substantially more stringent and calls for 10 mg/m^3 or 9 ppm, maximum in any 1 hour; and 5 mg/m^3 or 4 ppm, maximum in any 8 hours.

Using EPA guidelines, CO concentrations were calculated for selected receptors along Hamakua Drive, Keolu-Kalaniana'ole,

Kailua Road, and Wanaao Road. CO concentrations were found under the "no action" and recommended alternatives and are shown in Tables V-4 and V-5.

Where applicable, CO concentrations were determined under free-flow traffic conditions and/or non-free-flow conditions such as at intersections. Due to traffic congestions and two nearby signalized intersections, CO concentrations on Kailua Road were based under non-free-flow conditions. The results indicated that there will be a slight reduction of less than 1 ppm of the CO concentrations on Keolu-Kalaniana'ole after the Hamakua connection is completed. The reductions of CO values were larger on Wanaao with improvements ranging from 2.2 ppm to 0.4 ppm. The greatest improvement in air quality would occur on Kailua Road after the Hamakua improvements. The apartment building on Kailua Road and Aoloa Street would receive the most benefit with a CO reduction of 5.5 ppm for the year 1995.

The calculations showed, based on the recommended improvements, that all of the receptors with the exception of the apartment house on Kailua Road will meet the present air quality standards on CO. The 1-hour CO concentration at the apartment house would exceed the State standard by 2 ppm. Since the calculated values employed by the guidelines are intended to be conservative, it is possible that actual CO concentration at the apartment house will be below the State standards.

As stated earlier, the guidelines for determining peak CO concentrations were based on meteorological conditions which minimize the phenomena of natural diffusion of the air pollutant. These conditions included a wind direction angle of 10 degrees with the roadway, a wind speed of 1 meter per second and Class D Pasquill-Gifford atmospheric stability class. Based on limited wind direction and velocity data from the Kaneohe Marine Corps Air Station (Bathen 1972) occurrence percentages were determined for each 10 degree segments for 6 groupings of velocities as shown in Table V-6.

The critical directions were determined for each of the proposed road improvements. Hamakua and Wanaao Road were each divided into two segments because of their circuitous alignments. The critical directions were as follow:

Hamakua Drive, Kailua Road to Hekili Street	100° - 150°
Hamakua Drive, Hahani Street to Akoakoa Street	110° - 160°
Kailua Road, Hahani Street to Wanaao Road	100° - 120°
Wanaao Road, Kailua Road to Kakahiaka Street	90° - 110°
Wanaao Road, Kakahiaka Street to Auwina Street	160° - 180°
Keolu Drive-Kalaniana'ole	50° - 70°

From Table V-6, the potential number of days in the year when the wind will be blowing within the critical directions were determined for each of the existing or proposed road segments. The potential number of days when the velocities of the critical winds were below 2 meter per second or less

were determined. Disregarding atmospheric stability for this evaluation, the number of days when we can expect the worst possible CO concentration were determined. The results of this evaluation are shown below:

Location	Critical Winds Directions (days/year)	Critical Wind Direction Wind Velocity less than 2m/s (days/year)
Hamakua Drive		
Kailua Rd. to Hekili	11	2
Hahani to Akoakoa	16	6
Kailua Road		
Hahani to Wanaao	4	2
Wanaao Road		
Kailua Rd to Kakahiaka St.	28	5
Kakahiaka to Auwina St.	23	12
Keolu Drive		
Kalaniana'ole-Akaakaawa St.	75	4

Based on wind direction and wind velocity (2m/s or less) only, the potential number of days when the highest CO concentration can be expected along the existing and proposed access roads into Keolu-Enchanted Lake were found. Because of favorable wind conditions in Windward Oahu, air quality in Kailua is not expected to become a severe problem even though the analysis as shown in Table V-4 and V-5, indicate that CO concentrations will approach and occasionally exceed the State AAQS. (Note. The above evaluation does not consider the atmospheric stability and specific peak hour winds which normally would have been used, if available in computerized dispersion models.)



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TABLE V-4

IMPACT OF TRAFFIC ON CARBON MONOXIDE (CO) CONCENTRATION¹
ON SELECTED RECEPTORS WITHOUT IMPROVEMENTS
(VALUES IN PPM)

LOCATION RECEPTOR	FREE FLOW TRAFFIC				NON-FREE FLOW TRAFFIC			
	1-HR. CONC.		8-HR. CONC.		1-HR. CONC.		8-HR CONC.	
	1977	1995	1977	1995	1977	1995	1977	1995
Keolu-Kalaniana'ole Typical Home	3.2	1.9	1.3	0.8	6.3	3.7	2.7	1.8
Kailua Road Apartment ²	-	-	-	-	14.6	13.3	6.6	6.3
Church	-	-	-	-	8.0	7.4	3.7	3.6
Typical Home	-	-	-	-	8.6	6.6	4.3	3.3
Playground	-	-	-	-	7.1	5.4	3.5	2.7
School	-	-	-	-	3.4	2.6	1.7	1.3
Wanaao Road Typical Home	4.9	3.9	1.7	1.1	7.2	5.0	2.9	1.9

1. Corrected values based on present and future emission controls.

2. Apartment on Kailua Road and Aolua Street.

Note: Values given do not include ambient CO concentration.

TABLE V-5

IMPACT OF TRAFFIC, ON CARBON MONOXIDE (CO)
 CONCENTRATION¹ ON SELECTED RECEPTORS WITH IMPROVEMENTS
 (VALUES IN PPM)

LOCATION RECEPTOR	FREE FLOW TRAFFIC				NON-FREE FLOW TRAFFIC			
	1-HR. CONC.		8-HR. CONC.		1-HR. CONC.		8-HR. CONC.	
	1977	1995	1977	1995	1977	1995	1977	1995
Hamakua Drive Typical Home	2.5	1.8	2.0	1.4	-	-	-	-
Typical Business	-	-	-	-	8.0	7.5	3.0	4.6
Keolu-Kalaniana'ole Typical Home	2.6	1.5	1.1	0.6	5.5	3.2	2.2	1.4
Kailua Road Apartment ²	-	-	-	-	11.0	7.8	4.7	3.1
Church	-	-	-	-	5.8	4.2	2.6	1.7
Typical Home	-	-	-	-	6.2	3.9	2.6	2.1
Playground	-	-	-	-	5.0	3.2	2.1	1.7
School	-	-	-	-	2.5	1.6	1.0	0.8
Wanaao Road Typical Home	3.0	1.8	1.3	0.7	5.0	3.0	2.4	1.3

1. Corrected values based on present and future emission controls.

2. Apartment on Kailua Road and A'oloa Street.

Note: Values given do not include ambient CO concentration.



TABLE V-6
WIND DIRECTION AND VELOCITY OCCURRENCE¹
KAILUA, KOOLAUPOKO, OAHU
(September 1971 to June 1972)²

DIRECTION (Degree)	OCCUR- RENCE %	VELOCITY (KNOTS) ³ No. of Occurrence					
		0	1-4	5-8	9-12	13-16	17+
0	11.15	32	27	27	13	3	-
10	10.27	53	5	13	18	3	2
20	7.98	2	6	26	32	6	1
30	.77	3	2	2	-	-	-
40	22.95	7	14	49	73	53	14
50	0.33	2	-	-	1	-	-
60	0.33	3	-	-	-	-	-
70	20.22	5	12	31	65	63	9
80	1.53	14	-	-	-	-	-
90	6.56	6	3	18	20	11	2
100	-	-	-	-	-	-	-
110	0.98	-	3	4	2	-	-
120	0.11	-	1	-	-	-	-
130	1.86	-	2	9	6	-	-
140	-	-	-	-	-	-	-
150	-	-	-	-	-	-	-
160	1.42	-	9	1	2	1	-
170	0.11	-	1	-	-	-	-
180	4.81	-	21	9	5	5	4

DIRECTION (Degree)	OCCUR- RENCE %	VELOCITY (KNOTS) ³ No. of Occurrence					
		0	1-4	5-8	9-12	12-16	17+
190	-	-	-	-	-	-	-
200	1.64	1	9	3	1	-	1
210	0.33	-	1	2	-	-	-
220	2.19	-	12	3	3	2	-
230	-	-	-	-	-	-	-
240	-	-	-	-	-	-	-
250	0.33	-	2	1	-	-	-
260	0.33	-	1	2	-	-	-
270	1.42	-	9	3	-	-	1
280	-	-	-	-	-	-	-
290	0.44	-	1	3	-	-	-
300	-	-	-	-	-	-	-
310	0.87	-	-	3	3	2	-
320	-	-	-	-	-	-	-
330	-	-	-	-	-	-	-
340	0.98	-	2	6	-	1	-
350	0.11	-	-	-	1	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

NOTE:
1. DATA FROM KANEHOE MARINE CORP. AIR STATION, FROM BATHAN (1972).
2. A TOTAL OF 915 OBSERVATIONS TAKEN AT 0, 800, and 1600 HOURS.
3. A KNOT IS EQUAL TO 1.15 MPH OR 0.51 METER PER SECOND

VI. ALTERNATIVES TO THE PROPOSED ACTIONS

Several alternatives were considered in the evaluation of the proposed actions. These alternatives were evaluated in terms of traffic capacity, improvement cost, safety, convenience, aesthetic and environmental effects in the EIS. Alternatives were grouped into seven (7) major categories. They included the following:

1. Do Nothing Alternative
2. Road Width Alternative
3. Alignment Alternative
4. Bridge Structure Alternative
5. Road Improvement Alternative
6. Upgrading Existing Roads Alternative
7. Mass Transit Alternative.

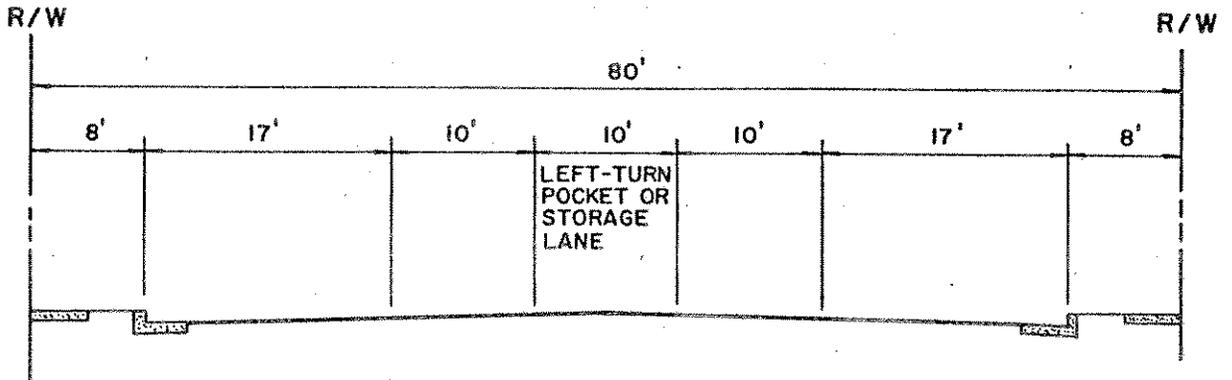
A. Do Nothing Alternative

Under the "do nothing alternative," Hamakua Drive will not be extended. The existing segments will be "dead-ended" at Hahani Street in the Kailua industrial area and Akoakoa Street in Enchanted Lake. Kailua Road between Hahani Street to Wanaao Road, and Wanaao Road between Kailua Road to Auwina Street will remain two-laned roads within their existing 40-foot right-of-way (R.O.W.). Under this alternative, the existing traffic system and poor roadway conditions will remain as they are and traffic congestion

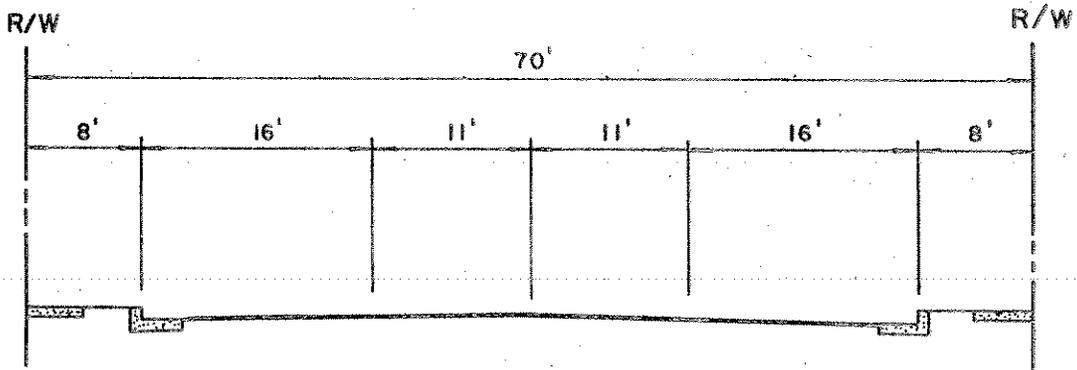
will get worse in the future. In terms of improvement cost, this will be the most economical alternative and will not require the expenditure of any public funds. In terms of traffic capacity, safety, and convenience, this alternative appears to be the least desirable.

Under the "do nothing" alternative, traffic demand (ADT) from 1975-1977 to 1995 will increase from 18,400 trips to 28,400 trips on Kailua Road, 11,100 trips to 13,400 trips on Wanaao Road, and 14,800 trips to 17,500 trips on the Keolu Drive connection to Kalaniana'ole Highway. The present capacity of the two-laned Kailua Road during the peak afternoon hours has been reached and traffic conditions in 1995 would become intolerable if something is not done to improve the existing and proposed access roads. Consequently, the "no action" alternative was not selected for the Kailua Road, Wanaao Road and Hamakua Drive projects.

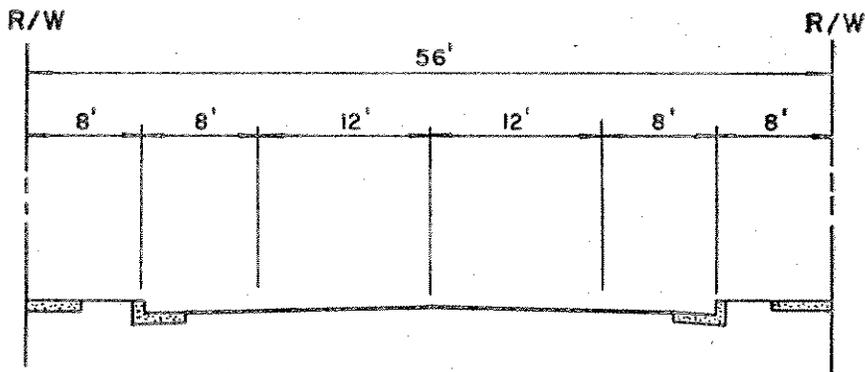
The "do nothing" alternative, however, was applied to the general planned connection of Ulumanu Drive to Keolu Drive loop via Kailua High School and Akiohala Street. This alternative was selected because of the low traffic demand, and the resulting adverse environmental effects on the school's operation and the Pohakupu community. Since Kailua High School now has a second access road from Keolu-Enchanted Lake, the need for the connection is somewhat moot. The second access road would satisfy the circulation requirements around



80' RIGHT - OF - WAY ALTERNATIVE
 (NOTE: 64 FT., CURB TO CURB)



70' RIGHT - OF - WAY ALTERNATIVE
 (NOTE: 54 FT., CURB TO CURB)



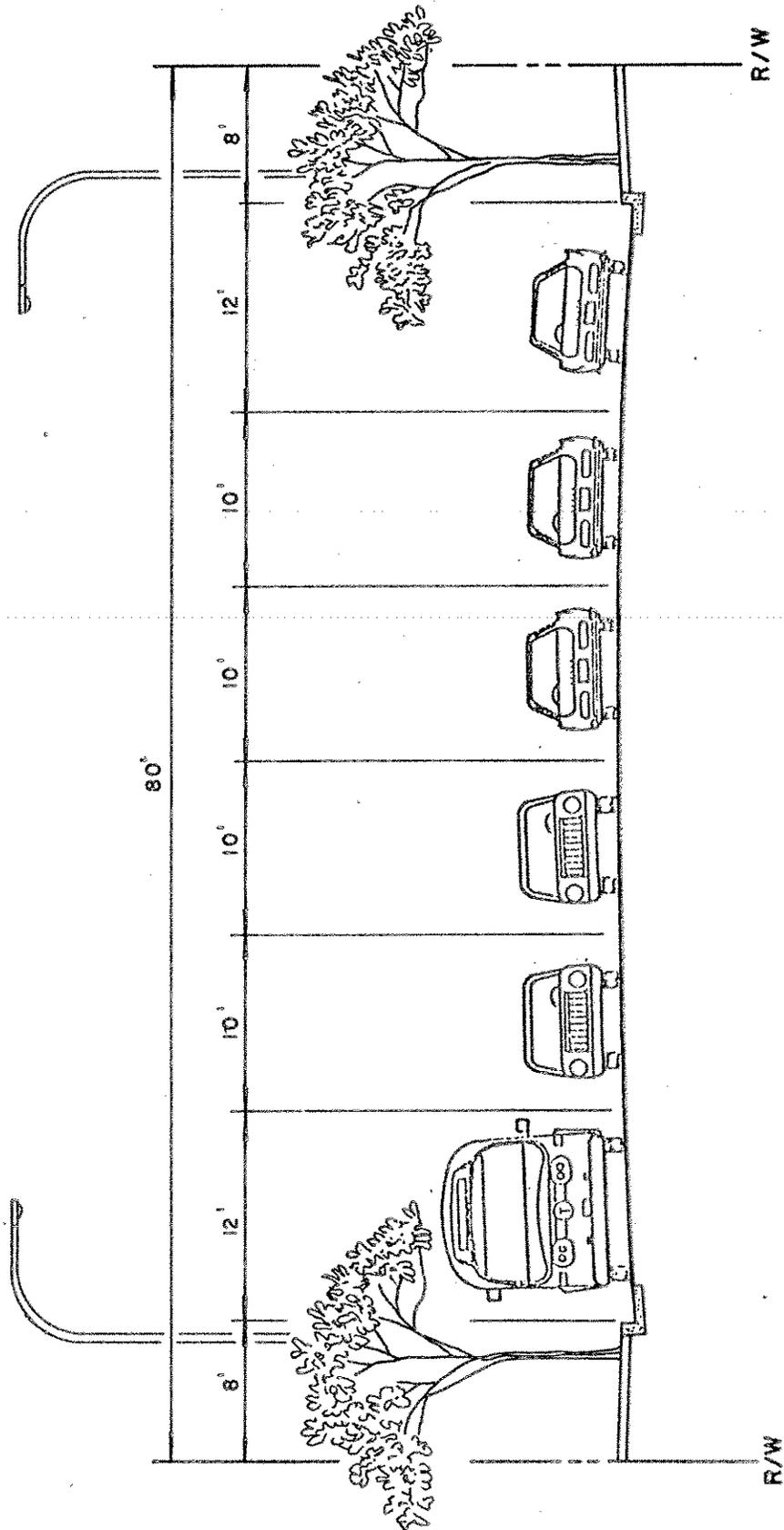
56' RIGHT - OF - WAY ALTERNATIVE
 (NOTE : 40 FT., CURB TO CURB)

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TYPICAL STREET CROSS - SECTIONS

FIGURE VI-1





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TYPICAL STREET CROSS-SECTION VIEW FOR
80-FOOT RIGHT-OF-WAY ALTERNATIVE
KAILUA ROAD

FIGURE VI-2

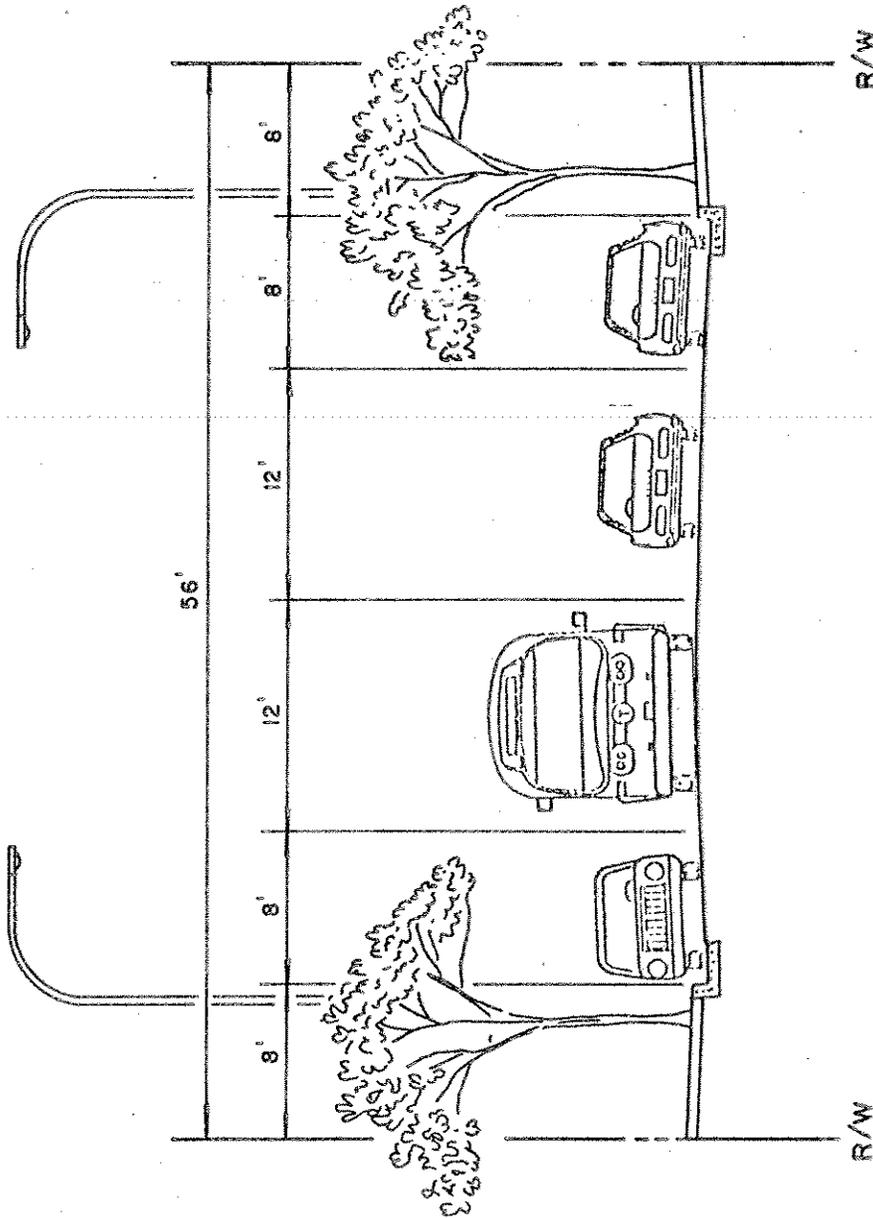
the high school and reduce traffic in the Pohakupu Tract.

A proposed realignment of the general planned access road through the Hawaii Youth Correctional Facility site to Kalaniana'ole Highway was not considered necessary to alleviate traffic demand of the Keolu-Enchanted Lake area for the 1995 design period. In addition, the proposed intermediate school on the correction facility site which the proposed road would have served is not likely to be built because of dwindling school enrollment in Kailua's elementary schools. Hence, the proposed realignment of the GP access road to Kalaniana'ole Highway will not be recommended for adoption on the new Development Plan for Kailua. This recommendation does not preclude the State from constructing the roadway in the future as part of their programs.

The "do nothing" alternative was also selected to a limited degree for the additional improvements of the unimproved or partially improved portions of Kawainui Stream. The City has no immediate plans for improving the stream except for the section surrounding the proposed Hamakua bridge crossing. Further stream improvements are not considered necessary as long as the marsh is retained as a flood plain.

B. Road Width Alternative

The road width alternative is applicable to Hamakua Drive, Kailua Road, Wanaao Road and a portion of Awakea Road.



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RECOMMENDED STREET CROSS SECTION FOR
56 FOOT RIGHT OF WAY ALTERNATIVE
KAILUA ROAD AND WANA AO ROAD

FIGURE VI-3

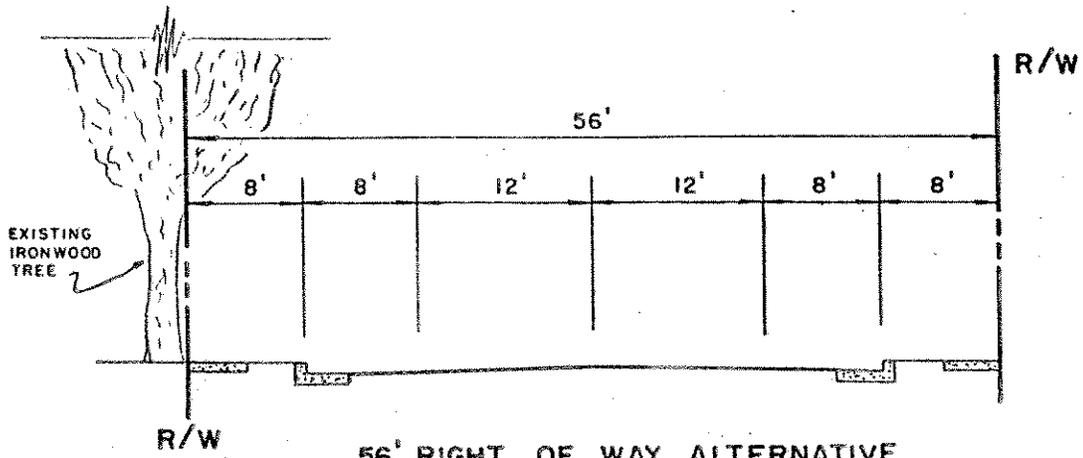
The existing R.O.W.s of Kailua Road, Wanaao Road and Awakea Road is 40 feet. The General Plan R.O.W. is 80 feet for Kailua Road to Wanaao Road, and 60 feet for Wanaao Road. Both proposed and existing R.O.W.s are shown on Figure II-5.

This alternative includes R.O.W. widths of 80 feet, 70 feet, 60 feet, and 56 feet which are applicable to major and secondary streets. If it is determined that a lesser or different R.O.W. is required, a Development Plan amendment would have to be initiated. The 80-foot R.O.W. was analyzed and evaluated for Hamakua Drive and Kailua Road, both which have existing 80-foot R.O.W.s adjacent to the immediate projects' sites.

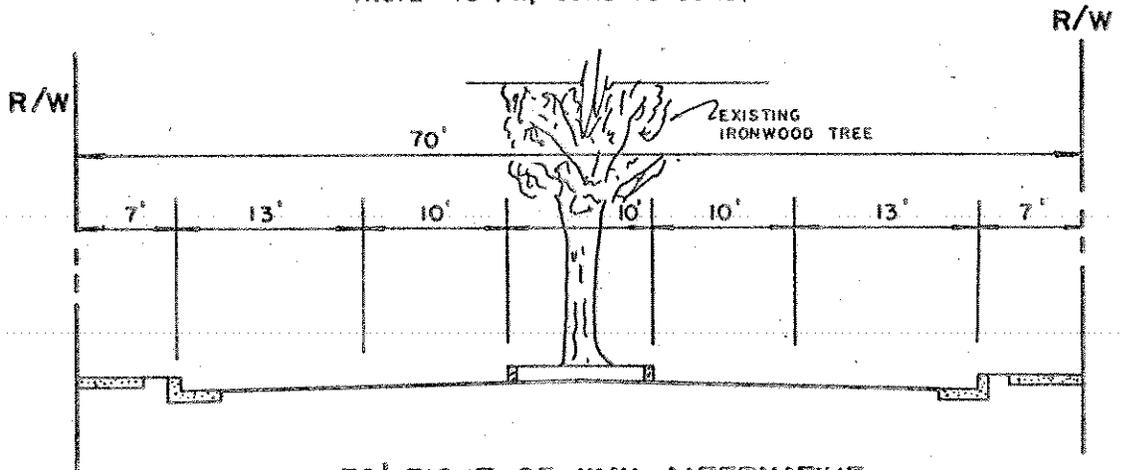
A typical 80-foot R.O.W. can accommodate four moving lanes, exclusive left turn lane, on-street parking on both sides, sidewalks, etc., as shown in Figure VI-1. In the case of Kailua Road, however, the typical section will include six (6) lanes with sidewalks, and etc., as shown in Figure VI-2. On-street parking will be restricted during the peak AM and PM hours. This alternate R.O.W. would be the most costly and would result in the destruction of the ironwood trees on Kailua Road; however, it would provide for the largest traffic capacity, convenience, and safety. The 80-foot R.O.W. alternate was not selected for either Hamakua Drive connection or Kailua Road but was found appropriate for the Hamakua widening.

The 60-foot R.O.W. was analyzed and evaluated for Hamakua Drive, Kailua Road, and Wanaao Road which is General Planned

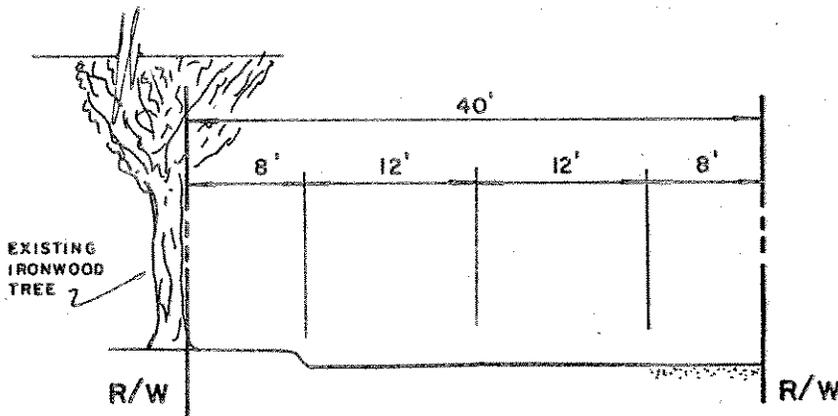




56' RIGHT OF WAY ALTERNATIVE
 (NOTE: 40 FT., CURB TO CURB)



70' RIGHT OF WAY ALTERNATIVE
 (NOTE: 23 FT., CURB TO MEDIAL)



40' RIGHT OF WAY ALTERNATIVE
UNIMPROVED

(NOTE: 20 FT., PAVEMENT)

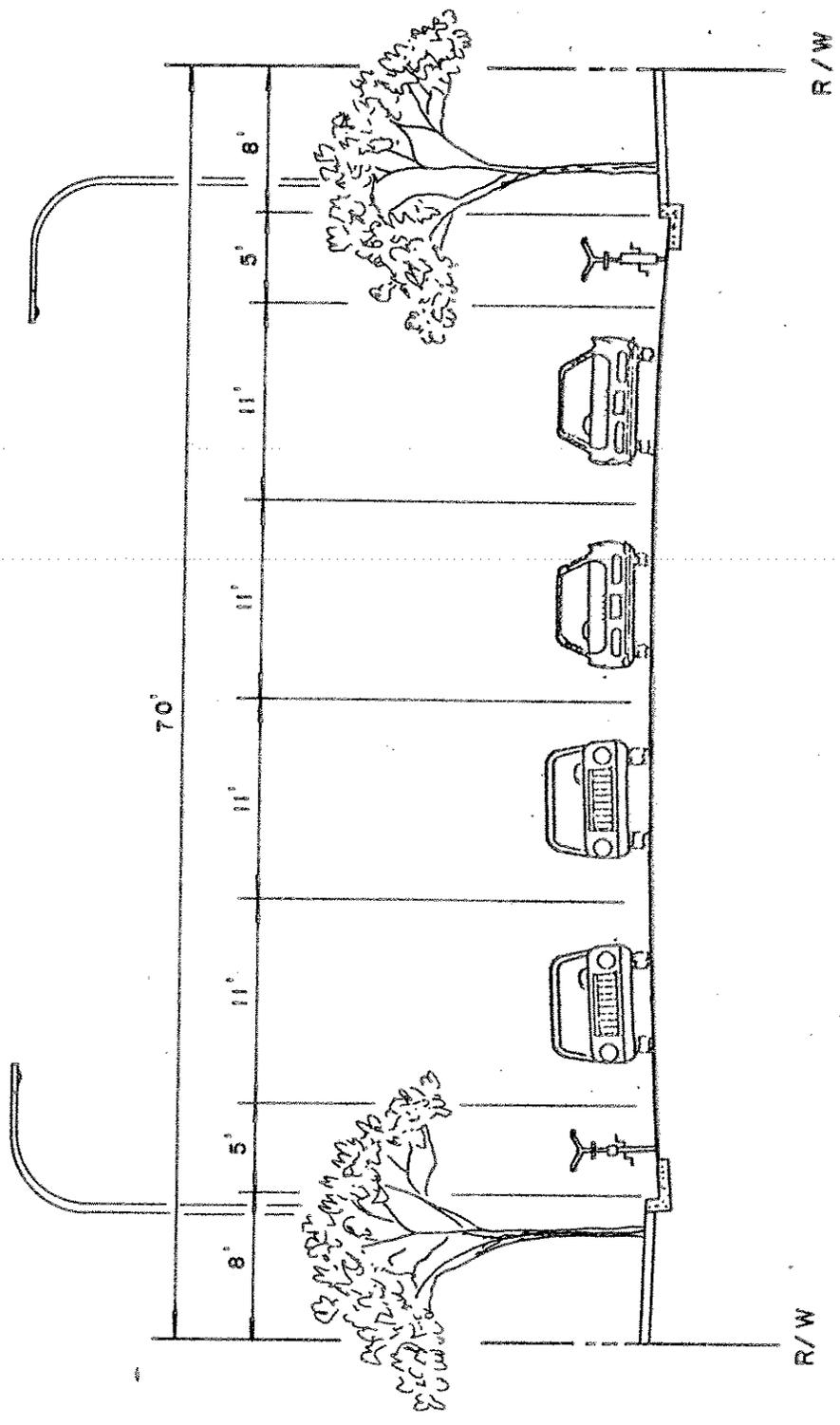
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ALTERNATIVE RIGHT-OF-WAY WIDTH

KAILUA ROAD

FROM HAHANI STREET TO WANA AO ROAD

FIGURE VI-4



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RECOMMENDED STREET CROSS-SECTION VIEW FOR
70-FOOT RIGHT-OF-WAY ALTERNATIVE
HAMAKUA DRIVE

FIGURE VI-5



60-foot. The 56-foot and the 60-foot R.O.W.s will both provide four traffic lanes without on-street parking, or two traffic lanes with on-street parking except at intersections. The 56-foot and the 60-foot R.O.W.s are similar except there are slight differences in the width of the sidewalk area and/or the pavement width. In contrast, a typical subdivision street (minor street) would have a 44-foot R.O.W.; a sidewalk width of 8 feet and a pavement width of 28 feet (two lanes with on-street parking). Typical sections of the 60-foot and 56-foot R.O.W.s are shown on Figures VI-1 and VI-3.

A non-standard road section with a medial strip was evaluated for Kailua Road because it has been suggested previously. This section will include two 13- and two 10-foot traffic lanes with no street parking, two 7-foot sidewalks and a 10-foot wide medial strip where the existing ironwood trees are located.

Because the alignment on Kailua Road is fixed at Hahani Street (end of the existing 80-foot R.O.W. section), the Kailua Town bound lanes would be shifted 35 feet makai of the existing 40-foot R.O.W. The Kailua Beach bound lanes would be shifted 5 feet makai also. In terms of traffic capacity, this alternate roadway would provide additional capacity over the "do nothing" and the "upgrading" alternatives and would be equal to the 60-foot alternative. It would correct the drainage problem, provide safety for pedestrians and save the ironwood

trees. This alternate was not selected since a 56-foot R.O.W. would suffice, and the tree lined medial strip would add to the traffic problems at the Wanaao Road junction.

The results of the evaluation indicated, on the basis of three fully improved general planned access roads serving Keolu-Enchanted Lake, that the R.O.W. widths of Hamakua Drive, Kailua Road and Wanaao Road can be reduced to 70 feet, 56 feet and 56 feet, respectively. The 70-foot R.O.W. width of Hamakua will accommodate four traffic lanes (two lanes in each direction) and two bike lanes. The 56-foot R.O.W. for Kailua Road and Wanaao Road will accommodate two traffic lanes with on-street parking. Hence, there will be available a minimum of three lanes in each direction (two on Hamakua and one on Kailua and Wanaao Road) to handle the peak hour traffic for the year 1995. Another traffic lane could be provided on Kailua and Wanaao Roads by eliminating on-street parking during the peak hour traffic as required.

Reducing the R.O.W. width on Kailua Road from 80 feet to 56 feet would permit the retention of the ironwood trees on the makai boundary except for the single tree near the Hahani Street intersection where a left-turn lane into Hahani Street will be provided. The 56-foot R.O.W. on Kailua and Wanaao Roads will facilitate movements from private driveways from abutting residential and apartment lots. Access from private

driveways is dangerous on the existing 40-foot R.O.W.s at this time on both roads.

Kailua and Wanaao Roads will be retained as bus routes according to the City Mass Transit Division. On the present 40-foot R.O.W., moving traffic is interrupted frequently at bus stops. Retaining the present R.O.W. width, even with improvements, will not eliminate this type of stoppage as observed, for example, on Oneawa Street. A 56-foot R.O.W. would permit moving traffic to pass buses at stops safely.

Ka Awakea and Awakea Roads will retain their present 40-foot R.O.W.s. The existing pavement on Awakea Road between Auwinala and Wanaao Roads will be widened within the existing R.O.W. from 20 to 28 feet as part of the Kailua bikeway system.

C. Alignment Alternative

The alignment alternative was analyzed and evaluated for Hamakua Drive, however, there are limitations because both existing segments are already constructed. Alternate curve alignments (curve radius) can be utilized on Wanaao Road at Kakahiaka Street and Awakea Road at Ka Awakea Road. Off-set alignment will be made for Hamakua Drive and Kailua Road since smaller R.O.W.s were selected. The off-set taper will probably be placed on one side of the street on Hamakua Drive and Kailua Road.

Under the 56-foot R.O.W. alternate for Kailua Road, the mauka boundary will be extended 16 feet past the existing R.O.W. beginning at Hahani Street. The existing 80-foot wide R.O.W. will be extended approximately 100 feet beyond Hahani Street to provide for a left turn lane. The 20 feet wide by 150 feet long offset and tapered section will occur on the Kailua Town-bound side so that all of the ironwood trees except one can be spared from destruction. The 10 feet wide by 150 feet long offset and tapered sections of Hamakua Drive will occur on one end of the improvements to meet the existing 80-foot R.O.W. boundary. Short and sharp convergent tapered sections can be hazardous for motorists particularly during periods of traffic congestion and poor visibility. This condition exists today to some extent at the Kailua Road-Hahani Street intersection.

D. Bridge Structure Alternative

The bridge structure alternative is applicable to the Hamakua Drive improvements. This alternative is design-orientated and would include a two-spanned or a three-spanned bridge. A 2-span bridge would cost about \$30,000 less than a 3-span bridge and would not have a center pier in the stream channel. However, the 2-span bridge would have a higher profile and could affect the sight-distance.

E. Road Improvement Alternative

This alternative is a "catch all" and includes the improvements of some of the roads and "do nothing" on the others, or any other combination thereof. Various traffic patterns were analyzed and evaluated, including the following cases.

1. Improve Hamakua Drive, Kailua Road and Wanaao Road to their general planned widths;
2. Extend Hamakua Drive and "do nothing" with Kailua Road and Wanaao Road;
3. Improve Kailua Road from Hahani Street to Awakea Road (short segment of Wanaao Road) and "do nothing" with Wanaao Road and Hamakua Drive;
4. Improve Kailua Road and Wanaao Road and "do nothing" with Hamakua Drive.
5. Extend Hamakua Drive and improve Kailua Road, but "do nothing" with Wanaao Road; and
6. Recommend improvements to Hamakua Drive, Kailua Road and Wanaao Road.

Among the road network systems evaluated, the most expensive combination was Case 1. The total cost of Case 1, which would consist of the improvements of Hamakua Drive, Kailua Road and Wanaao Road to their general planned R.O.W.s was \$6,765,000. The capacity of this system would far exceed the peak hour traffic requirements for the year 1995. The environmental impact of this combination would be also severe as it will result in the destruction of the ironwood trees and other flora on Kailua Road and Wanaao Road, and the

direct and indirect modification of the Kaelepulu marsh which served as habitat for four native waterbirds on the endangered species list.

The total cost of Case 3 was \$2,020,000 and included the improvements to Kailua Road to its full 80-foot R.O.W. and "no actions" on Hamakua Drive and Wanaao Road. Under this proposal, the 1995 traffic requirements would be met by two 12-foot lanes, four 10-foot lanes and also two 8-foot sidewalk areas. Three lanes in each direction will be provided to accommodate the peak hour traffic. The adverse impact of Case 3 will be the destruction along Kailua Road of the ironwood trees and other flora, the lowering of air quality, and potentially intolerable noise levels for abutting apartment units. This was the least expensive system.

The Case 2 network system would cost about \$3,000,000 and consist of the improvements of Hamakua Drive to a 70-foot R.O.W. No actions would be taken to improve Kailua and Wanaao Roads. In a sense Case 2, Case 5 and Case 6 are similar if one considers that the construction of Hamakua Drive will probably occur before Kailua and Wanaao Roads, the latter two projects would be of the "delaying action" category. It is quite likely that Wanaao Road and perhaps Kailua Road will never be improved since both projects would require the financial participation of the benefited property owners (lessees) in the cost of construction.

Based on past reluctance of property owners to participate in improvement district projects, the City Council recently amended Chapter 24, Revised Ordinances of Honolulu, 1969, as amended, reducing the property owners' share of the general improvements from 66 percent to 50 percent on Council initiated improvement district projects. Since the City assumes the costs of engineering, inspection, and administration, the property owners' share is actually on the order of 35 percent.

By not improving Kailua and Wanaao Roads, the benefits of constructing the Hamakua Drive connection would be marginal. To be sure, traffic volume will be substantially reduced on both roads for the 1995 peak hour traffic if Hamakua Drive was not built. However, when we compared the present traffic volumes on Kailua and Wanaao Roads with the 1995 traffic volumes with the Hamakua Drive connection, the reduction of traffic is marginal and on the order of 1,000 vehicular trips per day. To be specific, traffic volumes would be reduced from the present 18,429 ADT to 17,600 ADT in 1995 on Kailua Road, and 11,134 ADT to 10,000 ADT in 1995 on Wanaao Road.

Consequently, traffic inconveniences, poor drainage and other hazardous road conditions will continue to be experienced on Kailua and Wanaao Roads upon full development of Keolu-Enchanted Lake if the proposed improvements are not implemented.

Returning to Case 2, it was determined that the proposed improvements of the Hamakua Drive connection can reduce the basic traffic requirements on the existing Kailua and Wanaao Roads. This will be accomplished by providing four lanes on Hamakua within a R.O.W. of 70 feet. This connection will be a limited-access roadway with on-street parking prohibited. The adverse impacts associated with this project include the alteration of the marsh and potential destruction of buried archaeological relics. Secondary effects include urbanization of the marsh, and destruction of the habitats of four native endangered waterbirds and potential historic sites.

Conversely, the basic traffic requirements on Kailua Road can be met without building the Hamakua connection by widening the present roadway to six lanes within a R.O.W. of 80 feet. Associated with the project are the adverse impacts on the ironwood trees, air quality and noise level. The primary adverse effect of the Hamakua project is on the natural environment; on the other hand, the human environment will be the elements mostly affected by the Kailua improvements. In terms of cost effectiveness, the cost of improving Kailua Road is about \$1,000,000 less than the Hamakua improvements.

In summary, the reasons for recommending the roadway network system (Case 6) which included the improving of Hamakua Drive to a 70-foot R.O.W., and widening of Kailua and Wanaao Roads to 56 feet are:

1. Hamakua Drive will provide another access route from Keolu-Enchanted Lake to Kailua Town;
2. The network system will give motorists more flexibility and choice of route selection;
3. On-street parking will be provided on Kailua and Wanaao Roads;
4. Flooding on Kailua Road, and to a lesser degree on Wanaao Road, will be eliminated;
5. Pedestrian safety will be enhanced on Kailua and Wanaao Roads;
6. Access to and from private driveways on Kailua and Wanaao Roads can be accomplished safely;
7. One additional traveling lane on Kailua and Wanaao Roads can be provided in each direction, as required during peak traffic hours (restricted on-street parking in effect);
8. Hamakua Drive will provide a direct route from Keolu-Enchanted Lake to Leeward Oahu if the TH-3 freeway and Dike Road are built; and
9. The traffic disruption along Kailua and Wanaao Roads will be less severe during construction with this network system.

F. Upgrading Existing Roads Alternative

The alternative of upgrading existing roads will consist of the improvements of the existing Kailua Road from Hahani Street to Wanaao Road, and Wanaao Road from Kailua Road to

Auwina Street with curbs, gutters, storm drains, and sidewalks within their existing 40-foot R.O.W.s. The recent improvement of Oneawa Street is an example of this alternative. The installation of these improvements will eliminate street flooding, promote safety, and enhance aesthetic quality, however, traffic capacity will not be materially increased. The short segment on Awakea Road between Ka Awakea and Wanaao Road could also be upgraded to provide another improved access from Enchanted Lake via Papalani Street to Wanaao Road. This alternative was not selected since it already provide the necessary traffic capacity which is the basic objective of the proposed action.

G. Mass Transit Alternative

The mass transit alternative consists of adding more municipal buses to serve the Keolu-Enchanted Lake area to reduce traffic demands. Without a bus ridership survey of the Keolu-Enchanted Lake area, it can only be speculated that bus ridership will increase if additional buses were added to serve the affected area. Adding more buses may also have negative effects if the bus routes are along narrow, inadequate roadways such as the unimproved portions of Kailua and Wanaao Roads. As the frequency of buses' stops increase, disruption of traffic movement will also be increased. The use of more buses for the affected area will, therefore, not decrease the traffic volume without an accompanying increase in the R.O.W. width of Kailua and Wanaao Roads.

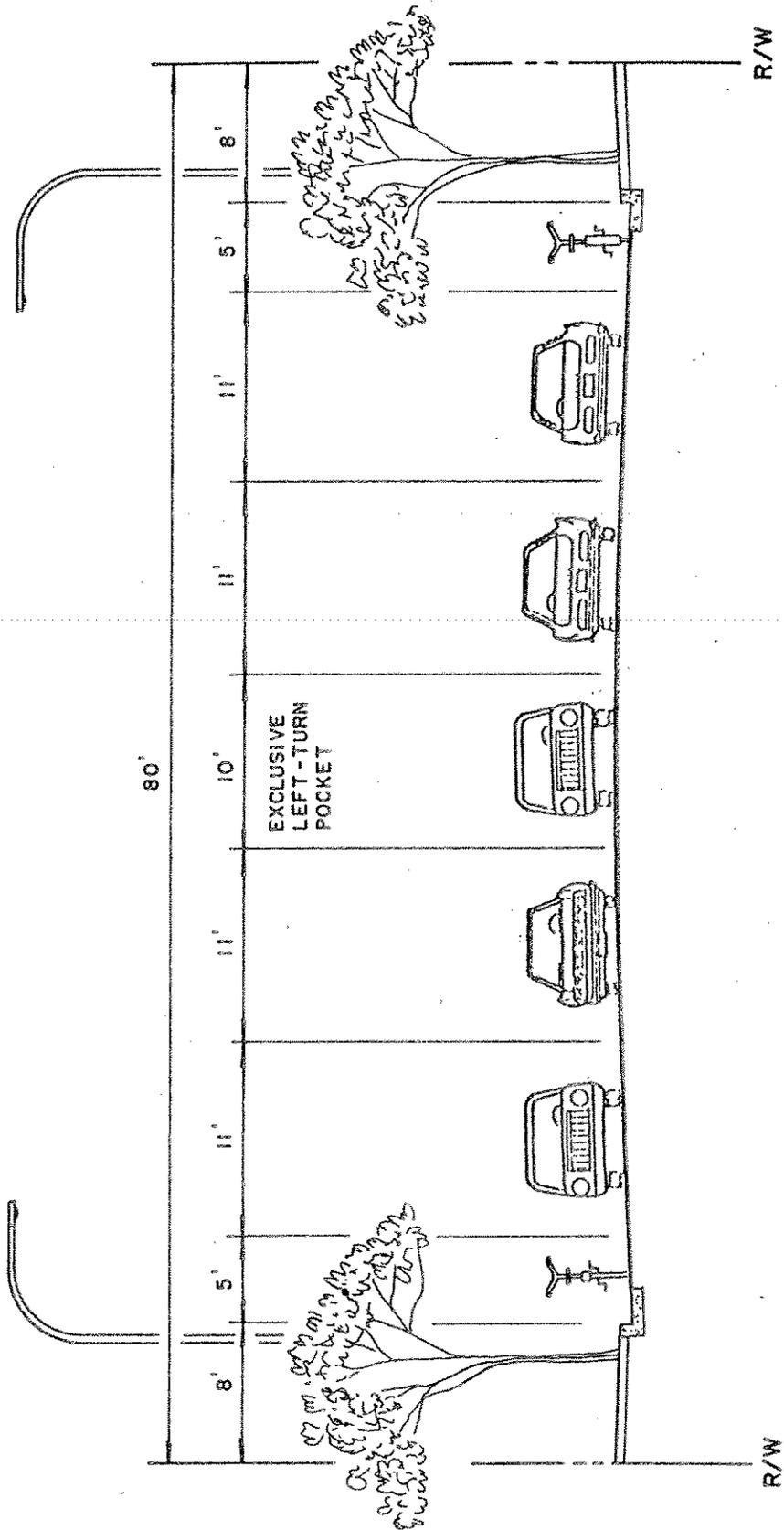
Present bus services under Route 57 includes destinations to Kailua-Waimanalo, Kailua-Sea Life Park, and Kailua-Keolu Drive. Kailua-Waimanalo buses leave the Ala Moana Shopping Center and reach Kailua via Pali Highway and also by way of Kalaniana'ole Highway via Hawaii Kai. Minimum service is once every 30 minutes. Buses serving the Keolu Drive loop originate at Ala Moana Shopping Center and serve Kailua via Pali Highway. Minimum service is once an hour. A total of twelve buses are assigned to Route 57 during the non-peak hours. Three additional buses are placed into service during the peak traffic hours. Data on ridership are sparse, however, it can reach as high as 7,000 (including Hawaii-Kai) passengers a day. The Windward Express buses under Route 85 are utilized during peak hours only. Express buses serve adults as well as transport students to Honolulu schools, including the University of Hawaii during the morning and afternoon hours. Eight buses are in service during the morning rush hours and six in the afternoons. Private bus services are also available for students attending private and public Kailua schools and a private school in Honolulu. At the present time, no additional buses can be diverted to serve the Keolu-Enchanted Lake and Kailua areas without seriously jeopardizing bus services elsewhere. Relief can be considered only if and when the proposed fixed-rail rapid transit system is completed from Hawaii-Kai-Waiialae Shopping Center to Halawa Stadium-Pearl City in Leeward Oahu. This may not occur until 1984. The recently proposed Windward

mass transit alternative by the State Department of Transportation on Pali Highway will not solve the traffic problem for Keolu-Enchanted Lake since its Windward terminal will be located beside Hawaii Loa College.

H. Existing Hamakua Drive Alternative

The alternatives for the proposed widening of Hamakua Drive between Kailua Road and Hekili Street include the retention of the present 40-foot pavement within the existing 56-foot R.O.W. under the "no action" alternate or widening the R.O.W./pavement width to 70/54 feet or 80/64 feet. The R.O.W./pavement width of 56/40 feet of the existing roadway includes two north-bound lanes, one of which is used exclusively as a left turn lane onto Kailua Road and one south-bound lane plus an on-street parking strip.

The existing R.O.W./pavement width is inadequate to meet the traffic requirements of Hamakua Drive which will be four 11-foot lanes and two 5-foot bike lanes. These requirements can be met by a 70-R.O.W., however, another lane for left turn movement onto Kailua Road intersection is considered essential. This need for a left turn lane can be accommodated within a 80-foot R.O.W.



DEPARTMENT OF PUBLIC WORKS
 CITY & COUNTY OF HONOLULU

**RECOMMENDED STREET CROSS-SECTION VIEW FOR
 80-FOOT RIGHT-OF-WAY ALTERNATIVE
 KAILUA ROAD TO HEKILI STREET
 HAMAKUA DRIVE**

FIGURE VI-6



TABLE VI-1

SUMMARY EVALUATION OF ROAD NETWORK SYSTEMS

PROJECT	ALTER-NATIVE	PROJECT & SYSTEM COSTS	NATURAL ENVIRONMENT				HUMAN ENVIRONMENT				SECOND-ARY ³
			AIR	BIRDS	FAUNA	WETLAND	NOISE	TRAFFIC ¹	PARKING ²		
<u>Case 1</u>											
Hamakua Dr.	80' ROW	\$3,370,000	NE	S	NE	S	M	B-C	a	DEV-S	
Kailua Rd.	80' ROW	2,020,000	NE-M	NE	S	NO	M	B-C	a	FLO-B	
Wanaao Rd.	60' ROW	1,375,000	NE	NE	M	NO	M	B-C	a	FLO-B	
TOTAL COST		6,765,000									
<u>Case 2</u>											
Hamakua Dr.	70' ROW	3,006,000	NE	S	NE	S	M	B-C	b	DEV-S	
Kailua Rd.	NO ACTION	-	M-S	NO	NO	NO	M-S	E	b	FLO-S	
Wanaao Rd.	NO ACTION	-	NE-M	NO	NO	NO	M	D	b	FLO-M	
TOTAL COST		3,006,000									
<u>Case 3</u>											
Hamakua Dr.	NO ACTION	-	NO	NO	NO	NO	NO	NO	NO	NO	
Kailua Rd.	80' ROW	2,020,000	M-S	NE	S	NO	S	B-C	a	FLO-B	
Wanaao Rd.	NO ACTION	-	M	NO	NO	NO	M	D	b	FLO-M	
TOTAL COST		2,020,000									

Impact Rating: Severe (S); Moderate (M); Negligible (NE); None (NO); Unknown (U); Beneficial (B)
 3. Development (DEV); Flooding (FLO).

1. Level of Service: Free Flow (A), Stable Flow (B-C), Approaching Unstable Flow (D), Unstable Flow (E), Forced Flow (F).
 2. Parking: Permitted (a), Prohibited (b), Restricted (c).



TABLE VI-1

SUMMARY EVALUATION OF ROAD NETWORK SYSTEMS

PROJECT	ALTER-NATIVE	PROJECT & SYSTEM COSTS	NATURAL ENVIRONMENT					HUMAN ENVIRONMENT				SECOND-ARY ²	
			AIR	BIRDS	FAUNA	WETLAND	NOISE	TRAFFIC	PARKING ²				
<u>Case 4</u>													
Hamakua Dr.	NO ACTION	-	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Kailua Rd.	80' ROW	\$2,020,000	M-S	NE	S	NO	M-S	B-C	a	FLO-B			
Wanaao Rd.	56' ROW	1,335,000	M	NE	M	NO	M	B-C	a	FLO-B			
TOTAL COST		3,355,000											
<u>Case 5</u>													
Hamakua Dr.	70' ROW	3,006,000	NE	S	NE	S	M	B-C	b	DEV-S			
Kailua Rd.	56' ROW	1,654,000	M-S	NE	M	NO	M-S	B-C	a	FLO-B			
Wanaao Rd.	NO ACTION	-	NE	NE	NO	NO	M	D	b	FLO-M			
TOTAL COST		4,660,000											
<u>Case 6</u>													
Hamakua Dr.	70' ROW	3,006,000	NE	S	NE	S	M	B-C	b	DEV-S			
Kailua Rd.	56' ROW	1,654,000	M-S	NE	M	NO	M-S	B-C	a	FLO-B			
Wanaao Rd.	56' ROW	1,335,000	NE	NE	M	NO	M	B-C	a	FLO-B			
TOTAL COST		5,995,000											

Impact Rating: Severe (S); Moderate (M); Negligible (NE); None (NO); Unknown (U); Beneficial (B)

3. Development (DEV); Flooding (FLO).

1. Level of Service: Free Flow (A), Stable Flow (B-C), Approaching Unstable Flow (D), Unstable Flow (E), Forced Flow (F).

2. Parking: Permitted (a), Prohibited (b), Restricted (c).



VII. UNAVOIDABLE ADVERSE IMPACT

The unavoidable adverse impacts common to all of the projects are those associated with construction activities. Construction related impacts are short-term in duration and include excessive noise level, and lowering of air quality by fugitive dust and exhaust emission from construction equipment. For the road projects there will also be traffic inconveniences for through-traffic as well as local traffic. Poor accessibility into private driveways will be experienced by abutting residents of the road widening projects. Parking in areas such as the existing Hamakua Drive between Hekili Street and Kailua Road would be banned.

Where trench excavation is required for sewers and storm drains, some turbidity will occur if discharges of dewatered groundwater are to receiving waters. Turbidity will occur in Kawainui Stream during the dredging and construction of the pile foundations of the Hamakua bridge supports. The same will be true, if channel improvements of Kawainui Stream are made in the future in conjunction with any development within the Kaelepulu marsh.

The long-term adverse impacts are peculiar to each of the proposed projects. The most serious impact will be the alteration of about two acres of Kaelepulu marsh by the Hamakua Drive connection. The change in land form will be

permanent. The loss of two acres of the marsh which serves as the habitats for four endemic waterbirds will not be as severe, if the rest of the marsh is not developed for urban use.

Future improvement of Kawainui Stream which will accompany urbanization of the marsh will destroy the interchange of stream water with the marsh during flooding. This water-marsh relationship is needed for the maintenance of the flood plain as the habitat for the Hawaiian Stilt. It must be reiterated that the City has no plans to implement any stream improvement at this time, except for a small area around the bridge abutment.

Construction of the Hamakua Drive connection will result in the increase of vehicular and bike traffic on that roadway. The increase will be particularly felt by abutting residents on the existing roadway in Enchanted Lake. Present traffic on the Enchanted Lake side of Hamakua Drive is limited to local traffic and probably number less than 100 ADT. With the completion of the connection, traffic will be increased to about 8,500 ADT.

Increased traffic will be accompanied by increased noise level and air pollutants. Noise level and CO concentration which are assumed to be of ambient level will be increased to about 63 dBA (L50) and 2 ppm (8-hour concentration),

respectively. The sudden increase of noise level and rise of CO concentration will be noted immediately by the affected residents. Ingress and egress into private driveways will become more difficult.

Although there are potential historic relics along the proposed alignment of Hamakua Drive, the preliminary findings have not been substantiated. Part of the area within the R.O.W. has already been altered during the construction of the deep Kaelepulu trunk sewer. Test pitting and mapping are planned prior to construction in order to prevent accidental destruction of historic relics.

The existing Hamakua Drive between Kailua Road and Hahani Street is through an industrial park which already has an ADT of over 10,000. The industrial park has assorted commercial and industrial establishments, including restaurants, repair shops, super markets, etc. The completion of the Hamakua connection will result in the increase of through-traffic. It is not known whether the increased traffic will be considered adverse or not by the affected commercial and industrial establishments. Increased traffic may result in accrued economic benefits for these establishments.

Widening of Kailua and Wanaao Roads will result in the destruction of some trees and hedges. Although these impacts are severe, none of the flora are on the endangered species

list. Without the Hamakua Drive connection, traffic congestion will become intolerable on Kailua Road in the immediate future. Noise level will rise and CO concentration will be increased. On the other hand, with the implementation of the Hamakua Drive connection, the impacts will be beneficial with decreased noise level and CO concentration.

VIII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES
OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT
OF LONG TERM PRODUCTIVITY

The development of Keolu-Enchanted Lake is a classic example where land use and transportation planning became subservient to the pressure of land development. The General Plan (G.P.) and Detailed Land Use Map (DLUM) of 1964 have served as the guides for the long term development (productivity) of Keolu-Enchanted Lake and have been followed faithfully with the exception of the implementation of the primary access roads. Four general planned access roads were delineated on the GP and DLUM of 1964, the Keolu Drive connection to Kalaniana'ole Highway, Kailua-Wanaao Roads, Hamakua Drive and Ulumanu Drive.

The short term use was to utilize the existing Kailua-Wanaao Roads beginning in 1949, as a means to develop Keolu Hills and Kailua Heights Tracts. Intolerable traffic conditions on Kailua-Wanaao Roads led to an unplanned connection from Ka Awakea Road across a new bridge over Kawainui Stream to Enchanted Lake. This additional access road could not fully be utilized since the original plan was to extend the road to Hahani Street through the former dairy site, paralleling Kailua Road. Instead, the traffic had to be routed to Wanaao and Kailua Road because of development's conflicts.

In the meantime, residential developments continued without abatement and resolution of the traffic problems.

Work on the present Keolu Drive loop and Kalaniana'ole Highway took approximately six years, from 1964 to 1970. Implementation of this second access road was hampered by developer's conflict over Bishop and Castle lands, lack of State funds (for Kalaniana'ole Highway), conflicting land use designations, and lack of sewers. Only when the Federal Housing Administration decided not to approve any further FHA home mortgages, did work begin in earnest on the second access road.

Plans to improve Kailua Road have been unsuccessful on several occasions between 1963 to 1969. Widening of Wanaao Road to its GP R.O.W. has been long opposed since 1963 by its abutting owners (lessees). The Ulumanu Drive extension to Keolu Drive loop has met the same fate as the proposed Kailua and Wanaao Roads improvement.

There appears to be general consensus by Kailua residents on the need to implement the Hamakua Drive connection. State Legislators from Windward Oahu and the Community Associations have designated this project as one of their highest priorities. Since financing of this project appears to be by government funds only, there have been no known objections by abutting property owners regarding potential assessments.

The implementation of the Hamakua Drive connection satisfies the long-term transportation needs (productivity) of the residents of Keolu-Enchanted Lake and Coconut Grove.

Improvements to Kailua and Wanaao Roads, as well as the existing portion of Hamakua Drive between Kailua Road and Hekili Street, are also needed to satisfy the long-term traffic requirements of the Kailua community.

The uses of short-term solutions to permit further urbanization of developing areas have created more problems than they have solved. The proposed actions are compatible with the new General Plan although some deviations have been made, based on actual transportation needs.

The use of about 2 acres of Kaelepulu marsh for the proposed Hamakua connection poses some problems. Four endemic waterbirds on the endangered species list utilize the marsh as their habitat. There are conflicting opinions whether man's best use of the environment take precedent over wildlife. The two acres by itself is not as detrimental if the remaining marsh is retained as it is. The matter is yet to be resolved.

The implementation of the proposed improvements will generally enhance the general environment of Kailua and Keolu-Enchanted Lake. Traffic congestion will be abated

by the distribution of the traffic needs in accordance with the DLUM as modified. The elimination of the Ulumanu Drive extension to Keolu Drive loop is compatible with the desire of the Department of Education. This "no action" recommendation will result in a better environment in Pohakupu Tract and Kailua High School.

IX. COMMITMENT OF RESOURCES

Resources committed to the various projects include State and County funds, labor and fuels, and energy. For improvement district projects, private funds will be committed in the form of assessment. Land, a scarce commodity, will be committed for the road widening projects, the Hamakua connection and the widening of Kawainui Stream. Lands to be utilized by the Hamakua connection are idle and not in active use. Land set aside for the widening of Kailua Road is not in active use along the makai R.O.W. boundary. The mauka set-back area is used by some apartments as parking lots.

The City and County will be committed to the maintenance of the proposed drainage and sewer systems, stream improvements, and new roadway, including street lighting.

The construction of the Hamakua Drive connection would result in the loss of about 2 acres of the marsh which serve as the habitat for four endangered waterbird species. More importantly would be the loss of 3 more acres of the habitat along Kawainui Stream if the stream was improved. No general stream improvements are planned by the City.

If urbanization occurs in the wetland after Hamakua is constructed, the entire marsh will be lost as a wildlife habitat. The aggregate loss of about 35 acres of wildlife habitat would constitute a significant loss of a valuable resource.



X. GOVERNMENTAL POLICIES OFFSETTING ADVERSE EFFECTS

The alteration of the land form of about two acres of the Kaelepulu marsh for the Hamakua Drive connection is considered the most serious long term effects of the proposed projects. As stated earlier, the alternative of constructing the Hamakua connection is to construct a six-lane roadway on Kailua Road from Hahani Street to Wanaao Road within a R.O.W. of 80 feet. The consequences of the Kailua Road alternate is a severe increase of noise level and carbon monoxide concentration as well as other traffic related air pollutants which will be directly affected by abutting residents and apartment dwellers on Kailua Road. In addition, the 80-foot R.O.W. would result in the destruction of about 20 of the controversial ironwood trees.

On the other hand, the adverse impacts of the Hamakua connection alternate will result in the loss of portions of marsh which serves as a habitat for four endangered native waterbirds. Comparing the adverse effects of the two proposed projects, one set of adverse effects directed primarily against the human environment and the other set directed primarily against the natural environment present a quandary.

The General Plan of the City and County adopted in January 1977 contains several broad policies which are applicable

to the proposed action. These policies are listed in Section IV of the EIS.

Under the heading of Natural Environment, Objective "A," "To protect and preserve the natural environment of Oahu."

Policy 6 states, "Protect the natural environment from damaging levels of air, and noise pollution."

(Applicable to Kailua Road alternate)

Policy 7 states, "Protect ... birds and other animals that are unique to the State of Hawaii and the Island of Oahu." (Applicable to Hamakua Drive alternate)

Policy 8 states, "Protect mature trees on public lands ..."

(Applicable to Kailua Road alternate)

Objective "B," "To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors."

Policy 1 states, "Protect the Island's well-known resources: its... marshes ... and streams." (Applicable to Hamakua Drive alternate)

Under the heading of Transportation, Objective "A," "To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost ..."

Policy 5 states, "Improve roads in existing communities to reduce congestion and eliminate unsafe conditions."

(Applicable to Kailua Road alternate)

We thus have offsetting local government's policies
offsetting adverse environmental effects.

XI. IDENTIFICATION OF AGENCIES CONSULTED

The following agencies were consulted in the preparation of the assessment process:

Federal Agencies

U. S. Army Engineer District, Honolulu
U. S. Coast Guard
U. S. D. I., Fish and Wildlife

State Agencies

Department of Education
Department of Land and Natural Resources,
Fish and Game Division
Department of Transportation
State Historic Preservation Office

City Agencies

Board of Water Supply
Department of General Planning
Department of Land Utilization
Department of Parks and Recreation
Department of Transportation Services
Honolulu Fire Department
Honolulu Police Department



XII. AGENCIES AND INDIVIDUALS CONSULTED ON THE PREPARATION OF THE EIS.

Federal Agencies

U. S. Army Engineer District, Honolulu
U. S. Coast Guard
U. S. D. I. Fish and Wildlife
U. S. D. A. Soil Conservation Service²

State Agencies

Department of Agriculture²
Department of Land and Natural Resources
Department of Transportation
Department of Planning and Economic Development
Department of Health
Department of Accounting and General Services
Office of Environmental Quality Control²
Department of Social Services and Housing¹

City Agencies

Board of Water Supply
Department of General Planning
Department of Land Utilization
Department of Transportation Services
Department of Parks and Recreation
Kailua Neighborhood Board No. 31

Other

Lani-Kailua Outdoor Circle¹
Enchanted Lake Community Association¹
Pohakupu Community Association
Kailua Chamber of Commerce¹
Olomana Community Association¹
Lewers and Cooke, Ltd.¹
Kaneohe Ranch Co., Ltd.¹
Life of the Land¹
Kailua Community Council¹
American Lung Association
James C. Castle^{3, 1}
James Gordon McIntosh^{3, 1}
Hawaiian Trust Co., Ltd.^{3, 1}
Iolani School^{3, 1}
Representative John J. Medeiros^{3, 1}

1 - No response.

2 - No comments.

3 - Consulted party by request.



XIII. REPRODUCTION AND RESPONSES

Included in this section are letters and memorandums received during the consultation period and our responses thereto. No responses were prepared for letters with no comments.

Federal Agencies

U. S. Army Engineer District, Honolulu (6/28/77)
U. S. Coast Guard (5/31/77)
U. S. D. I. Fish and Wildlife (7/18/77, 7/25/77)
U. S. D. A. Soil Conservation Service (6/6/77)

State Agencies

Department of Agriculture (5/20/77)
Department of Land and Natural Resources (6/15/77)
Department of Planning and Economic Development (6/14/77)
Department of Transportation (6/15/77)
Department of Health (6/3/77)
Department of Accounting and General Services (6/14/77)
Office of Environmental Quality Control (6/3/77)

City Agencies

Board of Water Supply (6/1/77)
Department of General Planning (5/21/77)
Department of Land Utilization (6/16/77)
Department of Transportation Services (6/27/77)
Department of Parks and Recreation (8/9/77)
Kailua Neighborhood Board No. 31 (6/28/77)

Others

American Lung Association (6/27/77)
Pohakupu Community Association (8/15/77)



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7704852



DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, CORPS OF ENGINEERS
BLDG. 230, FT. SHAFTER
APO SAN FRANCISCO 96558

PODED-PV

RECEIVED
DEPT. OF PUBLIC WORKS
JUN 28 JUN 3 037 PH '77
TO ENV
Engng (cj)

Mr. Wallace Miyahira, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

There is no objection to the proposed action. The Hamakua Drive crossing of Kawainui Stream and extension over a small remnant of Kaelepulu Marsh may require Department of the Army permits. You are advised to contact Mr. Stanley Arakaki, Chief, Operations Branch, phone: 438-9258, for further information concerning permit requirements.

Thank you for the opportunity to review the notice.

Sincerely yours,

for 
KISUK CHEUNG
Chief, Engineering Division



ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-394

June 29, 1977

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineer District, Honolulu
Fort Shafter, Bldg. 230
APO San Francisco 96558

Dear Mr. Cheung:

Subject: Your Letter of June 23, 1977 Responding
to the EIS Preparation Notice for the
Proposed Improvements of Hamakua Drive and
Related Streets Serving the Keolu-Enchanted
Lake Area, Kailua, Hawaii

Comments in the subject letter are acknowledged. A request for a Department of the Army permit under Section 404 of PL 92-500 for the proposed bridge crossing and drain outlets will be submitted to your office at the appropriate time.

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. Miyahira".

WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

RECEIVED
DEPT. OF PUBLIC WORKS

JUN 1 2 01 PM '77

TO ENVU
Engleby

7704172
Address reply to:
COMMANDER (oan)
Fourteenth Coast Guard District
677 Ala Moana
Honolulu, Hawaii 96813
Phone: 808-546-7130

16590
Serial 32177
31 MAY 1977

Mr. Wallace Miyahira
Director & Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

The Environmental Impact Statement preparation notice for the proposed improvements of Hamakua Drive and related streets serving the Keolu-Enchanted Lake area in Kailua has been reviewed.

The Coast Guard's interest in this project is primarily relative to the construction or alteration of the bridges over Kaelepulu Stream, namely Hamakua Drive extension, Wanaao Drive and Ka Awakea Road widening, and the effect of this project on the navigation of Kaelepulu Stream, if any. In this regard, to completely address the effects of this project, the EIS should address the present and possible future uses of the waterway by vessels of any type and the present and proposed navigational clearances provided by the existing and proposed bridges over Kaelepulu Stream.

The opportunity to comment on the preparation of this EIS is appreciated.

Sincerely yours,

A. J. HAGSTROM

Commander, U. S. Coast Guard
Chief, Aids to Navigation Branch
Fourteenth Coast Guard District
By direction of the District Commander



August 12, 1977

Commander (oan)
Fourteenth Coast Guard District
677 Ala Moana
Honolulu, Hawaii 96813

Gentlemen:

Subject: Your Letter 16590 Serial 32177,
Dated May 31, 1977, Commenting on
the EIS Preparation Notice for the
Proposed Improvements of Hamakua
Drive and Related Streets Serving
the Keolu-Enchanted Lake Area,
Kailua, Hawaii

With respect to navigational clearances for the proposed Hamakua Drive bridge over Kawainui (Kaelepulu) Stream, we have been informed by the City Department of Parks and Recreation by memorandum dated August 9, 1977, that a good potential exist for canoeing activities in the affected portion of Kawainui Stream. Parks and Recreation recommended a minimum navigational clearance of 6 feet for the proposed bridge.

Our preliminary findings indicate that water surface elevations of Kaelepulu and Kawainui Streams are tidal influenced even during the normal period when the stream mouth is blocked by the sand bar at Kailua Beach Park. Therefore, we have tentatively set the elevation of the bridge soffit at 7.5 feet mean sea level (msl), to provide for a minimum of six (6) feet clearance during all periods of the normal 2-foot tidal fluctuation. We do not anticipate any canoe activities during storm flow periods when the water surface elevation of the streams will be higher.

The present clearance (soffit elevation to mean sea level) of the existing bridges over Kawainui Streams at Kailua Road, Ka Awakea Road and Wanaao Road are 7.75 feet, 3.00 feet and 6.00 feet,

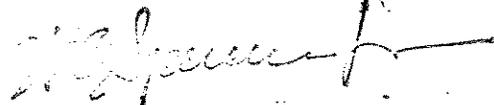
Commander

- 2 -

August 12, 1977

respectively. If you need any other information, you may call Mr. Chew Lun Lau at 523-4150.

Very truly yours,



For WALLACE MIYAHIRA
Director and Chief Engineer

cc: Dept. of Parks & Recreation
Div. of Engineering

7704852



DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, CORPS OF ENGINEERS

BLDG. 230, FT. SHAFTER
APO SAN FRANCISCO 96558

RECEIVED
DEPT. OF PUBLIC WORKS

JUN 28 JUN 3 037 PM '77

TO ENV
Engrg (cy)

PODED-PV

Mr. Wallace Miyahira, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

There is no objection to the proposed action. The Hamakua Drive crossing of Kawainui Stream and extension over a small remnant of Kaelepulu Marsh may require Department of the Army permits. You are advised to contact Mr. Stanley Arakaki, Chief, Operations Branch, phone: 438-9258, for further information concerning permit requirements.

Thank you for the opportunity to review the notice.

Sincerely yours,

for 
KISUK CHEUNG
Chief, Engineering Division



ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-394

June 29, 1977

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineer District, Honolulu
Fort Shafter, Bldg. 230
APO San Francisco 96558

Dear Mr. Cheung:

Subject: Your Letter of June 23, 1977 Responding to the EIS Preparation Notice for the Proposed Improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area, Kailua, Hawaii

Comments in the subject letter are acknowledged. A request for a Department of the Army permit under Section 404 of PL 92-500 for the proposed bridge crossing and drain outlets will be submitted to your office at the appropriate time.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

RECEIVED
DEPT. OF PUBLIC WORKS

JUN 1 2 01 PM '77

TO ENVU
Engg (aj)

7704172
Address reply to:
COMMANDER (oan)
Fourteenth Coast Guard District
677 Ala Moana
Honolulu, Hawaii 96813
Phone: 808-546-7130

16590
Serial 32177
31 MAY 1977

Mr. Wallace Miyahira
Director & Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

The Environmental Impact Statement preparation notice for the proposed improvements of Hamakua Drive and related streets serving the Keolu-Enchanted Lake area in Kailua has been reviewed.

The Coast Guard's interest in this project is primarily relative to the construction or alteration of the bridges over Kaelepulu Stream, namely Hamakua Drive extension, Wanaao Drive and Ka Awakea Road widening, and the effect of this project on the navigation of Kaelepulu Stream, if any. In this regard, to completely address the effects of this project, the EIS should address the present and possible future uses of the waterway by vessels of any type and the present and proposed navigational clearances provided by the existing and proposed bridges over Kaelepulu Stream.

The opportunity to comment on the preparation of this EIS is appreciated.

Sincerely yours,

A. J. HAGSTROM

Commander, U. S. Coast Guard
Chief, Aids to Navigation Branch
Fourteenth Coast Guard District
By direction of the District Commander

August 12, 1977

Commander (oan)
Fourteenth Coast Guard District
677 Ala Moana
Honolulu, Hawaii 96813

Gentlemen:

Subject: Your Letter 16590 Serial 32177,
Dated May 31, 1977, Commenting on
the EIS Preparation Notice for the
Proposed Improvements of Hamakua
Drive and Related Streets Serving
the Keolu-Enchanted Lake Area,
Kailua, Hawaii

With respect to navigational clearances for the proposed Hamakua Drive bridge over Kawainui (Kaelepulu) Stream, we have been informed by the City Department of Parks and Recreation by memorandum dated August 9, 1977, that a good potential exist for canoeing activities in the affected portion of Kawainui Stream. Parks and Recreation recommended a minimum navigational clearance of 6 feet for the proposed bridge.

Our preliminary findings indicate that water surface elevations of Kaelepulu and Kawainui Streams are tidal influenced even during the normal period when the stream mouth is blocked by the sand bar at Kailua Beach Park. Therefore, we have tentatively set the elevation of the bridge soffit at 7.5 feet mean sea level (msl), to provide for a minimum of six (6) feet clearance during all periods of the normal 2-foot tidal fluctuation. We do not anticipate any canoe activities during storm flow periods when the water surface elevation of the streams will be higher.

The present clearance (soffit elevation to mean sea level) of the existing bridges over Kawainui Streams at Kailua Road, Ka Awakea Road and Wanaao Road are 7.75 feet, 3.00 feet and 6.00 feet,

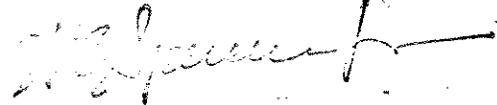
Commander

- 2 -

August 12, 1977

respectively. If you need any other information, you may call Mr. Chew Lun Lau at 523-4150.

Very truly yours,



For WALLACE MIYAHIRA
Director and Chief Engineer

cc: Dept. of Parks & Recreation
Div. of Engineering



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Office of Endangered Species
300 Ala Moana Blvd, Room 5302
P.O. BOX 50167
HONOLULU, HAWAII 96850

RECEIVED
DEPT. OF PUBLIC WORKS

JUL 19 1 44 PM '77
TO EWL
by (g)

77 05377

July 18, 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

This is in response to your letter of June 7, 1977 inquiring about the possibility of the Federal Government purchasing the abutting marsh at the Hamakua Drive site for endangered waterbirds. Owing to limited funds the Fish and Wildlife Service is concentrating on acquisition and development through various means the major waterbird areas throughout the state. We have no plans to acquire the area you mention. Perhaps the State of Hawaii does.

However, areas of lesser value collectively are important to endangered waterbirds and should be preserved wherever possible to complement the major areas. There has been a steady erosion of such areas, especially on Oahu. All levels of government have a responsibility to see that such areas are not destroyed. Section 7 of the Endangered Species Act of 1973 prohibits any Federal agency from engaging in authorizing or funding any activity which will further jeopardize the continued existence of an endangered or threatened species.

We would be glad to support any action to downzone the abutting marsh to State Land Use Conservation or CZM Preservation.

Sincerely,

Eugene Kridler
Endangered Species Coordinator



Save Energy and You Serve America!

ENV 77-407

July 22, 1977

Mr. Eugene Kridler
Office of Endangered Species
Fish and Wildlife Service
U.S. Department of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kridler:

Subject: Your Letter of July 18, 1977,
Responding to the Proposed Improvements
of Hamakua Drive, Kailua, Hawaii

Your support of any action to down-zone the abutting marsh adjacent to the proposed connection of Hamakua Drive to State Land Use Conservation or CZM Preservation is acknowledged. The matter of down-zoning will be discussed in the EIS.

Very truly yours,



For WALLACE MIYAHIRA
Director and Chief Engineer



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
300 Ala Moana Blvd., Rm. 5302
P. O. Box 50167
Honolulu, Hawaii 96850

7705515
RECEIVED
DEPT OF PUBLIC WORKS

JUL 26 11 42 AM '77
TO ENVU

Engler (fj)

Reference: ES

July 25, 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Re: Environmental Impact Statement
Preparation Notice for the
proposed improvements of Hamakua
Drive and related streets serving
the Keolu-Enchanted Lake Area
Kailua, Koolaupoko, Oahu, Hawaii

Dear Mr. Miyahira:

As per your request, we have reviewed the referenced document, dated 16 May 1977. In addition, Mr. Eugene Kridler, U. S. Fish and Wildlife Service Endangered Species Coordinator, has submitted his response dated 18 July 1977, concerning potential impacts on endangered waterbirds and the Service's willingness to support downzoning of the marsh abutting the proposed project. (See attached map).

Construction of the Hamakua Drive extension and industrial and residential development may necessitate stream modification. Downzoning this area could reduce the need to channelize Kawainui Stream below the Hamakua Drive bridge. Stream modification described in the referenced preparation statement, not only would result in the further destruction of stream and wetland habitat within the immediate project area, but also would reduce or eliminate flooding in the abutting wetland. It is during this flooding period that the area becomes particularly valuable as Hawaiian Stilt habitat.

Should this reach be downzoned and channelization still required, the present stream embankment elevation should be maintained to permit flooding in the wetland area (Page V 12-13). A description of the methods and materials anticipated for the construction of the raised embankment should be included in the environmental impact statement.



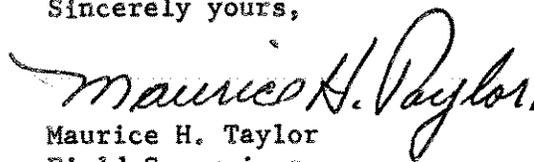
Save Energy and You Serve America!

We support the suggestion provided by the State Fish and Game Division, i.e. additional habitat for the endangered waterbirds and waterbird species be provided in conjunction with the road project. If habitat acquisition is not possible, we suggest that enhancement measures such as habitat creation or improvement be investigated and utilized as appropriate (Page V-13).

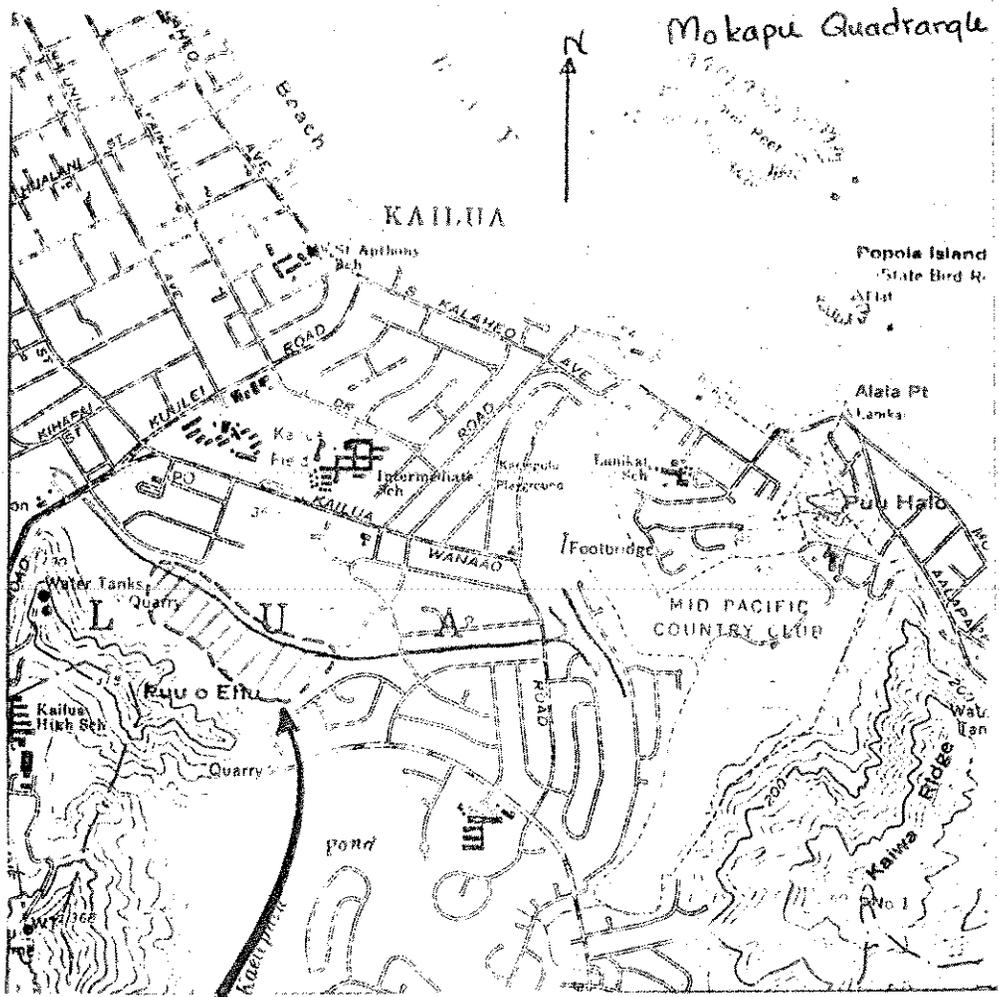
Mitigation measures such as use of silt screens and limiting dredging to low flow periods, also were suggested to help offset adverse aquatic habitat impacts. We urge their use and also recommend the revegetation of soils exposed during project construction to minimize erosion and decrease turbidity.

Thank you for the opportunity to review this document. Please keep us informed on the progress of the proposed project.

Sincerely yours,


Maurice H. Taylor
Field Supervisor

cc: HA
ARD(AE)
SE
HDF&G



ENV 77-416

July 28, 1977

Mr. Maurice H. Taylor
Division of Ecological Services
Fish and Wildlife Service
U. S. Department of the Interior
300 Ala Moana Blvd., Room 5302
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Taylor:

Subject: Your Letter of July 25, 1977,
Responding to the EIS Preparation
Notice for the Proposed Improvements
of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake
Area, Kailua, Hawaii

We have no plans at the present time to improve any portions of Kawainui Stream except at the proposed Hamakua bridge crossing. There appears to be no further need to improve the stream, provided the marsh area is retained in its present conditions.

In the event the marsh area is developed into industrial and residential uses, channelization of the unimproved or partially improved portions of Kawainui Stream will be required. The cost of such improvements will be borne by the developer or subdivider of the affected areas. To the extent possible, we will require the use of silt screens and other mitigative measures and attempt to limit the period of dredging during low flow periods.

Of course, if the marsh area is developed into urban uses, the entire habitat for the endangered waterbird species will be destroyed. For this reason, it might be pointless to provide for additional wildlife habitats at the site of the proposed Hamakua improvements. Nevertheless, the Department of Public Works will fully cooperate with the State Fish and Game Division

Mr. Maurice H. Taylor

- 2 -

July 28, 1977

and your agency in order to minimize the potential adverse effects of the Hamakua Drive connection.

Very truly yours,



For WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

7704403

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. 50004, Honolulu, HI 96813

RECEIVED
DEPT. OF PUBLIC WORKS

June 6, 1977

JUN 8 1 52 PM '77

TO _____

*ENJ dl
(engr by)*

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King St.
Honolulu, HI 96813

Dear Mr. Miyahira:

Subject: EIS Preparation Notice for the Proposed Improvement of
Hamakua Drive and Related Streets Serving the Keolu-Enchanted
Lake Area, Kailua, Koolaupoko, Hawaii

We have reviewed the above EIS and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,

Jack P. Kanalz
Jack P. Kanalz
State Conservationist



77 03287

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

RECEIVED
DEPT. OF PUBLIC WORKS
JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE
YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

MAY 24 8 43 AM '77
TO ENVU
Engrg. (C&C)
BOARD MEMBERS:
IRWIN M. HIGASHI
MEMBER - AT - LARGE
ERNEST F. MORGADO
MEMBER - AT - LARGE
KALFRED K. YEE
MEMBER - AT - LARGE
SHIZUTO KADOTA
HAWAII MEMBER
STEPHEN Q. L. AU
KAUAI MEMBER
FRED M. OGASAWARA
MAUI MEMBER

May 20, 1977

MEMORANDUM

To: Mr. Wallace Miyahira, Director and Chief Engineer
Department of Public Works, C&C of Honolulu

Subject: Environmental Impact Statement Preparation Notice
for the Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-Enchanted
Lake Area, Kailua, Koolaupoko, Hawaii

The Department of Agriculture has reviewed subject notice,
and has no comments.

We appreciate the opportunity to review this matter.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

7704596



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DEPT. OF PUBLIC WORKS

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CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

June 15, 1977

- DIVISIONS:
- CONVEYANCES
 - FISH AND GAME
 - FORESTRY
 - LAND MANAGEMENT
 - STATE PARKS
 - WATER AND LAND DEVELOPMENT

Your: ENV 77-340

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

Honorable Wallace Miyahira
Dept. of Public Works
650 So. King St.
Honolulu, Hawaii 96813

Dear Sir:

We have reviewed the EIS preparation notice for Kailua road, drainage, utility and street appliances improvements. We wish to voice our support to the project and offer the following suggestions:

1. Pg. IV-19, para. 1. Amend last sentence to read " ... flats and marsh areas are being used for breeding, nesting, feeding and resting by endemic waterbirds and as feeding and nesting areas by migratory waterbirds and Noio (Hawaiian term, Anous tenuirostris melanogenys).
2. Pg. IV-19, para. 2. Amend second sentence to read "...including Pintails (Anus acuta), Shovellers (Spatula clypeata), Scaups (Aythya affinis), Bufflehead (Bucephala albeola), Pacific Golden Plover (Pluvialis olomiminica fluva), Ruddy Turnstone (Arenaria interpres), Sanderling (Calidris alba), Wandering Tattler (Heteroscelus incanus)." Amend last sentence to read " ... in 1974, and twenty more Koloa were released in January 1977."
3. Pg. IV, para. 2. Correct the following errors in the third sentence:

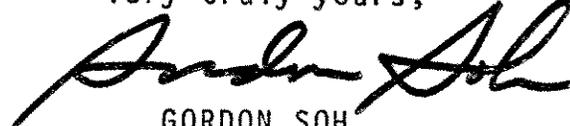
"sandwichensis" to "sandvicensis"
"Blue-Crowned" to "Black-Crowned"

Amend same sentence to read " ... Black-Crowned Night Heron, Cattle Egrets and feral mallards."

Honorable Wallace Miyahira
Page 2
June 15, 1977

4. Page IV-20, para. 3, first sentence. Kaelepulu Pond still provides a small area of endangered waterbird habitat for stilt, coot and gallinule.
5. Pg. IV-22, Table IV-1. Include "feral mallard" under "Exotic Birds."
6. Pg. IV-25, para. 3, first sentence. Correct: "Kamaka Pond" to "Kanaha Pond"
7. Pg. V-19, para. 1, last sentence and para. 2 first sentence. Change: "projects" to "project"
8. Pg. V-19, para. 2, first sentence. Change: "adoptable" to "adaptable"
9. Pg. V-19, para. 3. This paragraph needs to be written. Alternatively, it can be omitted.

Very truly yours,


GORDON SOH
Program Planning Coordinator

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

ENV

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-377

June 20, 1977

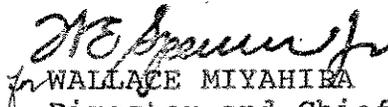
Mr. Gordon Soh
Program Planning Coordinator
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Soh:

Subject: EIS Preparation Notice for the Proposed
Improvement of Hamakua Drive and Related
Streets Serving the Keolu-Enchanted
Lake Area (DLNR 6/15/77)

Your suggestions, 1-9, for improving the subject EIS will be incorporated in the documents. The support of the project from your department is acknowledged.

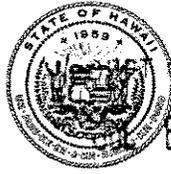
Very truly yours,


for WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

7705141

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



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DEPARTMENT OF PUBLIC WORKS

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DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Evoy (y)

TO
STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FISH AND GAME
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

July 6, 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

SUBJECT: Response to your letter dated June 7, 1977 requesting elaboration on comments provided by letter to you dated March 7, 1977.

Since responding to your EIS Preparation Notice concerning various routes between Keolu and Kailua including the Hamakua Drive extension we have been informed that lands abutting the proposed extension and adjacent lands are privately owned and zoned for urban development.

Construction of the Hamakua Drive extension will provide access for private development of the adjacent lands by landfilling for urban and industrial purposes. This would cause loss of endangered waterbird habitat to a greater extent than the road extension itself. Therefore, government purchase of these lands or the down-zoning to Conservation or CZC Preservation appears to be the only way that preservation of habitat for waterbirds in this area can be assured. We wholeheartedly agree with this approach.

Since planning of design and construction for the road extension and bridge to minimize permanent detrimental effects on endangered species will require engineering expertise as well as wildlife knowledge, meetings to assist with this project have been arranged with Mr. Chew Lum Lau, your Environmental Officer.

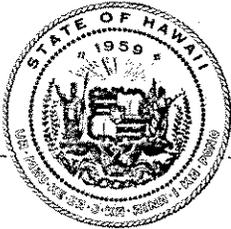
I trust that this will be satisfactory.

Yours truly,

Michio Takata

MICHIO TAKATA, Director
Division of Fish and Game

7704631



DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

RECEIVED
DEPT OF PUBLIC WORKS
JUN 20 10 09 AM '77
TO ENW
Engng (cy)
Ref. No. 3809

June 14, 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Environmental Impact Statement Preparation Notice
for the Proposed Improvements of Hamakua Drive and
Related Streets Serving the Keolu-Enchanted Lake Area,
Kailua, Koolaupoko, Hawaii

We have reviewed the subject EIS Preparation Notice and find that it seems to have adequately identified the major environmental impacts which can be anticipated to result from the proposed project.

We have no other comments to offer at this time, however, as the subsequent EIS may contain other information pertinent to the interests of this department, we request the privilege of commenting further when the statement is available for review.

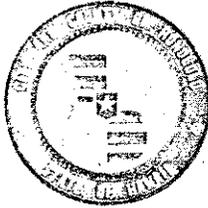
Sincerely,


HIDETO KONO

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

ENV



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-380

June 20, 1977

Mr. Hideto Kono, Director
Department of Planning and Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Kono:

Subject: Your Letter of June 14, 1977, Ref. No. 3809
Responding to the EIS Preparation Notice for
the Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Hawaii

Comments in the subject letter are acknowledged.

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. Miyahira".

WALLACE MIYAHIRA
Director and Chief Engineer

WM:nj

cc: Division of Engineering

7704595

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



RECEIVED
DEPARTMENT OF PUBLIC WORKS

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ENV U

Engg (cc)

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

GEORGE A. L. YUEN
DIRECTOR OF HEALTH

Audrey W. Mertz, M.D., M.P.H.
Deputy Director of Health

Henry N. Thompson, M.A.
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

June 3, 1977

In reply, please refer to:

File: EPHS-SS

MEMORANDUM

To: Mr. Wallace Miyahira, Director and Chief Engineer
Department of Public Works, City & County of Honolulu

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement Preparation Notice for the Proposed
Improvements of Hamakua Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua, Koolaupoko, Oahu

Thank you for allowing us to review and comment on this EIS. The following comments are offered for your consideration.

1. Construction activities must comply with Public Health Regulations, Chapter 44B, Community Noise Control for Oahu.
 - a. An application for community noise permit must be filed and approved by the Department of Health.
 - b. Construction activities must comply with the provisions of the conditional use of permit as stated in Public Health Regulations, Chapter 44B and the conditions of the permit.
2. Traffic noise from heavy vehicles travelling to and from construction site must be minimized to not affect a residential area and must also comply with the provisions of Public Health Regulations, Chapter 44A, Vehicular Noise Control for Oahu.
3. Data on noise level prediction to the residences, schools, and churches due to the expected increase in traffic must be included in the environmental impact statement.

We realize that the plans for the proposed project are still preliminary. We, therefore, reserve the right to impose future environmental restrictions as needed. We will appreciate reviewing construction plans as soon as practicable.


JAMES S. KUMAGAI, Ph.D.

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-376

ANK F. FASI
MAYOR

June 17, 1977

Dr. James S. Kumagai
Deputy Director of Environmental Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Kumagai:

Subject: Environmental Impact Statement Preparation
Notice for the Proposed Improvements of Hamakua
Drive and Related Streets Serving the Keolu-
Enchanted Lake area, Kailua, Koolaupoko,
Oahu (EPHS-SS 6/3/77)

Construction activities will comply with the provisions and conditions of Public Health Regulations (PHR) Chapter 44B, "Community Noise Control for Oahu." The contractor(s) will be required to apply for a noise permit prior to the commencement of construction.

The construction specifications will require that the contractor(s) meet all applicable State and County environmental laws and regulations including the provisions of PHR, Chapter 44A, "Vehicular Noise Control for Oahu."

The anticipated noise levels from vehicular traffic will be calculated for adjacent or abutting schools, churches and typical residences, using methods of prediction contained in National Cooperative Highway Research Program Report 117, as amended.

Very truly yours,


for WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

GEORGE R. ARIYOSHI
GOVERNOR



RECEIVED
DEPT OF PUBLIC WORKS

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

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ENVUll

June 15, 1977

Engreg (cy)

770 4708
E. ALVEY WRIGHT
DIRECTOR

DEPUTY DIRECTORS
WALLACE AOKI
RYOKICHI HIGASHIONNA
DOUGLAS S. SAKAMOTO
CHARLES O. SWANSON

IN REPLY REFER TO:

STP
8.4297

Mr. Wallace Miyahira
Director & Chief Engineer
City & County of Honolulu
Department of Public Works
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Environmental Impact Statement
Preparation Notice for Proposed
Improvements of Hamakua Drive
and Related Streets, Kailua, Oahu.

Thank you for the opportunity to review the subject E.I.S.

Regarding the section on transportation we do suggest that consideration be given for bikeways, as expressed in the recently published Statewide Master Plan for Bikeways, together with the proposed improvement.

Sincerely,

E. ALVEY WRIGHT
Director

cc: LT-P

ENV 77-387

June 23, 1977

Mr. E. Alvey Wright, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Wright:

Subject: Your Letter of June 15, 1977 (STP 8.4297)
Responding to the EIS Preparation Notice
for the Proposed Improvements of Hamakua
Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua, Hawaii

The use of bikeways together with the proposed improvements of the four general planned access roads serving the Keolu-Enchanted Lake area is being evaluated by the City Department of Transportation Services.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering
Dept. of Transportation
Services w/DOT Ltr. STP 8.4297

7704531



GEORGE R. ARIYOSHI
GOVERNOR

RECEIVED
DEPT. OF PUBLIC WORKS

HIDEO MURAKAMI
COMPTROLLER

JUN 15 9 51 AM '77

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

TO ENV 44

Engrg (cy)

LETTER NO. (P) 1608.7

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 118, HONOLULU, HAWAII 96810

JUN 14 1977

Mr. Wallace Miyahira
Director & Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii

Dear Mr. Miyahira:

Subject: Environmental Impact Statement Preparation
Notice for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua,
Koolaupoko, Hawaii

We have reviewed the subject EIS preparation notice and
have the following comments to offer:

1. Page I-2

The last two sentences of the first paragraph
should be clarified and updated as follows: "The
State is constructing a two-lane road from the end
of the existing Akiohala Street to the boundary of
Kailua High School. This road will end in a cul-
de-sac at the bottom of an embankment about 10
feet below the elevation of the school. This is
to provide a second access to the high school
until a permanent road is extended from Akiohala
Street to Kailua Road or Kalaniana'ole Highway.
This temporary road extension will be open only
during school hours and special school activities."

2. Figure I-1

The roadway and designation "Proposed Extension to
Kailua High School (State)" should be revised to

show the temporary road being constructed by the State rather than the General Plan road. (See attached plan.) Kaelepulu Elementary School should be indicated on this and other maps.

3. Page I-6

The section on Ulumanu improvements should be revised. As indicated above, the roadway being constructed by the school is a temporary roadway. Although it will reduce traffic in the Pohakupu Subdivision, this does not mean it will satisfy traffic circulation requirements around the school. This determination should be made by the County Department of Transportation Services.

A draft master plan report for the Hawaii Youth Correctional Facility was prepared by Hawaii Architects and Engineers, Inc., for the State Department of Land and Natural Resources around 1973. This report proposed the realignment of the County General Plan roadway from Keolu Drive to Ulumanu Drive as shown on the attached map. Although a longer road is involved, we support this proposal for the following reasons:

- a. It will eliminate the need to bisect the school with a major roadway and thereby increase student safety.
- b. It will reduce noise pollution to the school.
- c. It will reduce the traffic in Pohakupu Subdivision.

4. Page II-16

The County's December 10, 1975 letter offered to delegate the planning and construction of Ulumanu Drive extension funds available under Act 195, SLH 1975, Item N-1-7 to the State. However, this offer was declined by letter dated May 3, 1976. Therefore, responsibility of planning and constructing the Ulumanu Drive extension has not been transferred to DAGS as indicated.

5. Page III-6

The section on other improvements should be revised as indicated in Items 1. and 3. above.

Mr. Wallace Miyahira
Page 3

Ltr. No. (P)1608.7

6. Page III-20

The extension of Ulumanu Drive through the school will probably increase noise and air pollution in the school.

Thank you for the opportunity to comment on the EIS preparation notice. If we may be of further assistance, please have your staff call Mr. Norman Sahara of the Planning Branch at 548-7660.

Very truly yours,



RIKIO NISHIOKA
State Public Works Engineer

NS:nk 3-4

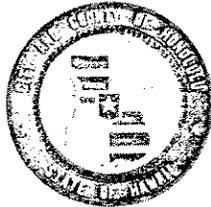
Attachment

cc: Mr. K. Tokushige (w/attachment)
Mr. K. Takata (w/attachment)
Mr. C. Cobb (w/attachment)

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK P. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-381

June 21, 1977

Mr. Rikio Nishioka
Public Works Engineer
Division of Public Works
Department of Accounting and General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Nishioka:

Subject: Your Letter of June 14, 1977 (P) 1608.7
Responding to the EIS Preparation Notice
for the Proposed Improvements of Hamakua
Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua, Hawaii

We are responding to comments in the subject letter in the same order as they appeared.

1. Page I-2. The last two sentences of the first paragraph will be revised as appropriate.
2. Figure I-1. The proposed second access road to Kailua High School from Akiohala Street and the general planned extension of Ulumanu Drive to Keolu Drive loop will be differentiated in the various figures and the text of the EIS. Also, Kaelepulu Elementary School will be identified on this and other appropriate maps.
3. Page I-6. As indicated in the previous paragraph, the general planned extension of Ulumanu Drive will be treated as a separate entity aside from the State second access road to the high school.

The proposed realignment of the general planned Ulumanu Drive connection from Keolu Drive loop to Kalaniana'ole Highway via Akiohala Street and across the Hawaii Youth

Mr. Rikio Nishioka
Page 2
June 21, 1977

Correctional Facility was referred to the Department of Transportation Services for evaluation and comments. Your letter, however, did not mention whether the Department of Land and Natural Resources (DLNR) and the Department of Social Services and Housing (DSSH) have acted upon the 1973 draft master plan report for the correctional facility and have approved the realignment of the proposed road through State lands. If the proposed realignment was satisfactory to DLNR and DSSH, it would have been customary for the lead agency to initiate a general plan amendment. We are not aware whether this action was taken.

In their letter of comments (June 15, 1977) on the subject EIS Preparation Notice, DLNR made no mention of the proposed realignment of the roadway through State lands. To avoid further delays, however, in evaluating potential alternative alignments for this proposed project, we will communicate directly to DLNR and DSSH to obtain their views on the proposed realignment.

4. Page II-16. The responsibility of planning and construction of the Ulumanu Drive extension across Kailua High School is the responsibility of the City and County. If, however, the proposed State realignment is adopted in the proposed Development Plan, it would be appropriate for the State to assume these responsibilities inasmuch as the realignment will be located almost exclusively on State lands and the State will be acting in the role of a subdivider.
5. Page III-6. This portion will be revised.
6. Page III-20. The extension of Ulumanu Drive through Kailua High School will probably increase noise level and air pollution concentration in the school. These impacts will be evaluated.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

WM:nj

cc: Division of Engineering

7704322

GEORGE R. ARIYOSHI
GOVERNOR



RECEIVED
DEPT. OF PUBLIC WORKS

RICHARD E. MARLAND, PH.D.
DIRECTOR

JUN 7 7 31 AM '77

TELEPHONE NO.
548-6915

TO ENVU
Engreg (cy)

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

June 3, 1977

Wallace Miyahira, Director
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii 96813

SUBJECT: Environmental Impact Statement Preparation Notice for
the Proposed Improvements of Hamakua Drive and Related
Streets Serving the Keolu-Enchanted Lake Area, Kailua,
Koolaupoko, Oahu, Hawaii

Dear Mr. Miyahira:

We appreciate the opportunity to comment on the subject
EIS Preparation Notice. Unfortunately, we cannot accommodate
every request we receive. We will be happy to comment on the
environmental impact statement when it is filed with the Environ-
mental Quality Commission.

Sincerely,

Richard E. Marland
Director

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-379

June 20, 1977

Office of Environmental Quality Commission
State of Hawaii
555 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Your Letter of June 3, 1977 Responding
to the EIS Preparation Notice for the
Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Hawaii

Comments in the subject letter are acknowledged.

Very truly yours,

Handwritten signature of Wallace Miyahira in cursive script.

W WALLACE MIYAHIRA
Director and Chief Engineer

WM:nj

cc: Division of Engineering

7704401

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

H BERETANIA

HONOLULU, HAWAII 96813



DEPT. OF PUBLIC WORKS

JUN 8 1 52 PM '77

TO June 1, 1977 ENV (ll)
Eng (ll)

- FRANK F. FASI, Mayor
- YOSHIE H. FUJINAKA, Chairman
- STANLEY S. TAKAHASHI, Vice Chairman
- ROYZO HAYASHIDA
- EDWARD F. C. LAU
- TERESITA R. JUBINSKY
- E. ALVEY WRIGHT
- Wallace S. Miyahira
- Fred Dailey
- EDWARD Y. HIRATA
Manager and Chief Engineer

Mr. Wallace Miyahira
 Director and Chief Engineer
 Department of Public Works
 City and County of Honolulu
 650 So. King Street
 Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Your Letter of May 18, 1977, Regarding
 Environmental Impact Statement Preparation Notice
 for the Proposed Improvements of Hamakua Drive
 and Related Streets Serving the Keolu-Enchanted
 Lake Area, Kailua

We do not anticipate any adverse effects to potable groundwater resources from the proposed projects. However, we request that all construction plans be submitted to us for review. Also, the road extension of Ulumanu Drive from Kailua High School to Akipola Street should provide for the installation of fire hydrants. Any water system improvement should be at the project's expense.

Our departmental contact is Lawrence Whang at 548-5221.

Very truly yours,

 Edward Y. Hirata
 Manager and Chief Engineer

EW

EW 77-265

June 9, 1977

Mr. Edward Y. Hirata
Manager and Chief Engineer
Board of Water Supply
630 S. Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Subject: Your Letter of June 1, 1977,
Responding to the EIS Preparation
Notice for the Proposed Improvements
of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area,
Kailua, Hawaii

Construction plans for the proposed projects will be submitted to your office for review at the appropriate time. Your concern regarding the installation of fire hydrants along the Second Access Road to Kailua High School has been directed to the State Department of Accounting and General Services, who now is responsible for that project.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

cc: Div. of Engineering

ENV

ENV 77-266

June 9, 1977

Mr. Hideo Murakami, Comptroller
Office of the Comptroller
Department of Accounting and
General Services
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Murakami:

Subject: Second Access Road to Kailua High School

We received the attached letter dated June 1, 1977, from the Board of Water Supply (BWS) commenting on the need of providing fire hydrants on the proposed second access road to Kailua High School from Akipola Street. Since this project is now under your jurisdiction, we request that you address the BWS concern by responding to them directly.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

cc: BWS (Attn: Larry Whang)
Div. of Engineering



7709184

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
RECEIVED
DEPT. OF PUBLIC WORKS

FRANK F. FASI
MAYOR



JUN 1 10 57 AM '77
TO ENV 14

ROBERT R. WAY
CHIEF PLANNING OFFICER

Engry (cy)
DGP5/77-1289 (CT)

May 31, 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Miyahira:

EIS Preparation Notice - Proposed Improvements of
Hamakua Drive and Related Streets Serving the
Enchanted Lake Area
Comments Requested May 16, 1977 - DPW Ref. No. ENV 77-238

We offer the following comments:

1. Overall Review. Your review of areawide street improvements in one EIS rather than separate EIS's for each individual project is commendable. We prefer this to the piecemeal approach.
2. The Need for Improvements. The EIS should focus on the need for the projects, particularly the need for the Hamakua Drive extension across Kaelepulu Stream.

The 1959 recommendations for the Enchanted Lake circulation system were not based on any analyses of traffic data; there were none. The proposals were simply conceptual - providing for a collector road around the pond and radials off this connector to Kalaniana'ole Highway, to the high school (at that time an intermediate school under construction), and to Kailua town (two alternate routes). The 1959 study called for a limited shopping area in Enchanted Lakes; hence, the need for an alternate route to Kailua town for shopping.

Subsequently, a second access to Kailua town was provided at a developer's own expense in anticipation of rezoning of additional land for commercial use at Awakea and Kailua Roads,

but this rezoning was not granted. Also, a larger area was rezoned for commercial use in Enchanted Lakes.

Because of its cost and the potential loss of wildlife habitat for endangered species, the need for a third access (Hamakua Drive) to Kailua town should be documented in the EIS.

3. Traffic Assignments. Traffic assignments for 1971 and 1995 are shown in the EIS preparation notice (pp. III-10 to III-11). These are outdated.

The EIS should provide 1977 traffic counts and new projections of future traffic. Average Daily Traffic (ADT) should be translated to peak hour volumes and the number of moving traffic lanes required on the various major streets. This would provide an easier understanding of the problem. As a measure of congestion, it might be well to indicate what present traffic is in relation to "practical capacity."

It is our understanding that the Department of Transportation Services is now studying this, and that they will provide projections under the various network assumptions.

4. Land Use Data. The EIS should provide land use, housing and population data for the Enchanted Lake area, existing as well as proposed. These have a relationship to projected traffic. The EIS should show what lands are already developed, and what lands remain to be developed and their General Plan and zoning designations.

These data may be obtained from the Data Systems Branch of the Department of General Planning (Mr. Rory Hahn, Ext. 4403).

5. Population Growth. The EIS preparation notice indicates: "The most dramatic population increase took place between 1960 and 1970 after the Pali and the Likelike highways were completed." (P. II-2.) This may be true for the Enchanted Lake area, but it is not true for the Koolaupoko District, the Kailua area, or Kailua town. Growth in the 1950's was greater than in the 1960's. Growth in the 1970's will be considerably less, because most of the developable lands have already been developed.

6. Socio-economic Characteristics. This section of the EIS should include data relevant to the traffic problem. This should include information on car ownership, families with

both husband and wife working, persons of school age, and school enrollment.

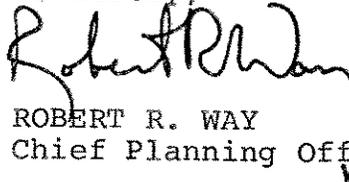
The EIS should discuss trends as well as projections of school enrollment, particularly the high school, since traffic to the high school is part of the problem. The EIS should indicate how many high school students are from the Enchanted Lake area, and this should be projected.

7. Hamakua Drive Impacts. The EIS preparation notice indicates that the extension of Hamakua Drive could have adverse impacts on the ancient habitation site as well as the habitat for wildlife. The EIS should discuss the alternative of not building this extension (see item 2 above) and, should the decision be made to go ahead with construction, the possibility of downzoning to State Land Use Conservation or CZC Preservation, or State or Federal purchase of the abutting lands. The EIS should include the Department of Land and Natural Resources' positions on these.
8. Ulumanu Drive. The EIS preparation notice indicates that Ulumanu Drive will be extended to the Kailua High School boundary. The Department of Transportation Services should be asked to include the impact of this in their traffic study.
9. Costs. Costs are indicated for the various individual project elements - Kailua Road, Hamakua Drive, Wanaao Drive improvements, and for various right-of-way widths.

The EIS should provide a summary table showing costs of various network configurations and the major impacts. The recommended network configuration should be indicated.

Appropriations by the State Legislature are shown on page II-15 of the EIS preparation notice. The EIS should indicate when these will lapse.

Sincerely,



ROBERT R. WAY
Chief Planning Officer

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-378

June 20, 1977

MEMORANDUM

TO : MR. ROBERT R. WAY, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: YOUR LETTER DGP5/77-1289(CT) OF MAY 31, 1977
RESPONDING TO THE EIS PREPARATION NOTICE FOR
THE PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE AND
RELATED STREETS SERVING THE KEOLU-ENCHANTED LAKE
AREA, KAILUA, HAWAII

We are responding to your comments on the subject project in the same order as they were presented. Your in-depth review of the preparation notice was helpful and appreciated.

1. Overall Review. Analysis of areawide street improvements in one EIS is a requirement. However, the common method is a piecemeal approach.
2. The Need for Improvements. The EIS will focus on the needs for the proposed road projects especially Hamakua Drive since, as you stated, it could result in the potential loss of wild-life habitat for endangered waterbird species. In terms of documentation, we would like to state for the record that future Development Plan's Right-of-Way (ROW) width for existing and proposed major streets should be based on traffic data and circulation needs prior to their adoption. The past practices of adopting ROW widths by "rule of thumb" and concept are unsatisfactory to Department of Public Works, the agency responsible for implementing street improvement projects.

3. Traffic Assignments. Traffic assignments are in the process of being revised by the Department of Transportation Services (DTS).
4. Land Use Data. The latest land use data will be used in developing projected traffic assignments. Mr. Rory Hahn of your office will be obtaining the data for DTS and this office.
5. Population Growth. According to the data which was furnished by your office, the most dramatic population increase for Kailua occurred between 1950 and 1960 instead of between 1960 and 1970 as stated in the preparation notice.
6. Socio-economic Characteristics. Characteristics which are available and pertinent to the project will be included in the EIS. School enrollments as projected by the State Department of Education will be included in the EIS. The number of students attending Kailua High School from Keolu-Enchanted Lake will be estimated.
7. Hamakua Drive Impacts. The "no action" and other viable alternatives are being evaluated for the proposed Hamakua Drive connection. We have written to the State Division of Fish and Game and the United States Fish and Wildlife Services regarding the possibility of State or Federal purchase of the marsh and/or downzoning the marsh to State Land Use Conservation or CZC Preservation. Their responses will be made available to your office.
8. Ulumanu Drive. Traffic assignment for the General Planned extension of Ulumanu Drive across Kailua High School to Keolu Drive loop will be prepared by DTS. The State Department of Accounting and General Services (DAGS) through its State Public Works Engineer has informed us that the two-lane road from the end of the existing Akiohala Street to the boundary of Kailua High School should be considered as a temporary road. DAGS also informed us that they favor the proposed realignment of the General Planned road from Keolu Drive across State lands to Kalaniana'ole Highway in place of bisecting Kailua High School and connecting to Kailua Road. DTS has been requested to evaluate and comment on the State's proposed realignment of the General Planned road.

Mr. Robert Way

Page 3

9. Costs. A summary table showing costs of various network configurations and major impacts will be included in the EIS. Lapsing dates for State appropriations for the various projects will also be included.

Wallace Miyahira

WALLACE MIYAHIRA

Director and Chief Engineer

cc: Div. of Engineering

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-306

July 13, 1977

MEMORANDUM

TO : MR. ROBERT R. WAY, CHIEF PLANNING OFFICER
FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
SUBJECT: DOWN-ZONING OF ABUTTING LANDS OF THE
PROPOSED HAMAKUA DRIVE IMPROVEMENTS

With respect to Comment No. 7 of your letter DGP 5/77-1289(CT), dated May 31, 1977, we have received a response from State Division of Fish and Game who wholeheartedly agreed with the concept of government purchase or the down-zoning of the abutting lands surrounding the proposed road improvements. The State's letter is attached.

Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

cc: Dept. of Transportation Services w/attach.
Div. of Engineering

Em

ENV 77-401

July 20, 1977

MEMORANDUM

TO : MR. ROBERT R. WAY, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: DOWN-ZONING OF ABUTTING LANDS OF THE PROPOSED
HAMAKUA DRIVE IMPROVEMENTS

With respect to comment No. 7 of your letter DGP 5/77-1239 (CT), dated May 31, 1977, we have received a response from the Office of Endangered Species, U. S. Fish and Wildlife Service, by letter dated July 18, 1977 (attached). We now have on record, both Federal and State agencies, responsible for the protection of endangered species, who will support the down-zoning of the abutting lands surrounding the proposed road improvements.

Plans to acquire the marsh as a wildlife sanctuary by either the Federal or State governments do not appear to be promising judging from the Federal and State responses. However, according to the Fish and Wildlife Service, "All levels of government have a responsibility to see that such areas are not destroyed." Any proposal to down-zone the abutting marsh to State Land Use Conservation or CZM Preservation must be undertaken by others, since this action is outside our area of responsibility.

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

cc: Dept. of Transportation Services
Div. of Engineering

7704578

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED
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Egry (ey)

GEORGE S. MORIGUCHI
DIRECTOR

LU5/77-1818 (GN)

ENV 77-340

June 16, 1977

FRANK F. FASI
MAYOR

MEMORANDUM

TO : MR. WALLACE MIYAHIRA, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : GEORGE S. MORIGUCHI, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
FOR THE PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE KEOLU-ENCHANTED
LAKE AREA, KAILUA, KOOLAUPOKO, HAWAII

We have reviewed the above and find portions of the project within the Special Management Area established by Ordinance No. 4529. A Shoreline Management Permit will have to be issued by the City Council prior to the start of construction.

There are no further comments we wish to make at this time. However, we would appreciate the opportunity to review the completed Environmental Impact Statement.

George S. Moriguchi
GEORGE S. MORIGUCHI
Director of Land Utilization

GSM:ey

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



ANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-374

June 17, 1977

MEMORANDUM

TO : MR. GEORGE MORIGUCHI, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
FOR THE PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE
AND RELATED STREETS SERVING THE KEOLU-ENCHANTED
LAKE AREA, KAILUA, KOOLAUPOKO, HAWAII (LU5/77-1818(GN))

Your comments on the subject document are acknowledged. A request for a Shoreline Management Permit will be submitted to your office at the appropriate time.


WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

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JUN 27 3 26 PM '77

ENV CL
Engrg (g)

KAZU HAYASHIDA
DIRECTOR

TE5/77-2374

FRANK F. FASI
MAYOR

June 27, 1977

MEMORANDUM

TO : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : KAZU HAYASHIDA, DIRECTOR

SUBJECT: REVIEW OF EIS PREPARATION NOTICE FOR THE PROPOSED
IMPROVEMENTS OF HAMAKUA DRIVE AND RELATED STREETS
SERVING THE KEOLU-ENCHANTED LAKE AREA (ENV 77-340)

We have reviewed the subject Environmental Impact Statement Preparation Notice and offer the following comments:

Page III-10: Comparison on the total number of auto trips generated by Census Tract 111 - The 10,445 auto trips in 1960 represented internal trips only (Census Tracts 101 through 113) while the 21,285 trips in 1971 represented internal plus trips to the rest of Oahu. The internal trips in 1971 totaled 15,741.

Our analyses of current traffic data have indicated a need to review and reevaluate the traffic assignments prepared by the City's consultant, and presented "in toto" on page III-11 of this preparation notice. Findings from our review will, in most likelihood, require adjustments to the 1995 traffic assignments.

Finalization of our traffic assignments will be completed and forwarded as soon as those pertinent data necessary for our evaluation have been collected.

A handwritten signature in dark ink, appearing to read "Kazu Hayashida", is written over a horizontal line.

KAZU HAYASHIDA
Director

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WALLACE MIYAHIRA

DIRECTOR AND CHIEF ENGINEER

ENV 77-391

June 28, 1977

MEMORANDUM

TO : MR. KAZU HAYASHIDA, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF JUNE 27, 1977 (TE5/77-2374)
RESPONDING TO THE EIS PREPARATION NOTICE FOR
THE PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE AND
RELATED STREETS SERVING THE KEOLU-ENCHANTED
LAKE AREA, KAILUA, HAWAII

Your comments on the subject document are acknowledged. The total number of auto trips generated by Census Tract 111 in 1960 is estimated to be about 15,300 ADT instead of 10,445 as stated.

A handwritten signature in cursive script, appearing to read "W. Miyahira".

for WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

June 3, 1977

MEMORANDUM

TO: MR. YOUNG SUK KO, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM: WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE AND
RELATED STREETS SERVING THE KEOLU-ENCHANTED
LAKE AREA, KAILUA, KOOLAUPOKO, HAWAII

An inquiry has been received from the U.S. Coast Guard regarding the existing and proposed recreational uses of Kawainui (Kaelepulu) Stream. The Coast Guard's interest is in respect to the potential navigation clearance requirements of the proposed Hamakua Drive bridge over the stream for boating activities. The present clearances of the existing bridges over the stream at Wanaao Road and Ka Awakea Road are 6 feet and 3 feet, respectively (soffit elevation to mean sea level).

Any information you can provide us will be appreciated. An appropriate map is attached.

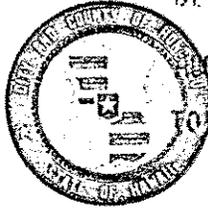
Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

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DEPT OF PUBLIC WORKS



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Engg (y)

110017
YOUNG SUK KO
DIRECTOR

HANK F. FASI
MAYOR

August 9, 1977

MEMORANDUM

TO : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : YOUNG SUK KO, DIRECTOR

SUBJECT: HAMAKUA DRIVE IMPROVEMENTS

In regard to your inquiry on the desired clearance for the proposed Hamakua Drive bridge, our cursory study indicates a good potential for canoeing activities in Kaelepulu Stream in the subject area. We therefore recommend that a minimum 6 feet clearance be planned under this bridge.

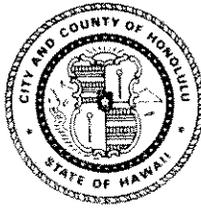
Young Suk Ko
YOUNG SUK KO, DIRECTOR

7704993

KAILUA NEIGHBORHOOD BOARD NO. 31

P. O. BOX 937
Kailua ~~PERNICK~~, HAWAII 96734

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DEPT OF PUBLIC WORKS



JUL 1 11 52 AM '77
TO _____
ENV (ll)
Engy (aj)

June 28, 1977

Mr Wallace Miyahira
Director
Department of Public Works
City and County of Hawaii

Re: Environmental Impact Statement, Hamakua
Drive and Related Streets

Dear Mr Miyahira:

At the regular meeting of Kailua Neighborhood Board No 31 of 8 June, 1977 the E.I.S. was referred to the Transportation Committee who then studied and discussed this document.

It is the consensus of the Transportation Committee that the improvements as proposed in the E.I.S. are necessary and should be implemented as soon as funding is available.

This item is one of our highest C.I.P. priorities.

Very truly yours
Arthur F. Besant
Arthur F. Besant
Chairman, Transportation Committee
Kailua Neighborhood Board-31

ENV 77-398

July 5, 1977

Mr. Arthur F. Beaumont
Chairman, Transportation Committee
Kailua Neighborhood Board No. 31
P. O. Box 937
Kailua, Hawaii 96734

Dear Mr. Beaumont:

Subject: Your Letter of June 28, 1977 Responding
to the EIS Preparation Notice of the
Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Hawaii

Comments in the subject letter are acknowledged.

Very truly yours,


for WALLACE MIYAHIRA
Director and Chief Engineer

cc: Divl of Engineering

77 05628

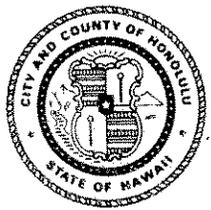
KAILUA NEIGHBORHOOD BOARD NO. 31

P. O. BOX 937
HONOLULU, HAWAII 96734

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TO _____
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July 28, 1977

Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention: Wallace Miyahira

Re: Connection of Enchanted Lakes Traffic
Through Pohakupu Area

Gentlemen and Ladies:

We have been advised that the Department of Public Works and the State are considering constructing a highway from Enchanted Lakes through the Kailua High School grounds to either Kalaniana'ole Highway or Pali Highway in the vicinity of Pohakupu. As this matter is of great concern to the residents of Kailua, we would appreciate an immediate briefing on the matters under consideration so that we may ascertain the public sentiments regarding same.

For your information, we anticipate concern by the Pohakupu residents, who formed their community association last year as a result of the heavy traffic on existing Pohakupu roads.

In serving on the Kawaihoa (Olomana) Task Force, I recall that the Task Force's recommendations in this regard were based upon the existence of an intermediate school, which is not now under consideration. If you have any further information on this subject, please add same on the construction proposals.

Department of Public Works
Page 2
July 28, 1977

We look forward to hearing from you at the earliest possible date. If you have any further questions or comments, please contact either myself at 531-8031 or our Transportation Chairman, Art Beaumont at 471-8147.

Very truly yours,



Kenneth R. Kupchak
Chairman, Kailua Neighborhood
Board

KRK:eam
cc: Neighborhood Commission
Mr. Art Beaumont
Windward legislators
Windward councilmen
SunPress
Windword

August 10, 1977

Mr. Kenneth R. Kupchak
Chairman
Kailua Neighborhood Board No. 31
P. O. Box 937
Kailua, Hawaii 96734

Dear Mr. Kupchak:

Subject: Extension of Ulumanu Drive from
Pohakupu Tract Across Kailua High
School to Keolu Drive Loop
(Your letter dated July 28, 1977)

The proposed extension of Ulumanu Drive across Kailua High School to Enchanted Lake is in the same category as the proposed connection of Hamakua Drive between Hahani Street and Akoakoa Street. Both projects are general planned road accesses into the Keolu-Enchanted Lake area and are fully described in the EIS Preparation Notice for the proposed improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area. Neighborhood Board No. 31 was requested by letter dated May 18, 1977, to comment on the general planned road accesses into Keolu-Enchanted Lake.

Your Board, by letter dated June 28, 1977, commented on the needs and priorities of the improvements without going into any details. No substantive comments were made on the alignment, right-of-way width, endangered waterbird species in the Kaelepulu marsh, financing methods, etc., on the proposed improvements of Hamakua Drive, Kailua Road, Wanaao Road and Ulumanu Drive.

In addition to Neighborhood Board No. 31, we requested, concurrently, comments from the Kailua community groups including Kailua Chamber of Commerce, Lani-Kailua Outdoor Circle, Olomana Community Association, Kailua Community Council, and Pohakupu Community Association. To date, none of the listed groups have responded to any aspects of the proposed improvements. No comments were received from the Pohakupu Community Association with respect to the proposed extension of Ulumanu Drive to Keolu Drive loop via Kailua High School and Akiohala Street.

615-113

August 10, 1977

By letter dated June 14, 1977, the State Department of Accounting and General Services (DAGS) informed us that the two-laned second access road to Kailua High School which will begin from the existing Akiohala Street and terminates in a cul-de-sac (dead end) at the boundary of the school should be considered a temporary road, open only during school hours and special school activities. DAGS and the Department of Education are not in favor of the extension of Ulumanu Drive across Kailua High School since it will bisect the school ground and increase noise pollution and traffic congestion in Pohakupu Tract.

DAGS also made reference to a report for the Hawaii Youth Correctional Facility, prepared for the State Department of Land and Natural Resources (DLNR) by Hawaii Architects and Engineers, Inc., that proposed the realignment of the County general planned road from Keolu Drive loop to Kalaniana'ole Highway via Akiohala Street and across the Youth Correction facility grounds. The attached location map will show the approximate location of the proposed realigned route.

As a follow up, we consulted with DLNR and the State Department of Social Services and Housing (DSSH) to solicit their views. DLNR responded by letter dated July 13, 1977, stating that the consultant's report was accepted by the Board of Land and Natural Resources on November 1973; however, a General Plan amendment was not contemplated for the proposed realignment, nor was State funding available or programmed for the project. Also, the proposed realignment would impact on an existing correction facility and cause some disruption. DSSH has not responded to our inquiry yet.

Representatives John J. Medeiros and Faith P. Evans have contacted this office to express their concerns on the proposed general planned alignment of Ulumanu Drive. They have been informed that the City and the State have no plans to implement the construction of Ulumanu Drive now and in the foreseeable future.

If you have any further questions concerning the general planned access roads serving Keolu-Enchanted Lake, you may call Mr. Chew Lun Lau at 523-4150.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

bcc: Div. of Engineering

RECEIVED
DEPT. OF PUBLIC WORKS

JUN 28 3 03 PM '77

to ENV
of Hawaii

Enzy (cy)

AMERICAN  LUNG ASSOCIATION

June 27, 1977

Mr. Wallace Miyahira, Director
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: EIS Preparation Notice for the Proposed
Improvements of Hamakua Drive and Related
Streets Serving the Keolu-Enchanted Lake Area

We have reviewed and concur with your proposed methodology for
assessing the air quality impact of the proposed improvements.

Sincerely,

James W. Morrow/ct

James W. Morrow, Director
Environmental Health

JWM:ct

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

ENV

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-393

June 29, 1977

Mr. James W. Morrow, Director
Environmental Health
American Lung Association
245 Kukui Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

Subject: Your Letter of June 27, 1977, Responding to
the EIS Preparation Notice for the Proposed
Improvements of Hamakua Drive and Related
Streets Serving the Keolu-Enchanted-Lake
Area, Kailua, Hawaii

Comments in the subject letter are acknowledged.

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. Miyahira".

WALLACE MIYAHIRA
Director and Chief Engineer

cc: Div. of Engineering

Pohakupu

RECEIVED
DEPT. OF PUBLIC WORKS

Community Association

August 15, 1977

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DEP
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Mr. Wallace S. Miyahira
Director & Chief Engineer
Department of Public Works
City and County of Honolulu
650 King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

The Pohakupu Community Association has reviewed the Environmental Impact Statement Preparation Notice for the proposed improvements of Hamakua Drive and related streets serving the Keolu/Enchanted Lakes area, Kailua, Koolaupolo, Oahu, Hawaii , Tax Key 4-5-39,76; 4-2-01 and 4-2-52,39.

The Pohakupu Community Association wishes to go on record as opposing the statement on page I/6 under E, "Ulumanu Drive Improvements - The proposed improvements of Ulumanu Drive from Kailua High School to Keolu Drive from Kailua High School to Keolu Drive by way of Akiohala Street at Akipola Street..." "the improvements will include curbs, gutters, sidewalks and storm drains...etc.", and on page III/6 under 4, "Other improvements. In this category other improvements will include the proposed extension of Ulumanu Drive to Keolu Drive Loop through Kailua High School...".

One of the major problems confronting our community association is the traffic created by the high school, which must go through the development. Unfortunately, the high school traffic does not contain itself to Ulumanu Drive or Ulupii Street (which should be the only "feeder" streets to the high school), but careens and races through the whole development, trying to beat the already heavy existing traffic on these two streets, notably at arrival and dismissal time of the regular school day. This situation has already resulted in two children being run over on a sidewalk area in late fall 1976.

Our development is not built to handle any excessive traffic. The roads were originally designed for Pohakupu only. When the high school was placed so far away from a major access road, our streets were "borrowed". Now the high school has grown so considerably and there is still no proper access to the school.

Our Association will strongly oppose any and all requests to funnel traffic through our development as an outlet from Enchanted Lakes. The City and County has just put in "foot paths" on Ulumanu Drive, which is helpful for the students, but to tear that down to provide sidewalks, curbs, gutters, and storm drains, plus widening the road, is unacceptable.

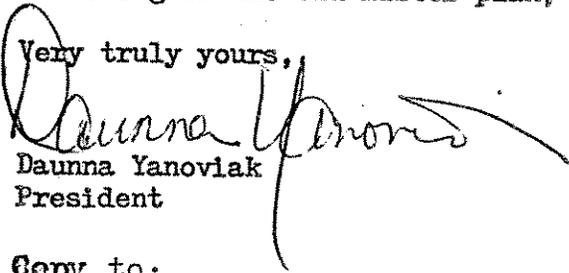
We would prefer a separate road from either Kailua Road or Kalaniana'ole Highway that would service the Kailua High School exclusively so that no traffic would have to go through the development. Our Traffic Committee is searching for an alternate route. We will not tolerate an extra amount of traffic through our community. Our community is small enough to go around and large enough to oppose any through road.

Mr. Wallace S. Miyahira

August 15, 1977

We appreciate the extension you have given us, through the request of our Representative Faith Evans, to again review and add our comments to the proposed EIS statements. Our Board's initial review of the EIS in early June found the EIS to be in order because of the statement...."that the extension of Akiobala Street will end in a cul de sac." However, in the case of any revised planning, or the following of the old master plan, we do wish to make our stand clear.

Very truly yours,


Daunna Yanoviak
President

Copy to:

Rep. Faith Evans
Mr. Ken Kupchak
Mr. Kengo Takata
Mr. Andrew Chang
Mr. E. Alvy Wright

Pohakupu Community Association

August 11, 1977

Mr. Ken Kupchak,
Chairman, Neighborhood Board
Kailua, Hawaii

Dear Ken:

Enclosed is a copy of a letter the PCA has sent to Mr. Miyahira concerning the EIS proposal about the improvements of Hamakua Drive and related streets. I am sending you a copy because I believe your Board can help us in this endeavor. In reading your minutes of the Board's special meeting July 27, 1977, you state that (12), "The Chairman announced that the City and State were involved in discussions regarding completing the road from Enchanted Lakes through the high school and either the Boys' School or Pohakupu to either ~~to either~~ Pali Highway or Kalaniana'ole Highway. He noted that he had requested information from appropriate agencies and would present same in the future. Members from the affected districts should contact their communities for reaction". Since that time I have had discussions on the matter with Mary Campbell and Rep. Faith Evans. We would like the Neighborhood Board to know our position, the reasons for that position and would like to request your help in supporting us in this matter.

(1) We are opposed to any through street road, or way, even limited access, from any street in Pohakupu to or from Keolu Drive or Akiohala Street to any street in the Enchanted Lakes area.

(2) We will oppose any plan to open a street that does not end in a cul de sac from the Enchanted Lakes area to the high school.

Our reasons are as follows:

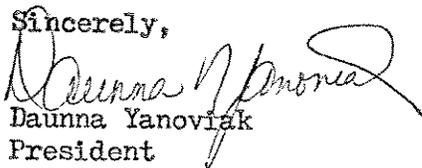
- (1) Pohakupu is the oldest development and was not built to service traffic to the high school from all of Kailua, Enchanted Lakes and Waimanalo.
- (2) Pohakupu is also not built to serve as any new route out of Enchanted Lakes, nor should we be asked to perform this service.
- (3) Our community is bound by two highways already - it would be split in two or three parts if another highway were to bisect it, thus destroying the community.
- (4) Those people living on Ulupii Street, Ulumanu Drive, Ulupihi Loop, Ununahahele Street, Uluoa Steet, Ulupuni Street, and Ulupalakua Street have enormous difficulty now in the morning and afternoon, and during special event times at the high school, entering or leaving their place of residence because of the traffic created by the high school. Imagine the impossibility of this if a street came from Enchanted Lakes through the development.
- (5) Ours is a development without sidewalks or curbs which places our residents who are walking or cycling in a precarious situation. The safety of our children and residents is a prime factor.

P.O. BOX 1475, KAILUA, HAWAII 96734

- (6) Traffic coming from a major highway into a small development road is already a hazard since it does not slow down upon entering the development. Psychologically the driver does not have time to realize he is traveling through a community, not a highway. A through road would create still another raceway entrance.
- (7) The closest route to the high school from Kailua Road is not Ulumanu Drive but the substantial area north of the development beyond Uluopihi Loop.
- (8) A through road going down Ulupii Street would completely trap the people living on that street, especially the Waimanalo side of it. A road going down Ulumanu Drive not only traps the people living on that street but also all of Uluopihi Loop.
- (9) Any through road such as Ulumanu Drive to Enchanted Lakes would not limit the traffic to that road. It would do as it does now - expanding itself to Ulupii Street, and all the other streets in the development.
- (10) The value and desirability of living in Pohakupu would decrease rapidly. Many of our residents would lose financially if this were to be permitted. As it stands now, it is a pleasant neighborhood with our two major problems being the traffic and the break-ins. We are trying to combat these two problems by, (a) requesting the high school to have their students, administrators, parents, faculty and staff please restrict their ingress/egress through Pohakupu via Ulumanu Drive and Ulupii Street only; (b) working with the Boys' Home to lessen the desirability of breakouts which result in break-ins in Pohakupu.
- (11) Our children must walk to and from Maunawili Elementary School in Olomana. It is not safe for them to walk now with the high school traffic. It would be doubly unsafe with even a portion of Enchanted Lakes traffic.
- (12) Ulumanu Street should be treated separately in its own EIS statement, not as an adjunct or small insert to the Hamakua Drive statement

I believe this gives us a starting point to oppose any action on behalf of the State or City to dissect our community with the physical presence of a through road. We would appreciate your support for the PCA to negate any existing or future action by the City or State that would propose a road through our community. We would like also to solicit your assistance in an effort to find a new exclusive access route to the high school, thereby diverting present traffic out of Pohakupu. This would be one of our major inputs to the new Kailua Development Plan.

Sincerely,


Daunna Yanoviak
President

Copy to:

Mr. Chew Lum Lau
Mr. Wallace Miyahira
Rep. Faith Evans
Mr. Kenjo Takata
Mr. Andrew Chang
Mr. E. Alvey Wright

August 26, 1977

Ms. Daunna Yanoviak, President
Pohakupu Community Association
P. O. Box 1475
Kailua, Hawaii 96734

Dear Ms. Yanoviak:

Subject: Your Letter of August 15, 1977,
Responding to the Environmental Impact
Statement Preparation Notice for the
Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Hawaii

We are responding to comments in your letter which deal exclusively with the proposed general planned extension of Ulumanu Drive to Keolu Drive loop by way of Kailua High School and Akiohala Street. This road project is not being considered for implementation at this time as the prime effort is to implement the design and construction of the Hamakua Drive connection. However, the EIS will be considering the general planned access roads into Keolu-Enchanted Lake as a single action since they represent a series of alternative traffic network system. To do otherwise would be taking a piecemeal approach to the traffic problems of the area.

The objections of the Pohakupu Community Association to the proposed general planned alignment through Kailua High School are acknowledged. The community's concerns are similar to those that were expressed previously in the late 1950's and 1960's when a second access road to Kailua High School was being sought. The Public Works Department has no plans to implement this project inasmuch as it is not listed in the current Six-Year Capital Improvement Program.

A second access road to Kailua High School is being constructed during this summer by the State Department of Accounting and General Services. This road will terminate in a cul-de-sac (dead end) at the school boundary and be opened only during school hours

Ms. Daunna Yanoviak

- 2 -

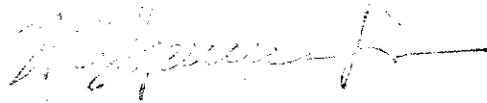
August 26, 1977

and special school activities. This State road, although called temporary, can be considered permanent for all practical reasons since there are no known agencies that are planning to implement any further extension of the road under the present general planned alignment.

With respect to an alternative alignment of the general planned road, there is a State proposal to realign the road from Keolu Drive loop to Kalaniana'ole Highway via Akiohala Street and across the Hawaii Youth Correctional Facility as shown on the attached map. The State Department of Land and Natural Resources has informed us that a General Plan amendment was not contemplated for the proposed realignment, nor was State funding available or programmed for the project.

If you have any further questions concerning the general planned access roads serving Keolu-Enchanted Lake, you may call Mr. Chew Lun Lau at 523-4150. We appreciate your interest in projects affecting your community.

Very truly yours,



FOR WALLACE MIYAHIRA
Director and Chief Engineer

Attach.

cc: Dept. of Transportation
Services (w/PCA Letter)
Div. of Engineering

XIV. SUMMARY OF UNRESOLVED ISSUES

The matter of down-zoning the marsh abutting the Hamakua Drive connection to State Land Use Conservation or CZM Preservation can be considered an unresolved issue. The State Fish and Game Division and the U.S. Fish and Wildlife Service were contacted after the formal EIS consultation period to obtain their views. Both agencies stated that they had no plans to purchase the marsh as a wildlife preserve, however, they would support down-zoning the marsh.

The views of the Federal and State wildlife agencies were transmitted to the Department of General Planning who first raised the question of State and Federal purchase of the abutting marsh or the possibility of down-zoning. The question of down-zoning the marsh was not discussed with the land owner(s) of the marsh, inasmuch as the Department of Public Works is not responsible for the implementation of down-zoning activities. The land owners requested to be consulted parties during the formal EIS consultation period; however, no comments were received from them.

②

③

XV. PERMITS AND APPROVALS REQUIRED

Permits will be required from the following agencies:

1. A permit for grading, excavation and fill will be required pursuant to Ordinance No. 3968 (1972), Chapter 23, Revised Ordinances of Honolulu, 1969, as amended. The Contractor will obtain said permit from the Department of Public Works.
2. A U.S. Department of Army permit under Section 404 of the Federal Water Pollution Control Act Amendment of 1972 will be required for construction within navigable waters for the proposed bridge and drain outlets. The application for the permit(s) will be submitted after the acceptance of the EIS and assured funding for the various projects.
3. A special management permit pursuant to Section 7, Ordinance No. 4529, and Chapter 205-A HRS as amended by Act 176, SLH 1975, "Interim Shoreline Protection District for Oahu," will be required from the Honolulu City Council through the Department of Land Utilization. The application for the permit will be submitted after the acceptance of the EIS.
4. An application for a Conditional Use Permit for Construction Activities under Chapter 44B, Community Noise Control for Oahu, of the Public Health Regulations. The contractor will obtain said permit from the Department of Health.



XVI. COMMENTS ON THE EIS

Included in this section are letters and memorandum received during the public review period and our responses thereto. No responses were prepared for letters with no comments.

Federal Agencies:

Department of the Air Force¹ (1/5/78)
Fourteenth Coast Guard District (12/9/77)
Fourteenth Naval District¹ (12/14/77)
U.S. Army, Directorate of Health Services¹ (12/20/78)
U.S. Army Engineer District, Honolulu (1/4/78)
United States Army Support Command, Hawaii¹ (12/9/77)
U.S.D.A., Soil Conservation Service¹ (1/4/78)
U.S.D.I., Fish and Wildlife Service (1/4/78)

State Agencies:

Department of Agriculture¹ (12/12/77)
Department of Defense¹ (12/8/77)
Department of Health (12/29/77)
Department of Land and Natural Resources (1/3/78)
Department of Planning & Economic Development (12/23/77)
Department of Transportation (12/29/77)
Environmental Center, University of Hawaii (1/20/78)
Office of Environmental Quality Control (1/10/78)
Water Resources Research Center, U.H.¹ (1/16/78)

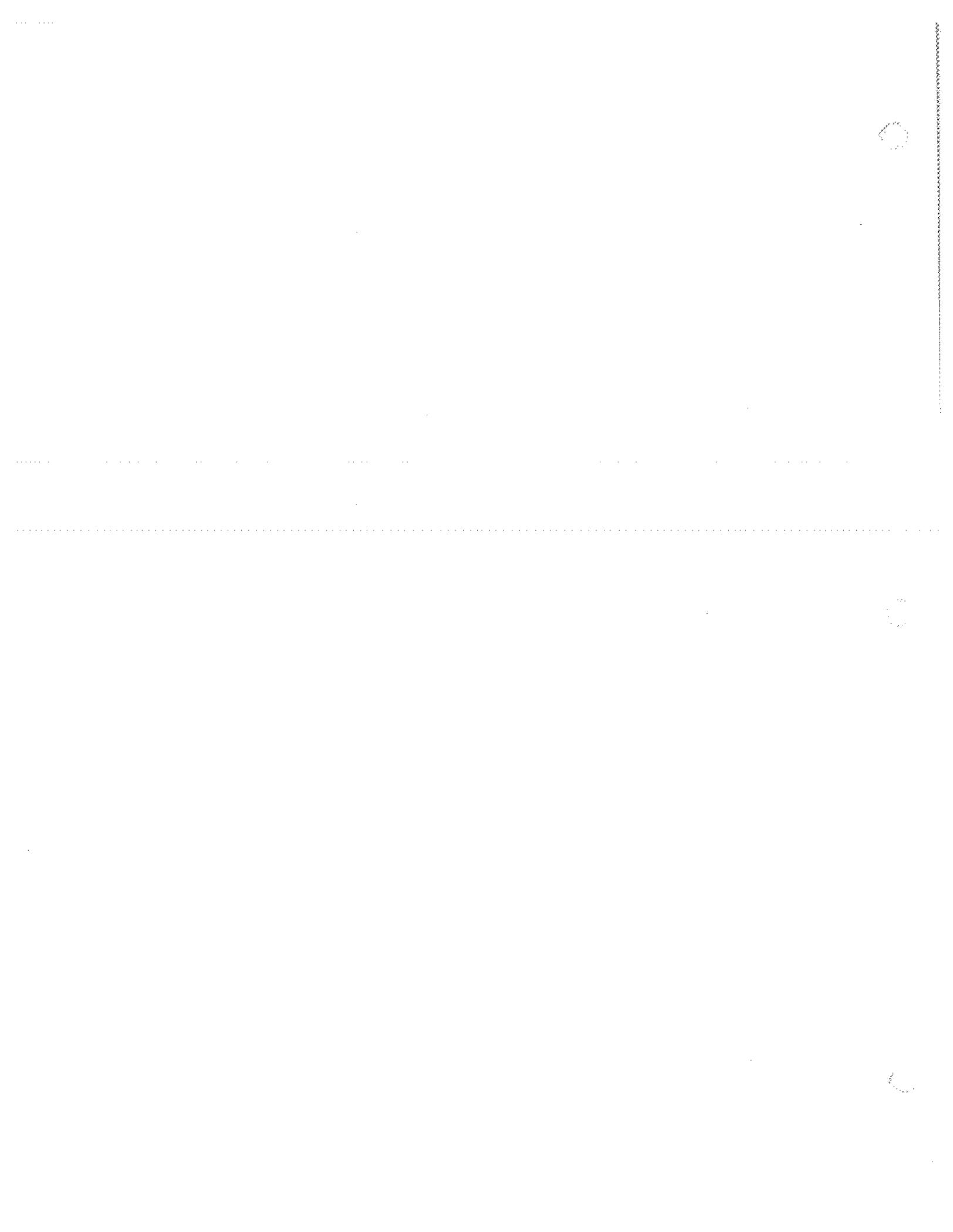
City Agencies:

Department of Housing and Community Development¹ (12/13/77)
Department of General Planning (1/23/78)
Department of Land Utilization (12/14/77)
Department of Parks and Recreation (1/18/78)
Department of Transportation Services¹ (1/6/78)
Board of Water Supply¹ (12/21/77)
Kailua Neighborhood Board No. 31 (1/10/78)

Others:

American Lung Association of Hawaii (12/13/77) (1/10/78)
Kailua Chamber of Commerce (undated)
Kailua Community Council (12/26/77)
Pohakupu Community Association (1/5/78)
Representative Andrew K. Poepoe (1/10/78)

¹ No comments.



780108

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96853

RECEIVED

DEPT OF PUBLIC WORKS

JAN 6 2 29 PM '78



ENV
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TO ~~5 JAN 1978~~

REPLY TO
ATTN OF:

DEEV (Mr. Nakashima, 449-1831)

SUBJECT:

Environmental Impact Statement (EIS) for the Proposed Improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area, Kailua, Koolaupoko, Oahu, Hawaii

TO:

Governor, State of Hawaii
(Office of Environmental Quality Control)
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

1. This office has reviewed the subject EIS and has no comment to render relative to the proposed project.
2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document.

ROBERT Q. K. CHING
Chief, Engineering, Construction
and Environmental Planning Div
Directorate of Civil Engineering

1 Atch
EIS

Cy to: Dept of Public Works
City and County of Honolulu
Honolulu Municipal Bldg
Honolulu, Hawaii 96813





DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

COMMANDER (oan)
Fourteenth Coast Guard District
Prince Kalaniana'ole Federal Bldg.
300 Ala Moana Blvd.
Honolulu, Hawaii 96850
Phone: (808) 546 7130

16475
Serial 32341

DEC 1977

State of Hawaii
Environmental Quality Commission
Office of the Governor
550 Halekauwila Street, Rm 301
Honolulu, Hawaii 96813

Dear Sir:

The Environmental Impact Statement for the Hamakua Drive and Related streets serving the Keolu-Enchanted Lake Area Project has been reviewed.

It has been determined that no Coast Guard bridge permit is necessary for this project.

The opportunity to review and comment has been appreciated.

Sincerely yours,

A. J. HAGSTROM
Captain, U. S. Coast Guard
Chief, Aids to Navigation Branch
Fourteenth Coast Guard District
By direction of the District Commander

Copy to:
Mr. Wallace Miyahira
Dept of Public Works
City & County of Honolulu
Honolulu, Hawaii 96813

ENV 77-563

December 14, 1977

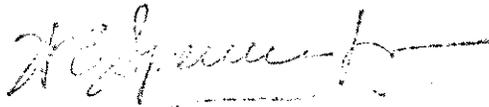
Captain A. J. Hagstrom
Fourteenth Coast Guard District
Prince Kalaniana'ole Federal Building
300 Ala Moana, 9th Floor
Honolulu, Hawaii 96850

Dear Captain Hagstrom:

Subject: Environmental Impact Statement for
the Proposed Improvements of Hamakua
Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua,
Hawaii (16475 Serial 32341)

A Coast Guard bridge permit will not be filed for this project per your letter of December 9, 1977.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
DLU
Div. of Engineering



ENV-LL

STATE OF HAWAII
ENVIRONMENTAL QUALITY COMMISSION
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

December 5, 1977

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) prepared pursuant to Chapter 343, Hawaii Revised Statutes and its Rules and Regulations:

Hamakua Drive and Related Streets Serving the
Title - Keolu-Enchanted Lake Area
Location - Kailua, Oahu
Classification - Agency Action

We would appreciate your comments or acknowledgement of no comments. Please submit one copy each to:

- 1) Accepting Authority: Governor, (Ofc. of Env. Quality Control)
Address: 550 Halekauwila Street
Room 301
Honolulu, HI 96813
- 2) Proposing Party: Dept. of Public Works
Address: City and County of Honolulu
Honolulu Municipal Building
Honolulu, HI 96813

Your comments must be received or postmarked by: January 7, 1978

If you have no future use for this document, please return the EIS to the Commission. (Comments or acknowledgement of no comments should be directed to both the accepting authority and proposing party.)

Thank you for your participation and cooperation in the EIS process!

20 December 1977

No comments.

Patricia A. Greene
PATRICIA A. GREENE
Colonel, ANC
Chief, Health and Environment Activity
Directorate of Health Services

770 9 159

HEADQUARTERS
FOURTEENTH NAVAL DISTRICT

BOX 110
PEARL HARBOR, HAWAII 96860

IN REPLY REFER TO:

002A:FWD:amn
Ser 2485

14 DEC 1977

Environmental Quality Commission
State of Hawaii, Office of the Governor
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Environmental Impact Statement for the
Proposed Improvements of Hamakua Drive and
related Streets serving the Keolu-Enchanted Lake Area

The Environmental Impact Statement for the proposed Improvements
of Hamakua Drive and related Streets serving the Keolu-
Enchanted Lake Area has been reviewed, and the Navy has no
comments. As requested by your letter of 5 December 1977,
the subject EIS is returned.

Thank you for the opportunity to review the EIS.

Sincerely,


R. P. NYSTROM
CAPTAIN, CEC, USN
DISTRICT CIVIL ENGINEER
BY DIRECTION OF THE COMMANDANT

Encl

Copy to: (w/o encl)
City and County of Honolulu
Department of Public Works

7800107



PODED-PV

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858

RECEIVED
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JAN 6 2 39 PM '78
4 January 1978

TO ENV/CL
Engg (cy 1/6)

Mr. Wallace Miyahira, Director
Department of Public Works
City and County of Honolulu
Honolulu Municipal Building
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

We have reviewed the Environmental Impact Statement for the Proposed Improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area. We feel that the document is well written and thoroughly evaluates the impacts and trade-offs associated with the proposed action and the several alternatives considered.

As stated in our letter of 28 June 1977, the Hamakua Drive crossing of Kawainui Stream and extension over a small remnant of Kaelepulu Marsh will require a Department of Army Permit. Since the processing of permit applications can be lengthy, coordination with us should be initiated in a timely manner to preclude possible delays in the proposed project.

We thank you for the opportunity to review the subject EIS.

Sincerely yours,

F. M. PENDER
Colonel, Corps of Engineers
District Engineer

Copy Furnished:

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

ENV

ENV 78-22

January 25, 1978

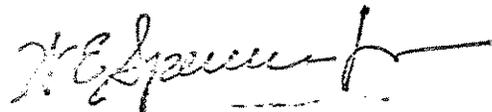
Colonel F. M. Pender
District Engineer
U. S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96358

Dear Colonel Pender:

Subject: Your Letter of January 4, 1978 (PODED-PV)
Regarding the EIS for the Proposed Improvements
of Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

Coordination with your office for a Department of Army permit will be initiated as soon as the bridge crossing design across Kawainui Stream is completed and construction funds are scheduled.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering



DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII

7709680

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TO Env Cell
(Engg/ty)

DEC 09 1977

AFZV-FE-EE

Office of the Governor
State of Hawaii
Environmental Quality Commission
550 Halekauwila St., Room 301
Honolulu, HI 96813

Gentlemen:

The Environmental Impact Statement (EIS) for the proposed improvements of Hamakua Drive and related streets serving the Keolu-Enchanted Lake area has been reviewed and we have no comments as there are no Army installations in the vicinity of the proposed projects.

The EIS is returned in accordance with your request. The opportunity to review and comment on the EIS is appreciated.

Sincerely,

Carl P. Rodolph
CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

1 Incl
as stated

CF: (w/o Incl)
Office of the Governor
State of Hawaii
Environmental Quality Control (same address)

✓ Department of Public Works,
City and County of Honolulu,
Honolulu Municipal Bldg,
Honolulu, HI 96813

7800069

**UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

P. O. Box 50004, Honolulu, HI 96850

RECEIVED
DEPT. OF PUBLIC WORKS

JAN 5 1 28 PM 1978
January 4, 1978

TO _____
ENV
Engrg (cy)

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Miyahira:

Subject: Hamakua Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua, Oahu

We have reviewed the subject environmental impact statement and have
no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,


Jack P. Kanalz
State Conservationist

cc: Office of Environmental Quality Control





United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
300 Ala Moana Blvd., Rm. 5302
P. O. Box 50167
Honolulu, Hawaii 96850

Reference: ES

January 4, 1978

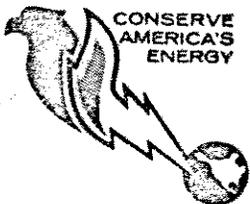
Governor's Office
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Re: Environmental Impact
Statement for Hamakua
Drive and Related
Streets Serving the
Keolu-Enchanted Lakes
Area, Kailua, Oahu

Dear Sir:

We have reviewed the referenced document as per your request dated 5 December 1977, and have no additional comments to make on its construction methodology. However, we wish to reiterate our concern over adverse secondary impacts to wetland habitat associated with the completion of Hamakua Drive. Improved access is likely to encourage development and the resulting destruction of wetlands within and adjacent to this alternative project area. Development within the flood plain probably would necessitate additional channelization of Kawainui Stream for flood protection.

In response to Executive Orders 11988 and 11990, this Service has been directed not to support floodplain development or new construction in wetlands where practicable alternatives exist. Two alternatives have been proposed which could eliminate the need for the Hamakua Drive extension, i.e. improvements of Kailua Road from Hahani Street to Wanaao-Awakea Road and improvement of Wanaao Road from Awakea Road. Therefore the Service cannot support construction of the Hamakua Drive extension at this time.



Save Energy and You Serve America!

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Destruction of wetland habitat would contribute to the cumulative loss of this resource, nationally recognized as valuable and worth conserving. We could only approve of the Hamakua Drive alternative if downzoning of remaining wetland habitat was accomplished.

Thank you for the opportunity to comment on this project.

Sincerely yours,

Maurice H. Taylor

Maurice H. Taylor
Field Supervisor

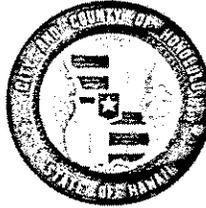
cc: HA
SE
HDF&G
NMFS

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-21

January 30, 1978

Mr. Maurice H. Taylor
Division of Ecological Services
Fish and Wildlife Service
U. S. Department of the Interior
300 Ala Moana Boulevard, Room 5302
P. O. Box 50167
Honolulu, HI 96850

Dear Mr. Taylor:

Subject: Your Letter of January 4, 1978, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

Your concern regarding the secondary effects of the Hamakua Drive connection on the adjacent Kaelepu marsh is shared by several agencies, including the State Fish and Game Division, and several City departments.

With respect to downzoning of the adjacent marsh as suggested by the Department of General Planning, the Department of Land Utilization is willing to initiate downzoning action provided the land use designation for the affected area is changed to conservation or open space either by a State's district boundary revision or the County's Detailed Land Use Map amendment. The latter can be accomplished by the amendment of the Development Plans for Kailua which is now in the process of general review.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

BOARD MEMBERS:

MEMBER - AT - LARGE

ERNEST F. MORGADO
MEMBER - AT - LARGE

Sidney Goo
MEMBER - AT - LARGE

SHIZUTO KADOTA
HAWAII MEMBER

STEPHEN Q. L. AU
KAUAI MEMBER

FRED M. OGASAWARA
MAUI MEMBER

December 12, 1977

MEMORANDUM

To: Office of Environmental Quality Control

Subject: EIS for Hamakua Drive and Related Streets
serving the Keolu-Enchanted Lake Area
Kailua, Oahu

The Department of Agriculture has no comments on the subject environmental impact statement.

The document is herewith returned for further use.

We appreciate the opportunity to comment.


JOHN FARIAS, JR.
Chairman, Board of Agriculture

cc: Department of Public Works
C&C of Honolulu

Att.

709654

GEORGE R. ARIYOSHI
GOVERNOR



RECEIVED
DEPT OF PUBLIC WORKS

VALENTINE A. SIEFERMANN
MAJOR GENERAL
ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
FORT RUGER, HONOLULU, HAWAII 96816

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Engrg (us)

08 DEC 1977

HIENG

Dept of Public Works
City and County of Honolulu
Honolulu Municipal Building
Honolulu, Hawaii 96813

Gentlemen:

Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area

Thank you for sending us a copy of the "Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area" Environmental Impact Statement. We have received the publication and have no comments to offer.

Yours truly,

WAYNE R. TOMOYASU
Captain, CE, HARNG
Contr & Engr Officer

78 00179

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



RECEIVED
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Engy (4/11)

GEORGE A. L. YUEN
DIRECTOR OF HEALTH
Audrey W. Mertz, M.D., M.P.H.
Deputy Director of Health
Henry N. Thompson, M.A.
Deputy Director of Health
James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

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

December 29, 1977

In reply, please refer to:
File: EPHS - SS

MEMORANDUM

To: Mr. Wallace Miyahira, Director and Chief Engineer
Department of Public Works, City & County of Honolulu

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Hamakua Drive and Related
Streets Serving the Keolu-Enchanted Lake Area, Kailua, Oahu

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to this project.

We submit the following comments for your information:

Noise

1. The project must comply with the provisions of Public Health Regulations, Chapter 44B, Community Noise Control for Oahu:
 - a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the regulations.
 - b. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must have a muffler.
 - c. The contractor must comply with the conditional use of permit as specified in the regulations and the conditions issued with the permit.
 - d. The contractor must comply with the requirements of limiting highway noise to 50 dBA inside any school, library, multi-purpose room, hospital or rest home already in existence.
2. Traffic noise from heavy vehicles traveling to and from construction site must be minimized in residential areas and must comply with the provisions of Public Health Regulations, Chapter 44A, Vehicular Noise Control for Oahu.

December 29, 1977

3. Noise attenuation methods must be designed to reduce the noise to residential areas which will be affected due to the increase of traffic.

Air Quality

We agree with the methodology and conclusions as they relate to the air quality evaluation.

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.



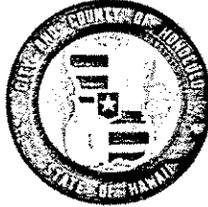
JAMES S. KUMAGAI, Ph.D.

cc: Environmental Quality Commission
Office of Environmental Quality Control

Env

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-34

January 26, 1978

Dr. James S. Kumagai
Deputy Director of Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Kumagai:

**Subject: Your Memorandum of December 29, 1977 (EPHS-SS) Regarding
the EIS for the Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-Enchanted Lake
Area, Kailua, Hawaii**

The proposed actions described in the subject EIS will comply with the provisions of PHR Chapter 44B, Community Noise Control for Oahu and Chapter 44A, Vehicular Noise Control for Oahu.

Specifically, the contractor(s) will obtain a noise permit; his equipment and vehicles will have mufflers; and he must comply with all the provisions of the noise permit. The contractor(s) will be responsible for minimizing traffic noise in residential areas from heavy vehicles in transit under his control.

The design of the streets meets the requirements of 50 dBA for highway noise within the Kailua Intermediate School's classrooms during school hours.

Noise attenuation methods will be designed in residential areas as warranted; however, none are planned at this time. Noise levels will be reduced along Kailua and Wanaao Roads if the Hamakua Drive connection is constructed.

Your statement on air quality is noted.

Very truly yours,


FOR WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

7800113

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



RECEIVED
DEPT. OF PUBLIC WORKS W. Y. THOMPSON, Chairman

JAN 9 8 49 AM '78

CHRISTOPHER COSS, CHAIRMAN

BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

TO

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621

HONOLULU, HAWAII 96809

ENV 119

DIVISIONS

CONVEYANCES

FISH AND GAME

FORESTRY

LAND MANAGEMENT

STATE PARKS

WATER AND LAND DEVELOPMENT

January 3, 1978

Honorable George R. Ariyoshi
Governor of Hawaii
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Sir:

We have reviewed the EIS for the Enchanted Lakes off-site improvements.

With respect to the proposed dredging activities associated with the Kailua Road Bridge installation across Kawainui (Kaelepulu) Stream and excavation of material along the stream's banks to accommodate a 60" drain from Kailua Road, precautionary measures should be taken to prevent any debris, petroleum products, or other construction-related materials from entering the water. Silt screens should be deployed if turbidity conditions become excessive during the dredging activities, especially since the proposed method of dredging calls for the use of a dragline dredge. An impoundment area should also be established to allow for dewatering of the dredged material before being hauled away to an approved disposal site on fast land.

Very truly yours,

W. Y. Thompson

W. Y. THOMPSON
Chairman of the Board

cc: /C&C of Honolulu
Dept. of Public Works



ENV 78-30

January 25, 1978

Mr. W. Y. Thompson
Chairman of the Board
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Thompson:

Subject: Your Letter of January 3, 1978, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

Precautionary measures as stated in the EIS will be undertaken to minimize the entry of debris, petroleum products or other construction related materials into the stream during the dredging and excavation of Kawainui Stream. Such measures will be written into the construction specifications and become legally binding on the contractor(s).

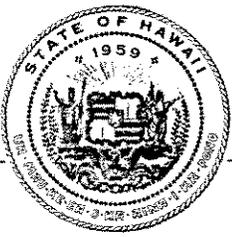
Silt screens may be deployed as stated in the EIS. Dredged material may be used as fill material for the side slopes and embankment. If they are hauled away to an approved site, dewatering of the spoils may be necessary as you suggested.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

17 09999



DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
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GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Kamamafu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

December 23, 1977

Emill
Engy (a)

Ref. No. 5280

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Environmental Impact Statement for the Proposed
Improvements of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area

We have reviewed the subject EIS and find that it has adequately identified the major environmental impacts which can be anticipated resulting from the proposed action.

We have no further comments to offer at this time but appreciate the opportunity to review and comment on this matter.

Sincerely,

Frank Skrivaneck
for HIDETO KONO

cc: Dr. Richard E. Marland, Director
Office of Environmental Quality
Control

End

ENV 78-29

January 25, 1978

Mr. Hideto Kono, Director
Department of Planning and
Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Kono:

Subject: Your Letter of December 23, 1977
(Reference No. 5280) Regarding the EIS
for the Proposed Improvements of
Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area,
Kailua, Hawaii

Comments on the adequacy of the subject EIS is acknowledged.

Very truly yours,



for WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

GEORGE R. ARIYOSHI
GOVERNOR



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

E. ALVEY WRIGHT
DIRECTOR

DEPUTY DIRECTORS
WALLACE AOKI
RYOKICHI HIGASHIONNA
DOUGLAS S. SAKAMOTO
CHARLES O. SWANSON

al

IN REPLY REFER TO:

DEC 29 1977

STP 8.4630

Dr. Richard Marland
Office of Environmental
Quality Control
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

Subject: EIS Review for proposed improvements
of Hamakua Drive and related streets
serving the Keolu-Enchanted Lake area
Kailua, Koolaupoko, Oahu

Thank you very much for giving us the opportunity to review and comment on the above-captioned document. We have no comments to offer which could improve the EIS.

We call to the proposing agency's attention, however, that if any work is required within the State's right-of-way, the construction plans would require review and approval by our Land Transportation Facilities Division.

Sincerely,

E. Alvey Wright
E. ALVEY WRIGHT
Director

cc: LT-P

EMW

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-28

January 25, 1978

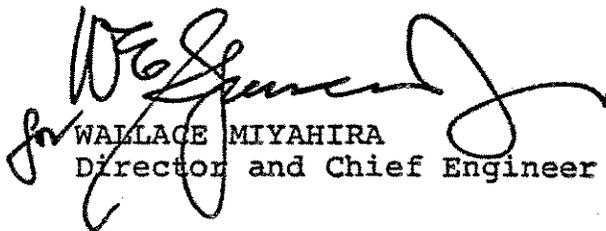
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Gentlemen:

Subject: Your Letter of December 29, 1977
(STP 8.4630) Regarding the EIS for
the Proposed Improvements of Hamakua
Drive and Related Streets Serving the
Keolu-Enchanted Lake Area, Kailua, Hawaii

No work is planned within the State's right-of-way; however, if this should occur, construction plans will be submitted to your office for review and approval.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering



78 00447

University of Hawaii at Manoa

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JAN 26 9 23 AM '78

TO _____

ENV dl
Engrg (eg)

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

Office of the Director

January 20, 1978

RE:0241

Office of Environmental Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Dear Sir:

Review for EIS for
Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area
Kailua, Oahu

The staff of the Environmental Center and Charles Lamoureux, Botany Department, have briefly reviewed the above cited EIS. From our brief examination of the document, it appears that the EIS adequately addresses the environmental impacts associated with the project.

We appreciate the opportunity to have reviewed this EIS.

Sincerely,

Doak C. Cox
Director

DCC/sa

cc: Charles Lamoureux
Darro Thuet
Jacquelin Miller
Department of Public Works ✓

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-40

January 31, 1978

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

Dear Dr. Cox:

Subject: Your Letter of January 20, 1978
Regarding the EIS for the Proposed
Improvements of Hamakua Drive and
Related Streets Serving the Keolu
Enchanted Lake Area, Kailua, Hawaii

We acknowledge your comments as to the adequacy of the
environmental impact statement.

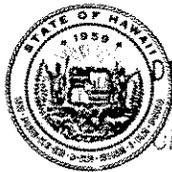
Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

7800200

GEORGE R. ARIYOSHI
GOVERNOR



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RICHARD E. MARLAND, PH.D.
DIRECTOR

JAN 12 8 18 AM '78

TELEPHONE NO.
548-6915

EWV
Engg (w/112)

TO
STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

January 10, 1978

Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

SUBJECT: Environmental Impact Statement for the Proposed Improvements
of Hamakua Drive and Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Oahu

Dear Mr. Miyahira:

We have reviewed the subject environmental impact statement. As of this date, we have received a total of fourteen (14) comments on the subject EIS as shown on the attached list. We have not attempted to summarize the comments of other reviewers. Instead, we recommend that each comment be given careful consideration by yourself. We offer the following comments for your consideration:

- 1) The inclusion of the proposed improvement of Ulumanu Drive in Figure I-1 (p.I-4) is misleading in the sense that this portion of the overall project is not to be implemented. "Previously proposed" might be a better phrase.
- 2) A correction should be made to the dates given for the General Plan of 1964 found on pages II-16 and IV-1.
- 3) On page II-37 "Drain" should be Dredging; also on pg. III-26 "Kanaka" should be Kanaha Pond.
- 4) How much fill will be required for the Hamakua Drive connection? We note the EIS (p II-43) states, "large amounts of fill." Where will this fill come from? Will there be a necessary waiting time before a pavement can be laid over the fill? How will the flood storage capacity of the marsh be affected by the filling of the road right-of-way area?

5) Under the section of Social and Economic Impacts the EIS states (pV-9), "Overall aesthetics will be improved." Yet, on page V-24 the EIS cites the destruction of relatively slow-growing trees and hedges in the urban areas. We suggest that clarification be provided on this topic. Which streets and properties will be affected by the tree and hedge removals?

6) For comparative purposed the State water quality standards might be listed along with the water quality data on page V-22.

7) The connection of Hamakua Drive would destroy three acres of important wetland habit at through filling and bridge construction. Has the alternative of a causeway been considered even though it may be more expensive? The increased physical isolation of portions of the marsh may hamper its role as habitat for the four endangered native bird species. The loss of this habitat should also be discussed in the section on commitments of resources (section IX).

8) Statements in the EIS vary on whether the marsh will be urbanized as a result of the extention of Hamakua Drive. We note that on page II-17 the EIS states, "...it is intended that this portion of Hamakua Drive become a limited access roadway. No private driveways will be permitted access to this road corridor." Even if direct access is not permitted, the improvement to the area's traffic system through this proposed project may encourage urbanization of the marsh. We also note that water and sewer lines will be found along the Hamakua Drive extention. Will hookups to these lines be permitted, or will they be discouraged like that of driveways?

Elsewhere in the EIS, such as on pages II-43, IV-10 and V-14, urbanization of the surrounding marsh is being assumed unless downzoning occurs. The urbanization of the marsh appears to be a significant secondary impact of this project. As such, a thorough discussion of the probable impacts, including demands upon the resource base, changes in land use, water quality, and public services of the affected area should be included. This discussion should also emphasize the further potential loss of endangered species habitat and the likelihood of future flood control measures due to the reduction of the storage capacity of the flood plain.

The EIS Regulations allow the accepting authority or his authorized representative to consider responses received after the fourteen day response period. This Office will exercise the option and will consider responses made by you after the fourteen day period.

Thank you for allowing us to review this Environmental Impact Statement. We trust that our comments will prove useful in the preparation of the Revised Statement.

Sincerely,



Richard E. Marland
Director

List of Commentors on the EIS for the Proposed Improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area, Kailua, Oahu (DPW).

State Agencies

Comment Date

Dept. of Agriculture	12/12/77
Dept. of Defense	12/8/77
Dept. of Planning and Economic Development	12/23/77
Dept. of Transportation	12/29/77

Federal Agencies

Dept. of the Air Force	1/5/78
Dept. of the Army	12/9/77
U.S. Coast Guard	12/9/77
Corps of Engineers	1/4/78
U.S. Fish and Wildlife Service	1/4/78
U.S. Navy	12/14/77

City and County Agencies

Board of Water Supply	12/21/77
Dept. of Housing and Community Development	12/13/77

Others

American Lung Association of Hawaii	12/13/77
Kailua Community Council	12/26/77

CIV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-44

February 1, 1978

Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Your Letter of January 10, 1978, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lakes Area, Kailua, Hawaii

We respond to comments in the subject letter in the same order as they appeared.

1. "Proposed Improvement" was used in Figure I-1 (Page I-4) because Ulumanu Drive is still a general plan primary road. Unless it is deleted from the Detailed Land Use Map, the term used is appropriate.
2. Several typographic errors were discovered after the EIS was printed, including those pointed out by your office. These will be corrected in the Revised EIS.
3. "Drain" is correct. Kanaka will be changed to "Kanaha."
4. The exact amount of fill for the Hamakua Drive connection is not known inasmuch as the construction plans have not been prepared. The same is true for your question regarding the need for surcharging the fill. The flood storage capacity of the marsh will be slightly reduced by the additional fill material for the roadway. There are no designated storage capacity required of the marsh.
5. The term "aesthetics will be improved" refers to Kailua and Wanaao Roads which is mentioned in the previous sentence (page V-9). The appearance of the two roads will be improved by the street's improvements as well as the accompanied interest in home remodeling and other improvements (page V-11). This is apparent, for example, in the improved appearance of the recently improved Oneawa Street in the same neighborhood.

Hedges and tree(s) referred to those located on Kailua and Wanaao Roads, as inferred in the same paragraph (Page V-24). If the 56-foot R.O.W. is utilized for Kailua and Wanaao Roads as recommended instead of the 80 and 60-foot R.O.W.s, much of the trees will be spared. Unfortunately, many of the hedges along Wanaao Road may have to be removed if the improvements are implemented. Additional information regarding trees and hedges are mentioned in Pages II-42 and II-43 of the EIS.

6. The State water quality standards were not reproduced because it might give the impression to the casual reader that the Kawainui Stream was polluted. The present standards in PHRS, Chapter 37-A, do not account for natural conditions which exist for Oahu's streams. The only significant parameter in the standards is the dissolved oxygen concentrations for Class 2 waters which is given on Page V-18.
7. Construction of a causeway was not considered because it would raise the cost of construction substantially. Aesthetically, the causeway would look terrible. In order to minimize permanent detrimental effect of the Hamakua Drive connection, we will be coordinating the planning and design of the project with the State Fish and Game Division of the State Department of Land and Natural Resources (DLNR) (Page V-26). DLNR, by letter dated June 15, 1977, voiced their support of the Hamakua project.

The loss of the habitat for the four native endangered waterbirds is mentioned throughout the EIS, including: Section III. D, Fish and Wildlife (Pages III-21 to III-27); Section IV, Land Use Relationship (Pages IV-10 to IV-11); Section V. G, Wetlands (Pages V-13 to V-14); and Section V. I, Natural Ecological System (Pages V-25 to V-26). Based on these discussions it would appear redundant to discuss the matter again in Section IX.

8. The Hamakua Drive connection will be designated as a limited access roadway to discourage urbanization of the marsh, a mitigative action. Elsewhere in the EIS (Page IV-10), we concede that the surrounding marsh will be urbanized unless down-zoning action of the area is successful.

Water and sewer hookups to any proposed subdivisions surrounding the Hamakua Drive connection will be dependent upon the street layout and grading plan which are not known at this time. It seems unlikely at this time that sewer connections will be permitted directly from the existing trunk sewers on Hamakua Drive. Water laterals from the proposed 12-inch water main may be permitted depending on the circumstances.

Office of Environmental Quality Control
Page 3
February 1, 1978

There are several Federal, State and County agencies who support down-zoning of the affected marsh. The Department of Land Utilization (DLU) is willing to initiate down-zoning of the affected area if the land use designations are changed to conservation and open space on the State Land Use Map or the County Detailed Land Use Map (Memorandum, DLU, December 14, 1977). Development of the marsh would require a SMA permit from DLU. According to DLU, "Further urban development of the wetland cannot be justified" (DLU 1977).

Nevertheless, if the remnant of the Kaelepulu marsh is urbanized, it would result in additional vehicular trips, water demand, sewer service and solid waste generation. The potential number of dwelling units will be about 150 units. Municipal services are available and adequate to serve these units. The adequacy of water service can only be stated when development plans are finalized. As stated in Page V-11 of the EIS, dredging of Kawainui Stream to its general planned width will be required if the abutting lands are developed or subdivided. Additional traffic demand will be served by the proposed Hamakua Drive connection. Water quality in the stream will probably improve with the elimination of animal waste discharged into the stream.

Correction and/or addition to the EIS will be made as appropriate in the revised edition. Responses to comments from individuals who made substantive comments on the EIS will be appended to the Revised EIS.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: Mayor Frank F. Fasi
Div. of Engineering

7800321

RECEIVED
DEPT. OF PUBLIC WORKS
JAN 19 8 45 AM '78
TO ENVll
Engg (y)

January 16, 1978

Office of Environmental Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement: Hamakua Drive
and Related Streets Serving the Keolu-
Enchanted Lake Area

We have reviewed the above EIS and have no critical comments.
We appreciate the opportunity to participate in this EIS review.

Sincerely,

Reginald H. F. Young
Asst. Director, WRRC

RHFY:jmm

Enclosure

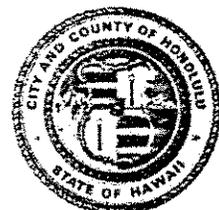
cc: Dept of Public Works

770 9756

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

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DEC 16 1 58 PM '77



FRANK F. FASI
MAYOR

RICHARD K. SHARPLESS
MANAGING DIRECTOR

TO _____
ENV
Engng (cc) (1/19)

TYRONE T. KUSAO
DIRECTOR

I. HARRY ENDO
DEPUTY DIRECTOR

December 13, 1977

Environmental Quality Commission
State of Hawaii
550 Halekauwila Street
Honolulu, Hawaii 96813

Gentlemen:

Subject: Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area
Environmental Impact Statement

We have reviewed the subject environmental impact statement and have no comments to offer.

The copy of the EIS which you forwarded is being retained by us.

Sincerely,

L HARRY ENDO

For TYRONE T. KUSAO
Director

cc: Office of Environmental
Quality Control
Department of Public Works
City and County of Honolulu

7800384

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

DEPT. OF PUBLIC WORKS
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

JAN 23 11 33 AM '78
ENV
Engrg (y)

RAMON DURAN
~~XXXXXXXXXXXX~~
Acting CHIEF PLANNING OFFICER

DGP12/77-3446(CT)

January 23, 1978

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Miyahira:

Environmental Impact Statement for the Proposed
Improvements of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area, Kailua,
Koolaupoko, Oahu, Hawaii, Dated November 14, 1977.
Comments Requested December 5, 1977.

Our concerns regarding the projects discussed in the EIS were transmitted to you in our memorandum of May 31, 1977 to you on the EIS Preparation Notice. We have no additional concerns.

Sincerely,

RAMON DURAN
Acting Chief Planning Officer

RD:ak

cc: OEQC

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-32

January 26, 1978

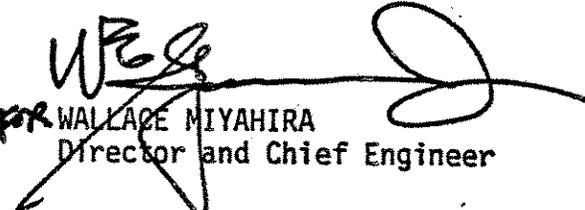
MEMORANDUM

TO : MR. RAMON DURAN, ACTING CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: YOUR LETTER OF JANUARY 23, 1978 (DGP 12/77-3446 CT)
REGARDING THE EIS FOR THE PROPOSED IMPROVEMENTS OF
HAMAKUA DRIVE AND RELATED STREETS SERVING THE
KEOLU-ENCHANTED LAKE AREA, KAILUA, HAWAII

Your comment on the subject EIS is acknowledged.


FOR WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
 HONOLULU, HAWAII 96813



FRANK F. FASI
 MAYOR

RECEIVED
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DEC 15 10 53 AM '77

TO Envoy

GEORGE S. MORIGUCHI
 DIRECTOR

LU12/77-6958 (JW)
 77/EC-4

December 14, 1977

MEMORANDUM

TO : MR. WALLACE MIYAHIRA, DIRECTOR & CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM : GEORGE S. MORIGUCHI, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED
 IMPROVEMENTS OF HAMAKUA DRIVE AND RELATED STREETS
 SERVING THE KEOLU-ENCHANTED LAKE AREA, KAILUA,
 KOOLAUPOKO, OAHU

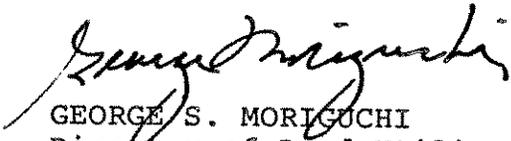
We have completed our review of the EIS and are in accord with the purpose of the actions proposed and find that the potential impacts resulting from this proposal have been adequately stated. The thorough analysis you have given to alternatives to the proposed action, in terms of the area-wide traffic network in Kailua, provides a very good substantiation for your choice.

As acknowledged in the EIS, a major portion of the proposed Hamakua Drive extension and all of the surrounding undeveloped marsh land lies within the Shoreline Management Area (SMA). The provisions of the SMA ordinance strongly discourage the filling of marsh lands for urban development, particularly where the wetland serves as a habitat for rare or endangered wildlife. The ordinance also discourages the channelization or other alteration of waterways. However, an SMA permit may be granted when adverse effects are "clearly outweighed by public health and safety." We believe, based on the information provided in the EIS, that a permit for the Hamakua Drive extension can be granted if measures are taken to minimize impacts on the stream channel and marsh area during and after construction.

On the other hand, further urban development of the wetland cannot be justified. We support any proposal to down-zone these areas to prevent development and protect the marsh as an open area. Down-zoning would be consistent with the purpose and intent of Ordinance No. 4529, as amended, and the proposed flood hazard district ordinance. However, we are constrained from initiating such a down-zoning until either the State Land Use Commission revises the district boundary or the County's Detailed Land Use Map is amended.

MEMO TO: MR. WALLACE MIYAHIRA
Page 2

Should you have any questions, please contact Mr. John Whalen of our staff at 523-4256.


GEORGE S. MORIGUCHI
Director of Land Utilization

GSM:ey

End

ENV 77-564

December 16, 1977

MEMORANDUM

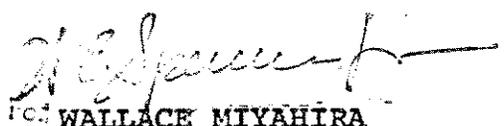
TO : MR. GEORGE S. MORIGUCHI, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF DECEMBER 14, 1977, REGARDING
THE EIS FOR THE PROPOSED IMPROVEMENTS OF HAMAKUA
DRIVE AND RELATED STREETS SERVING THE KEOLU-ENCHANTED
LAKE AREA, KAILUA, HAWAII (LUL2/77-6958 JW 77/EC-4)

Measures will be taken to minimize impacts on the stream channel and marsh area during and after construction. We acknowledge your support to down-zone the marsh to protect it from being developed. We also understand your constraints from initiating such a down-zoning action at this time.

Since the matter of down-zoning the marsh was raised by the Department of General Planning, your comments will be transmitted to that agency for their information and/or necessary action.


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Dept. of General Planning (w/memo)
Div. of Engineering

7800374

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

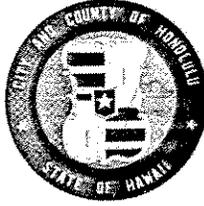
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

DEPT. OF PUBLIC WORKS

JAN 23 10 01 AM '78

TO ENVIL
Enry (cy)

FRANK F. FASI
MAYOR



YOUNG SUK KO
DIRECTOR

January 18, 1978

TO : WALLACE MIYAHIRA, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : YOUNG SUK KO, DIRECTOR

SUBJECT: HAMAKUA DRIVE AND RELATED STREETS SERVING
THE KEOLU-ENCHANTED LAKE AREA

We have reviewed your EIS on subject project and request that the disposition of affected trees be coordinated with our Department.

We recommend that a landscape architect be engaged for the preparation of the street tree plans and necessary beautification improvements.

Young Suk Ko
YOUNG SUK KO, DIRECTOR

EW

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-33

January 26, 1978

MEMORANDUM

TO : MR. YOUNG SUK KO, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER

SUBJECT: YOUR MEMORANDUM OF JANUARY 18, 1978, REGARDING THE EIS
FOR THE PROPOSED IMPROVEMENTS OF HAMAKUA DRIVE AND
RELATED STREETS SERVING THE KEOLU-ENCHANTED LAKE AREA,
KAILUA, HAWAII

Disposition of trees affected by the proposed improvements along Kailua and Wanao Roads will be coordinated with your office.

With respect to street trees and any other beautification improvements, we will incorporate such plans as part of our construction contract as developed by your staff. We do not believe that a landscape architect should be engaged for the preparation of such plans at this time.

Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

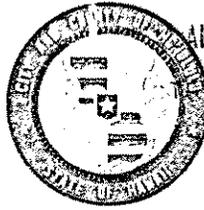
cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813
RECEIVED
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DPW
7800136

FRANK F. FASI
MAYOR



JAN 9 1 50 PM '78
ENV

KAZU HAYASHIDA
DIRECTOR
TELEPHONE 12/77-5130

Engg (4/1/9)

JAN 6 1978

Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Environmental Impact Statement for Proposed
Improvement of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area

We have reviewed the subject Environmental Impact Statement and are satisfied that traffic considerations have been adequately addressed.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Kazu Hayashida".

(for) KAZU HAYASHIDA
Director

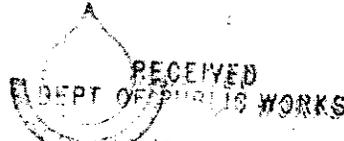
cc: Gov. Ariyoshi
DPW

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA

HONOLULU, HAWAII 96843



DEC 27 2 23 PM '77

TO Environ

December 21, 1977

7769952
FRANK F. FASI, Mayor

YOSHIE H. FUJINAKA, Chairman
STANLEY S. TAKAHASHI, Vice Chairman
FRED DAILEY
TERESITA R. JUBINSKY
WALLACE S. MIYAHIRA
DAT QUON PANG
E. ALVEY WRIGHT

EDWARD Y. HIRATA
Manager and Chief Engineer

Honorable George R. Ariyoshi
Governor, State of Hawaii
c/o Office of Environmental
Quality Control
Room 301
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Governor Ariyoshi:

Your Letter of December 5, 1977 Relating to
the Environmental Impact Statement for
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Oahu

We do not have any additional comments to those already
mentioned in our letter of June 1, 1977, which is appended
to the document.

If you have any further questions on this matter, please
call Lawrence Whang at 548-5221.

Very truly yours,

E. Y. Hirata

FOR EDWARD Y. HIRATA
Manager and Chief Engineer

cc: ✓ Mr. Wallace Miyahira
Director and Chief Engineer
Dept. of Public Works
City and County of Honolulu

7800285

KAILUA NEIGHBORHOOD BOARD NO. DEPT. OF PUBLIC WORKS
P.O. BOX 937
KAILUA HAWAII 96734

RECEIVED
JAN 17 1 22 PM '78

TO _____
10 January 1978

*ENV al
enrg (cy/17)*

Dept of Public Works

Dear Sir:

It is the consensus of the Transportation Committee of the Kailua Neighborhood Board that the EIS under the cover letter dated 5 December 1977 is acceptable and that the Hamakua Drive section be completed as soon as funding and time permit as this is of the highest priority.

Respectfully
A.F. Beaumont
A.F. Beaumont
Chairman, Transportation
Committee KNB-31

ENV 78-25

January 25, 1978

Kailua Neighborhood Board No. 31
P. O. Box 937
Kailua, Hawaii 96734

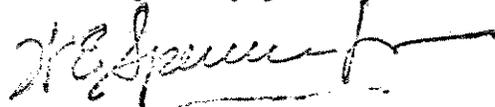
Attention: Mr. A. F. Beaumont, Chairman
Transportation Committee

Gentlemen:

Subject: Your Letter of January 10, 1978, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

Your comments on the adequacy of the EIS and the priority of the Hamakua Drive connection are acknowledged. Hopefully, the Hamakua project will be able to proceed in the immediate future upon the receipt of the necessary funds.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

AMERICAN  LUNG ASSOCIATION *of Hawaii*

December 13, 1977

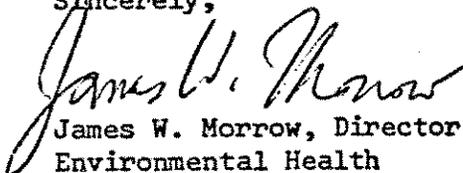
Dr. Richard E. Marland, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

Subject: Hamakua Drive and Related Streets Serving the
Keolu-Enchanted Lake Area

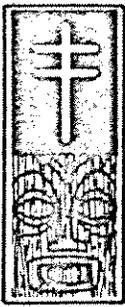
We have reviewed those portions of the subject EIS which pertain to air quality impact. While the methodology employed was acceptable, we did have a number of technical comments regarding the analysis, and these are attached. At this point we are unable to determine whether the potential impacts have been fully disclosed because the EIS does not indicate what traffic volumes were used as input to the air quality impact model. When these have been provided we can then comment conclusively.

Sincerely,


James W. Morrow, Director
Environmental Health

JWM:ct
Att.

cc: Department of Public Works



AMERICAN LUNG ASSOCIATION OF HAWAII

ENVIRONMENTAL IMPACT STATEMENT REVIEW

... an air quality assurance program

Project: Hamakua Drive and Related Streets Serving the
Keolu-Enchanted Lake Area

Date: 12/13/77

1. Page V-34: The inherent traffic assumptions of 88% automobiles and 12% light-duty trucks could and probably should have been adjusted to reflect the local traffic mix including buses and heavy-duty trucks.
2. Page V-35: The correction factor reflecting federal emission control programs could have been adjusted to account for the August, 1977 Clean Air Act Amendments by using the procedures set forth in Supplement 5 to EPA publication AP-42.
3. Pages V-37-38 and V-41-42: A figure showing the exact locations and distances from the roadways of the selected receptors would have been helpful in evaluating this EIS. The present text only indicates which street they are along.
4. Page V-38: Average daily traffic (ADT) was discussed, but the text does not indicate exactly what traffic volumes were input to the screening model employed. Since the model takes 1-hour traffic volumes, what hours were chosen and what were the traffic volumes?
5. Pages V-39-40 and V-43: Since the screening method employed is based on 1-hour averages which can be adjusted to 8-hour averages and the applicable state and federal standards are 1-hour and 8-hour averages, the frequency analysis should also have been based on wind speeds and directions for the hours corresponding to the traffic input to the model. If, for example, the 1100-1200 HST traffic volume was used, then wind data for that hour should also have been used in estimating frequency of occurrence.

STATE OFFICE
245 N. Kukui St.
Hono., Hawaii 96817
Telephone 537-5968

HAWAII COUNTY
Post Office Box 925
Hilo, Hawaii 96720
Telephone 935-1206

KAUAI COUNTY
Post Office Box 991
Lihue, Hawaii 96766
Telephone 245-4142

MAUI COUNTY
Cameron Center
Wailuku, Hawaii 96793
Telephone 244-5110

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-570

December 22, 1977

Mr. James W. Morrow, Director
Environmental Health
American Lung Association of Hawaii
245 N. Kukui Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

Subject: Your Letter of December 13, 1977,
Regarding the EIS for the Proposed
Improvements of Hamakua Drive and
Related Streets Serving the Keolu-
Enchanted Lake Area, Kailua, Hawaii

We are responding to your comments in the attachment of your letter in the same order as they appeared.

1. Local Traffic Mix. There are no supportive data on the local traffic mix for light duty or heavy duty vehicles that utilize or will utilize Hamakua Drive, Keolu Drive, Kailua Road and Wanaao Road. As stated in the EIS there is a lack of truck traffic on Kailua and Wanaao Roads, possibly not more than one percent of the peak hour traffic including buses. Hamakua Drive is not planned to serve as a bus route. The 88% automobiles and 12% light-duty truck traffic mix is believed to be appropriate for the proposed projects.
2. Correction Factors. The correction factors used were 0.8 for 1977 and 0.4 for 1995. No attempt was made to amend these correction factors to account for the 2-year extension on the 1970 Clean Air Standards. The 1995 CO values would be appropriate unless the waiver on the 3.4 ppm CO requirements is granted indefinitely.
3. Exact Location. The exact locations and distances of the receptors were omitted in the EIS to avoid trivial technical data. The data requested are as follow.

- Keolu-Kalaniana'ole: Typical home is located 66 feet from edge of pavement for 80-foot right-of-way (R.O.W.)
- Hamakua Drive: Typical home is located 63 feet from edge of pavement for 70-foot R.O.W.
Typical Business near Kailua Road intersection is located 28 feet from edge of pavement for 80-foot R.O.W.
- Kailua Road: Apartment is located at Aoloa Street intersection 35 feet and 25 feet from edge of pavement for the 40-foot and 56-foot R.O.W.s, respectively.
Church (LDS) near Wanaao Road intersection is located 75 feet and 65 feet from edge of pavement for the 40-foot and 56-foot R.O.W.s, respectively.
Typical home is located 70 feet and 76 feet from edge of pavement for 40-foot and 56-foot R.O.W.s, respectively.
Playground (Kailua) near Hahani Street intersection is located 90 feet and 96 feet from edge of pavement for 40-foot and 56-foot R.O.W.s, respectively.
School (Kailua Intermediate) on Kainalu Drive, nearest classroom building, is located 210 feet and 216 feet from edge of pavement for 40-foot and 56-foot R.O.W.s, respectively.
- Wanaao Road: Typical home is located 40 feet and 38 feet from edge of pavement for 40-foot and 56-foot R.O.W.s, respectively.
- Existing 40-foot R.O.W. - Kailua Road, Wanaao Road
2 - 10-foot lanes, 2 - 10-foot sidewalks
- Proposed 56-foot R.O.W. - Kailua Road, Wanaao Road
2 - 12-foot lanes, 2 - 8-foot parking strips, and 2-8-foot sidewalks
- Proposed 70-foot R.O.W. - Hamakua Drive Connection
4 - 11-foot lanes, 2 5-foot bike lanes, and 2 - 8-foot sidewalks
- Existing 80-foot R.O.W. - Keolu-Kalaniana'ole
4 - 12-foot lanes, 2 - 8-foot parking strips, and 2 - 8-foot sidewalks

Proposed 80-foot R.O.W. - Hamakua Drive - Kailua Road
 4 - 11-foot lanes, 1 - 10-foot left turn
 lane, 2 - 5-foot bike lanes, and
 2 - 8-foot sidewalks

4. Traffic Data. Average daily traffic (ADT) and peak 1-hour data are listed on pages II-31 to II-35 of the EIS. The peak 1-hour traffic occurred in the afternoon hours, 4:30 - 5:30 p.m. for Kailua Road and Keolu Drive, and 4:15 - 5:15 p.m. for Wanaao Road. Peak hour for Hamakua Drive was assumed to occur between 4:30 to 5:30 p.m. The average 8-hour traffic for all the streets analyzed occurred between 12:00 p.m. to 8:00 p.m.

For convenience, the pertinent traffic data will be repeated here.

<u>Without Improvements</u>	<u>1977</u>	<u>1995</u>
Wanaao Road		
ADT	11,134	13,400
Peak 1-hour	990	1,200
Enchanted Lake Bound	594	720
Kailua Road Bound	396	480
Average 8-hour	772	925
Enchanted Lake Bound	408	490
Kailua Road Bound	364	435
Keolu Drive		
ADT	14,782	17,500
Peak 1-hour	1,200	1,420
Enchanted Lake Bound	828	980
Kalaniana'ole Highway Bound	372	440
Average 8-hour	910	1,076
Enchanted Lake Bound	510	603
Kalaniana'ole Highway Bound	400	473
Kailua Road		
ADT	18,429	28,400
Peak 1-hour	1,569	2,400
Enchanted Lake Bound	1,004	1,536
Kailua Town Bound	565	864
Average 8-hour	1,287	1,988
Enchanted Lake Bound	734	1,133
Kailua Town Bound	553	855
<u>With Improvements</u>	<u>1977</u>	<u>1995</u>
Wanaao Road		
ADT	8,900	10,000
Peak 1-hour	792	890

<u>With Improvements</u>	<u>1977</u>	<u>1995</u>
Enchanted Lake Bound	475	534
Kailua Road Bound	317	356
Average 8-hour	614	690
Enchanted Lake Bound	325	366
Kailua Road Bound	289	324
 Keolu Drive		
ADT	12,000	13,900
Peak 1-hour	970	1,150
Enchanted Lake Bound	669	794
Kalaniana'ole Highway Bound	301	356
Average 8-hour	738	855
Enchanted Lake Bound	413	479
Kalaniana'ole Highway Bound	325	376
 Kailua Road		
ADT	13,500	17,600
Peak 1-hour	1,150	1,500
Enchanted Lake Bound	736	960
Kailua Town Bound	414	540
Average 8-hour	945	1,232
Enchanted Lake Bound	539	702
Kailua Town Bound	406	530
 Hamakua Drive		
ADT	8,500	14,800
Peak 1-hour	790	1,400
Enchanted Lake Bound	506	896
Kailua Road Bound	284	504
Average 8-hour	627	1,092
Enchanted Lake Bound	326	568
Kailua Road Bound	301	524
 Kailua Road Intersection Distribution		
Peak 1-hour		
Enchanted Lake Bound	506	896
Kailua Road Bound (left turn)	150	267
Kailua Road Bound (straight & right turn)	134	237
Average 8-hour		
Enchanted Lake Bound	326	568
Kailua Road Bound (left turn)	160	278
Kailua Road Bound (straight & right turn)	141	246

5. Wind Data. The wind data used was not considered fully adequate for the degree of refinement suggested. There are no wind data corresponding to the specific significant hours analyzed.

Mr. James W. Morrow

- 5 -

December 22, 1977

If further clarification is desired, you may call Mr. Chew Lun Lau at 523-4150.

Very truly yours,



FOR WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
DLU
Div. of Engineering

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 77-573

December 28, 1977

Mr. James W. Morrow, Director
Environmental Health
American Lung Association of Hawaii
245 N. Kukui Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

**Subject: Environmental Impact Statement for the
Proposed Improvements of Hamakua Drive and
Related Streets Serving the Keolu-Enchanted
Lake Area, Kailua, Hawaii**

This letter will clarify our response of December 22, 1977, to your letter of December 13, 1977, regarding the correction factors used in the subject EIS for CO concentration in Table V-4 and V-5. The correction factors used were obtained from Table 2 (page 42) from Volume 9, Guidelines for Air Quality Maintenance Planning and Analysis. The correction factors used for 1977 and 1995 were 0.8 and 0.4, respectively, corresponding to the low altitude values for the year 1977 and 1980 as given in Table 2.

The Clean Air Amendment of 1977 does not affect the CO emission standards of 15 gm/mi for 1975, 1976 and 1977 models, therefore, the 0.8 correction factor used is an appropriate estimate. The correction factor of 0.4 for the year 1980 was used for the design period ending 1995 because of several unknown factors. The 1977 amendment, for example, contained a loophole provision for waiving the 3.4 CO requirements up to 7.0 for an undetermined number of years. Any refinement of the correction factor beyond 1978 does not appear warranted at this time.

Supplement No. 5 (December 1975) to AP-42 provides methods for adjusting emission factors (Appendix D); however, it is limited to the year 1990. Appendix D provides an adjustment table (Table D.1-28) for quick appropriate adjustments by vehicle ages for a number of likely future emission standards. The likely future emission standards tabulated by vehicle ages for CO were 15.0 g/mi,

Mr. James W. Morrow

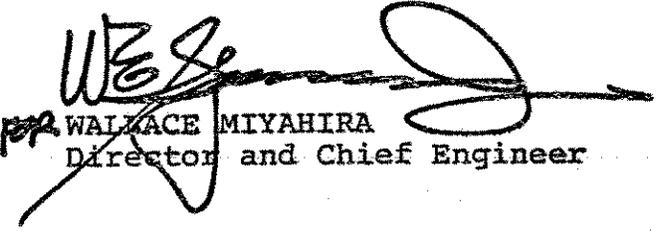
- 2 -

December 28, 1977

9.0 g/mi and 3.4 g/mi. The 7.0 g/mi standard adopted by Congress is not listed nor tabulated by vehicle age. It is not known whether the emission factors for the 7.0 standard can be interpolated by vehicle age in the same manner as the 15.0 and 9.0 g/mi standards.

Based on the aforementioned factors and the loophole in the 1977 Amendment, it was decided to use the 0.4 correction factor for the year 1995 as an approximate adjustment factor.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer

RECEIVED
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JAN 11 11 17 AM '78

AMERICAN  LUNG ASSOCIATION of Hawaii

ENV of Engg (cy/11)

January 10, 1978

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: EIS for the Proposed Improvements of Hamakua Drive
and Related Streets Serving the Keolu-Enchanted Lake
Area, Kailua, Hawaii

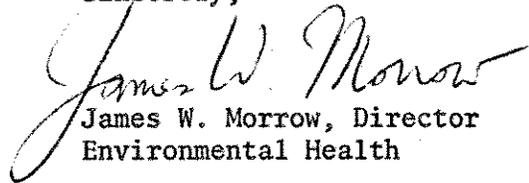
Thank you for your letters of December 22 and 28, 1977 responding to our comments on the subject EIS. Your concern and efforts in providing a thorough response to our comments is greatly appreciated. At this time we wish to acknowledge your responses and, where appropriate, provide additional clarification of our original comments.

1. Local Traffic Mix. The comment was intended to point out that even a relatively small percentage of heavy duty vehicles (HDV) can have a significant effect on the composite emission factor for a given road segment particularly by 1990-1995 when automobile emissions will have been sharply reduced due to federal controls and HDV assume a greater percentage of total emissions.
2. Correction Factors. Your explanation was well put and accepted.
3. Exact Location. The exact locations of potential receptor site are by no means trivial to a reviewer. Most preparers include a figure depicting the exact locations either in the EIS itself or in a supporting technical report.
4. Traffic Data. While it is true that some of the data which you kindly reproduced in your letter were included on pages II-31 to II-35 of the EIS, our point was that the section on Air Quality (pp. V-34 to V-43) did not specifically indicate which traffic volumes were input to the model.
5. Wind Data. The response offered is also the reason why the frequency analysis presented in the EIS is not valid. In order to determine the frequency of occurrence of certain CO concentrations

Mr. Wallace Miyahira
January 10, 1978
Page 2

for certain hours of the day, one must use wind data for those same hours. Use of average frequencies based on all hours over a 9-month period is not valid. For example, the occurrence of 1 knot winds from the northwest may be much more frequent during the 6 - 7 a.m. period every day than during the full 24-hour day when northeast tradewinds of 8 knots may predominate.

Sincerely,

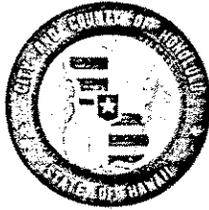

James W. Morrow, Director
Environmental Health

JWM:ct

cc: OEQC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-41

January 31, 1978

Mr. James W. Morrow, Director
Environmental Health
American Lung Association
245 North Kukui Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

Subject: Your Letter of January 10, 1978, Regarding the EIS for the Proposed Improvements of Hamakua Drive and Related Streets Serving the Keolu-Enchanted Lake Area, Kailua, Hawaii

We are responding to your comments in the same order as they appeared in the subject letter.

1. Local Traffic Mix. We agree, however, the local traffic mix is still not known.
2. Correction Factors. No response is necessary.
3. Exact Location. A formal technical report on air quality was not prepared inasmuch as the analysis was prepared in-house. Otherwise, figures would have been submitted; however, our letter of December 22, 1977, did provide detailed information on the location of the various receptors.
4. Traffic Data. No response is necessary.
5. Wind Data. The correct methodology for using the wind data for the peak hour (4:30 to 5:30 pm) could not be employed because the peak hour wind data was not available. There is no claim that it is. Inasmuch as the Pasquill-Gifford atmospheric stability data were not available, there are obvious shortcomings to the wind factor evaluation in the EIS. The information in the EIS was provided, even though we knew beforehand that the methodology could be biased.

Very truly yours,


FOR WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

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KAILUA CHAMBER OF COMMERCE
345 Hahani Street
Kailua, HI. 96734

JAN 9 11 14 AM '78

TO ~~DIR~~
~~DEPT W~~
ENV *ll*

RE: HAMAKUA DRIVE *Engng (4/11)*

Mr. Wallace Miyahimara
Director & Chief Engineer
Department of Public Works
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahimara:

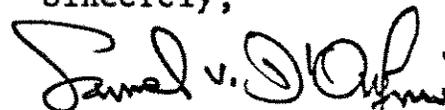
The Kailua Chamber of Commerce has reviewed the Hamakua Drive Extension environmental impact statement and recommends that the road be built at the earliest possible date. Your support in this project is vitally needed.

The impact statement indicates that endangered species may be located in areas that would be in the path of the proposed road along with other exotic species such as mynahs and English sparrows. These birds, it is felt, could easily be relocated to the adjacent Kawainui marsh. The preservation of a portion of the marsh lands, for a wildlife sanctuary, is an excellent recommendation, and we support this proposal.

As previously indicated in our petitions and communications, completion of Hamakua would materially contribute to the orderly flow of traffic from Enchanted Lake to Kailua town. It would benefit the entire community.

Please remember that Hamakua Drive could spell the difference between disaster and success when utilized by the life and property saving efforts of the police and fire departments. I feel certain that both departments have experienced frustrations when forced to fight their way through the heavily trafficked Kailua/Wanaao Road area.

Sincerely,



Samuel V. D'Onofrio
Chairman of Traffic & Transportation

- cc: Governor George Ariyoshi
- Mayor Frank Fasi
- Councilman W. Sandy Holck
- Councilman Daniel Clement
- Senator Mary George
- Senator John J. Hulten
- Representative Jann L. Yuen
- Representative Andrew K. Poepoe
- Representative John J. Medeiros
- Messrs. Ronsman/Urada Kailua Chamber of Commerce
- Messrs. Pico/Kupchak Neighborhood Board
- Messrs. Gibson/Richardson Community Council

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

EW
WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-24

January 25, 1978

Kailua Chamber of Commerce
345 Hahani Street
Kailua, Hawaii 96734

Attention: Mr. Samuel V. D'Onofrio, Chairman
Traffic and Transportation Committee

Gentlemen:

Subject: Your Letter Regarding the EIS for the Proposed
Improvements of Hamakua Drive and Related Streets
Serving the Keolu-Enchanted Lake Area, Kailua, Hawaii

We acknowledge your comments on the needs and priority of the Hamakua Drive connection. Your support for preservation of the adjacent Kaelepu marsh as a wildlife sanctuary is also noted. Downzoning of the marsh, however, cannot be implemented until the State Land Use boundary or the County's Detailed Land Use Map is amended.

Hopefully, the Hamakua connection can be implemented in the immediate future upon receipt of the necessary funds.

Very truly yours,

Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

DEC 27 1977

RECEIVED
DEPT. OF PUBLIC WORKS

DEC 30 8 43 AM '77

TO Enroll

KAILUA COMMUNITY COUNCIL
c/o Kailua Satellite City Hall
302 Kuniie Road
Kailua, HI, 96734

Governor (Off. of Env. Quality Control)
550 Halekauwila Street
Room 301
Honolulu, HI, 96813

Dear Sirs:

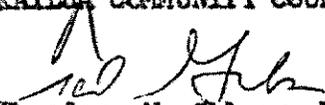
After preparing a letter of comment and suggestion regarding the E.I.S. on Hamakua Drive and Related Streets serving the Keolu-Enchanted Lake Area, I note that the letter should have been sent to your attention, rather than to that of the Director of the Dept. of Public Works.

The letter is therefore attached.

I also note a copy should have been sent to:
Dept. of Public Works
City & County of Honolulu
Honolulu Municipal Building
Honolulu, HI, 96813

I have neither an excess copy, nor have I access to a Xerox machine. Therefore, by copy of this letter I am requesting the staff at "Sandy" Holck's office, City Councilman, to make a copy and forward it to Dept. of Public Works.

Very truly yours,
KAILUA COMMUNITY COUNCIL


Theodore W. Gibson, Pres.

cc: Dept. of Public Works
✓ Councilman "Sandy" Holck's office

DEC 27 1977

December 26, 1977

Mr. Wallace Miyashira, Director
Department of Public Works
650 South King Street
Honolulu, Hawaii, 96813

Subject: EIS For the Proposed Improvement of Hamakua
Drive and Related Streets serving the Keolu-
Enchanted Lake Area.

Dear Mr. Miyahira:

The subject Environmental Impact Statement has been forwarded to the Kailua Community Council for review and comment. May I say it is certainly an outstanding compilation; the history of Enchanted Lake is itself a worthy contribution.

There are two points of suggestions: (1) recommended bridge height and (2) terminus at Kailua Road.

(1) Page III-44 indicates the existing bridge over Ka Awakea Road is 3.00 feet. This is further referenced in the August 12, 1977 letter to Commander Fourteenth Coast Guard District, signed for Mr. Miyahira. Examination of the "bridge" will show it is a dam blocking Kawainui (Kaelepulu) Stream at that point. The dam is important; during summer dry periods Kaelepulu Pond at Enchanted Lake becomes low, much of the bottom land under the upper portion becomes exposed and the level may be 1 - 2 feet below m.s.l. Were there not a dam, a steady flow of saline water would back up through Kawainui Canal and the stream area into Kaelepulu Stream and the Pond, rather upsetting the low-saline contact of the Pond, fed primarily from fresh streams mauka.

The point I am offering for consideration, however, is that the height of the bridge need not afford minimum clearance of 6 feet. The only canoe activity, as it were, above Ka Awakea dam will be the narrow stretch to Kailua Road where stream obstructions will restrict any further travel. I question added expense for extra clearance when almost no surface activity exists.

(2) Page II-18 (Figure II-1) illustrates Hamakua Drive at Kailua Rd, as does Figure II-3, page II-30, along with discussion in section 6, page II-29, "Proposed Widening of Hamakua Drive". It is

Ltr: Kailua Community Council to
Dept. of Public Works, Dec. 26, 1977
Subj: Hamakua Drive E.I.S.

stated (last paragraph, P II-29) "A left turn lane on Hamakua is considered essential (into Kailua Road)... "

I would like to elaborate on the importance of that intersection being a major installation rather than merely widening to include a left-turn lane.

Two Figures are attached to this letter:

Figure I the intersection as it exists

Figure II the recommended reconstruction of the intersection and associated streets.

Figure 1. Kailua Rd., coming in from the right, is 2 lanes over the bridge, then opens to 4 lanes permitting right and left turns, as it exists now. Your attention is invited to numerals 1 and 2 in the intersection, also note 3.

1. Traffic from Kainehe Street crossing to Hamakua must interleave with Hamakua traffic making left turn to Honolulu-bound lane of Kailua Rd.
2. Hamakua left turn into Kailua Rd. is abrupt since cars must stay on the inside lane in order to flow with cars from Kainehe Street Making the right turn to Honolulu-bound lanes.
3. Kailua-bound on Kailua road, left turn into Kainehe Street, the "stall" permits accomodating only 2 cars, a minimum requirement.

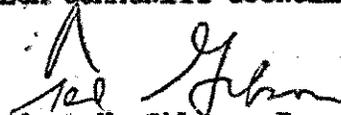
Now consider the increased traffic on Hamakua after the proposed connection. Hamakua is to be widened (Kailua Road to Hekili Street, P II-29, first paragraph) from 56-foot R.O.W. to 80-foot R.O.W. to include a fifth lane (left turn). Two problems will arise: (1) the steady stream of Hamakua left-turn particularly during rush hours will conflict with Kainehe traffic going straight across to Hamakua and (2) Hamakua left turn will have an abrupt turn to stay in the inside lane on Kailua Rd.

Figure 2. Several major revisions are suggested for consideration:

1. Hamakua, as a high traffic artery from Enchanted Lake, deserves two left-turn lanes into Kailua Road. This flow can be accomplished by blocking Kainehe Street (2) so there is no cross traffic.
2. The Kainehe Hamakua-bound traffic, will flow left into Punui St. (made one way since it is not now wide enough for two-way traffic with parking permitted on both sides).
4. Punui Street traffic can make two right turns onto Kailua Road thence proceed Honolulu-bound, or cross over to the left-turn lane to enter Hamakua.
3. The present bridge should be both widened and rearranged so the Hamakua traffic left-turns will be smooth, not abrupt.

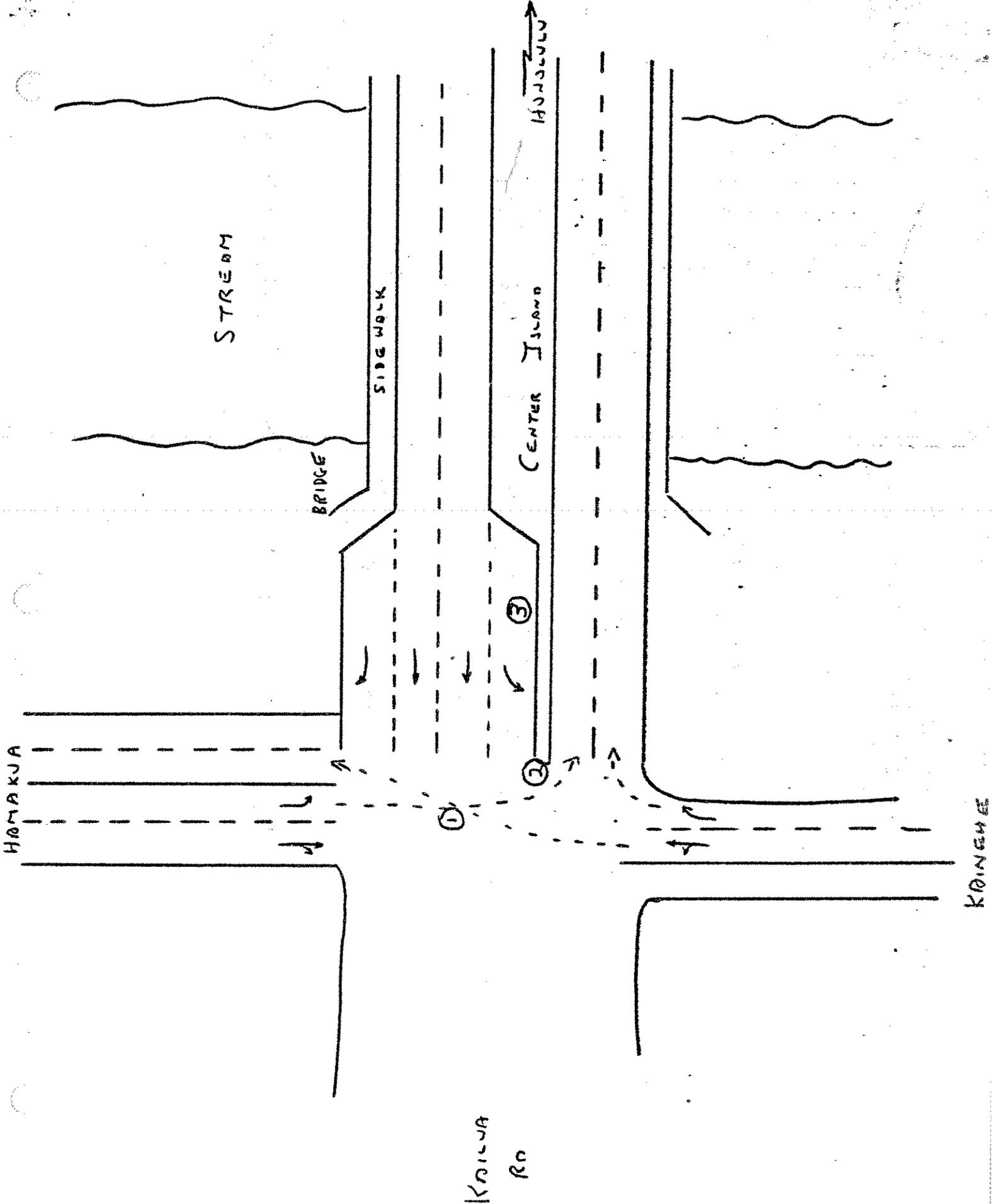
Ltr: Kailua Community Council to
Dept. of Public Works, Dec. 26, 1977
Subj: Hamakua Drive E.I.S.

Very truly yours,
KAILUA COMMUNITY COUNCIL

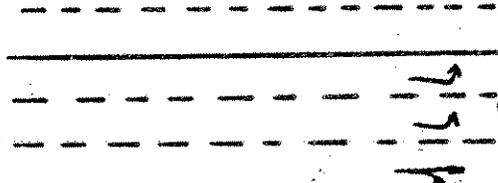

Theodore W. Gibson, President

Encl: Figure 1 (Present traffic pattern at Hamakua & Kailua Rds.)
Figure 2 (Suggested traffic re-arrangement)

✓ cc: Councilman Holck

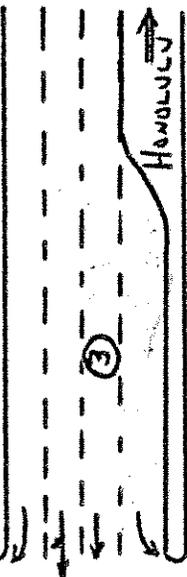


HAMAKUA



①

BRIDGE



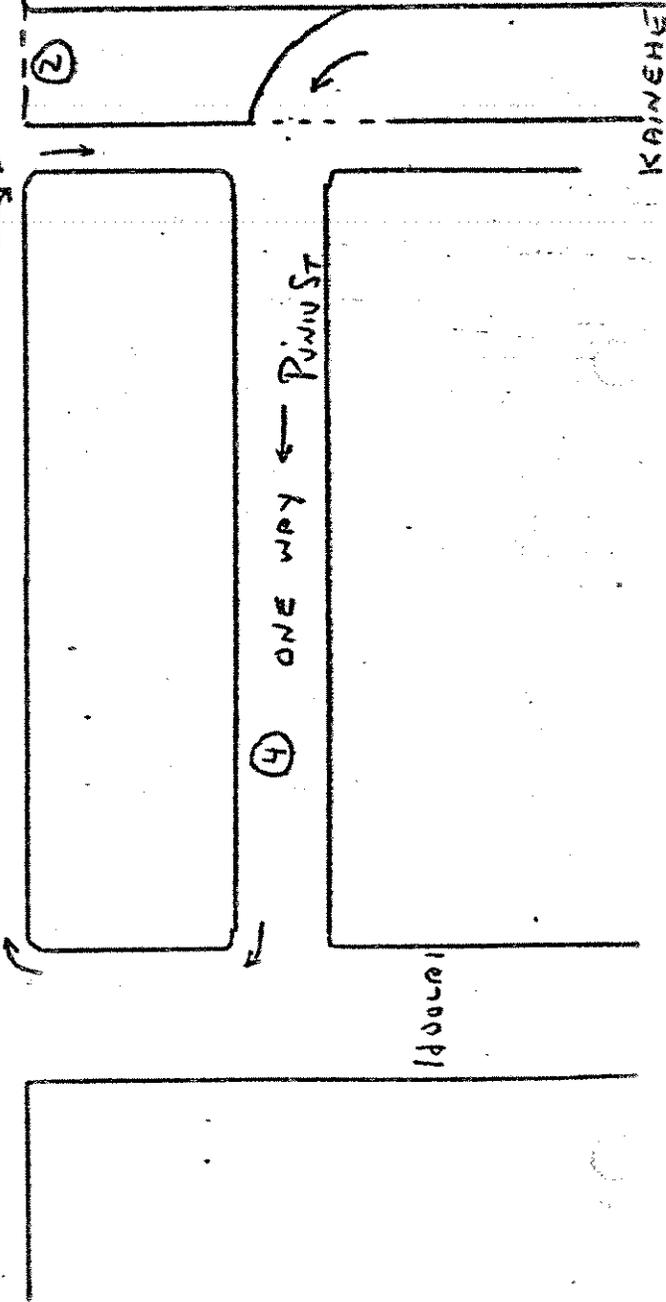
③

KAIHUA RD



②

④ ONE WAY ← PUNAHOU



KAIHEHE

PUNAHOU

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-42

January 31, 1978

Mr. Theodore W. Gibson, President
Kailua Community Council
70 Kailua Satellite City Hall
302 Kuulei Road
Kailua, Hawaii 96734

Dear Mr. Gibson:

Subject: Your Letter of December 26, 1977, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

The Ka Awakea Road bridge across Kawainui Stream, which you refer to as a "dam" is actually a concrete box culvert which has openings that permit interchange of stream water between the upstream and downstream sides. Most of the time, the openings are not visible or barely visible since the water surface elevation is about +2.00 to +3.00 feet mean sea level (msl).

Water surface elevations in the Kaelepulu-Kawainui streams are tidal-influenced despite the fact that the mouth at Kailua Beach Park is blocked by a sand bank. Interchange of saline water and fresh water occurs throughout the tributary reaches. This interchange process is reflected in the water quality data which are shown in Table V-1, page V-22 of the EIS. The mixohaline characteristics of the stream's waters are indicated by the total dissolved solids (TDS) concentrations which ranged from 28,000 milligrams per liter (mg/l) at Kailua Beach to 3,100 mg/l at the Kailua Road bridge. The TDS at the Wanaao Road bridge was 13,988 mg/l compared to the concentration at the Hamakua crossing which was 6,468 mg/l. These data indicate that saline waters are intermixed with fresh water upstream of the Ka Awakea Road bridge. The mixohaline characteristic of the tributary streams has existed probably for hundreds of years and is reflected in the flora in the present wetland adjacent to the proposed Hamakua Drive connection. Soils with salinities as high as 18,000 parts per million were found in the marsh.

There will be no additional cost in providing for a six (6) feet (elevation 7.5 feet) clearance for the proposed Hamakua Drive bridge

Mr. Theodore W. Gibson

- 2 -

January 31, 1978

over Kawainui Stream. The elevation would have been set between 6.0 feet and 7.75 feet anyway. The six feet clearance was requested by the Department of Parks and Recreation and we have no reasons to have it changed.

The traffic routing plan which you suggested for the existing Kailua Road, Hamakua Drive and Kainehe Street intersection is not within the scope of the EIS nor with this department, hence, we will refer your plan to the City Department of Transportation Services for study and response. They will determine whether the proposed plan is workable with respect to traffic safety, capacity, convenience, etc. We like to point up, however, that the widening of Hamakua Drive between Hekili Street and Kailua Road is not scheduled in the near foreseeable future and is not listed in the 6-year Capital Improvement Program of the City and County.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering
DTS

7800214

RECEIVED
DEPARTMENT OF PUBLIC WORKS
POHAKUPU COMMUNITY ASSOCIATION
P. O. BOX 1475
KAILUA, HAWAII 96734

JAN 12 1 38 PM '78

January 5, 1978

TO ENV
Engy cy 1/12

State of Hawaii
Environmental Quality Commission
Office of the Governor
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Subject: Review of Environmental Impact Statement (EIS) pertaining to Hamakua Drive and Related Streets serving the Keolu-Enchanted Lakes Area, Kailua, Oahu

The Executive Board of the Pohakupu Community Association has reviewed the Environmental Impact Statement pertaining to proposed improvements of Hamakua Drive and related streets serving the Keolu-Enchanted Lakes area, Kailua, Koolaupoko, Oahu.

The concensus of the Board is that the proposal is satisfactory and acceptable as outlined in Chapter I of the EIS, with the following reservations:

1. It is stated in numerous places within the EIS that the General Plan improvements to Ulumanu Street will not be implemented and that the General Plan and Developmental Plan will be amended to indicate this. However, the residents of Pohakupu will not rest easily until all references to the proposed extension of Ulumanu Street through Kailua High School into Enchanted Lakes are removed from proposed and existing plans. We will strongly oppose any future attempts to resurrect this "Improvement".

2. While only passing reference is made within this EIS concerning additional vehicle access routes into Kailua High School, we feel more planning and consideration should be given to this possibility so as to ease or eliminate existing traffic problems within Pohakupu created by the single vehicle access road. While improvements such as Keolu Drive to Kalaniani'ole Highway have eased the problems for residents of Enchanted Lakes and traffic flow on Kailua Road, they have increased problems for Pohakupu residents by diverting traffic from Ulumanu Street to Ulupii and other streets within our community. The fact is that there is only one vehicle access road into Kailua High School campus and it is only accessible through Pohakupu subdivision. The Pohakupu Community Association again wants to go on record as strongly supporting any planning that will provide a separate vehicle access into the high school from either Kailua Road or Kalaniani'ole Highway without using the streets of Pohakupu.

January 5, 1978

Thank you for giving us the opportunity to review the current EIS and to voice our views.

As requested, we are returning the EIS with this letter.

Shepard C. Williams

SHEPARD C. WILLIAMS
Chairman, Planning Committee
Pohakupu Community Association

Copy to: Dept of Public Works
City & County of Honolulu
Honolulu Municipal Building
Honolulu HI 96813

ENV

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-31

January 26, 1978

Pohakupu Community Association
P. O. Box 1475
Kailua, Hawaii 96734

Attention: Mr. Shepard C. Williams
Chairman, Planning Committee

Gentlemen:

Subject: Your Letter of January 5, 1978, Regarding
the EIS for the Proposed Improvement of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

The subject EIS is not part of the planning action which will amend the General Plan (GP) and Development Plan (DP) for Kailua, hence, further action will be required before the GP's Ulumanu Street can be deleted. The EIS can be used, however, as a supportive document for the DP amendment under the work program for development plans mandated by the 1977 General Plan for the City and County of Honolulu. We suggest that your views be communicated directly to Mr. Kenneth R. Kupchak, Co-Chairman, Koolaupoko Development Area Organization, P. O. Box 937, Kailua, Hawaii 96734.

The matter of planning and providing a second vehicular access road to Kailua High School is the responsibility of the State. Of course, you are aware that the State has just completed a second access road to the high school by way of Akiohala Street from Enchanted Lake. The second access road terminates in a cul-de-sac at the high school boundary and meets the requirement of the State Department of Education.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

HOUSE OF REPRESENTATIVES

7800213

ANDREW K. POEPOE



RECEIVED 25th District
DEPT. OF PUBLIC WORKS State of Hawaii

JAN 12 1 38 PM '78 DIR
TO ENV DEP WS

Engg (cy. 1/12)

January 10, 1978

Mr. Wallace Miyahira
Director & Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Wally,

I've been following the Hamakua Road development project pretty carefully. As you know, we put State money into this project.

The extension of Hamakua is fine with me and is the top priority item. We want this and at the risk of losing other related projects.

Second priority is the Kailua Road modification from Hahani Street to Wanaao/Awakea. This improvement would help the flow of traffic to the beach.

Third, I am against the widening of Wanaao to Auwina. One good road such as Hamakua, by-passing downtown Kailua, should be adequate for a number of years.

Sincerely,

Andrew K. Poepeo

Eow

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

ENV 78-23

January 25, 1978

Honorable Andrew K. Poepoe
House of Representatives
25th District
State of Hawaii
State Capitol
Honolulu, HI 96813

Dear Representative Poepoe:

Subject: Your Letter of January 10, 1978, Regarding
the EIS for the Proposed Improvements of
Hamakua Drive and Related Streets Serving
the Keolu-Enchanted Lake Area, Kailua, Hawaii

We acknowledge your concurrence with the needs and priorities of the Hamakua Drive connection and the Kailua Road widening. Your concern regarding the widening of Wanaao Road is noted. We recognize that the needs and benefits of improving Wanaao Road are not as substantial as the other two road projects. However, we feel the proposal has merits but can be deferred until both Hamakua and Kailua Roads are completed.

Very truly yours,

Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

cc: OEQC
Mayor Frank F. Fasi
Div. of Engineering

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