Mohouli St. Extension.

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
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County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
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'98 MAY 22 P2:59

OFC. OF QUALITY

May 20, 1998

GARY GILL DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET SUITE 702
HONOLULU HI 96813

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT, MOHOULI STREET EXTENSION

The Hawaii County Department of Public Works has reviewed the comment letters received during the 30-day public comment period which began on September 23, 1997. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI). Please publish this notice in the next edition of the *OEQC Environmental Notice.*

We have enclosed a completed OEQC Environmental Notice Publication Form and four copies of the final EA. Please contact Ben Ishii, Engineer, at 961-8327 if you have any questions.

DONNA FAY K. KIYOSAKI, PE
Chief Engineer

Attachments

cc: Ron Terry
ENG (B. Ishii)

51

1998-06-08-HI-FEA-Mohouli Street Extension

JUN 8 1998

FILE COPY

MOHOULI STREET EXTENSION
KOMOHANA STREET TO KAUMANA DRIVE
SOUTH HILO, HAWAII

ENVIRONMENTAL ASSESSMENT

Project No. STP-2790(1)

Submitted Pursuant to the National Environmental Policy Act (NEPA),
42 U.S.C. 4332 (2)(c), Section 4(f) of the Department of Transportation Act (DOT)
49 U.S.C. 303, and Chapter 343, Hawaii Revised Statutes (HRS)

U.S. Department of Transportation, Federal Highway Administration (FHWA)
State of Hawaii, Department of Transportation, Highways Division
County of Hawaii, Department of Public Works

MOHOULI STREET EXTENSION
KOMOHANA STREET TO KAUMANA DRIVE
SOUTH HILO, HAWAII

FINAL ENVIRONMENTAL ASSESSMENT
Project No. STP-2790(1)

Submitted Pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. 4332 (2)(c), Section 4(f) of the Department of Transportation Act (DOT) 49 U.S.C. 303, and Chapter 343, Hawaii Revised Statutes (HRS)

U.S. Department of Transportation, Federal Highway Administration (FHWA)
State of Hawaii, Department of Transportation, Highways Division
County of Hawaii, Department of Public Works

April 20, 1998
Date of Approval

Donna Fay K. Kiyosaki, Chief Engineer
Hawaii County Department of Public Works

5/11/98
Date of Approval

Kazu Hayashida, Director
Hawaii State Department of Transportation

5/12/98
Date of Approval

Abraham Wong, Division Administrator
Federal Highway Administration

The following persons may be contacted for additional information concerning this document:

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Ms. Donna Fay K. Kiyosaki, Chief Engineer
County of Hawaii
Department of Public Works
25 Aupuni Street, Room 202
Hilo, Hawaii 96720
(808) 961-8321

The proposed project would extend Mohouli Street 2.13 km between Komohana Street (the eastern terminus) and Kaumana Drive (the western terminus) in Hilo, Hawaii County. The extension would provide an efficient, safe link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas of Hilo. The project would also relieve traffic congestion from the intersection of Komohana Street and Waianuenue Avenue. Substantial improvements in safety levels, travel times, circulation efficiency and air quality would result. Adverse impacts include microscale air quality, traffic spillover onto adjacent streets, and construction-phase disturbance. Mitigation measures include separately planned and funded upgrades to intersections on adjacent streets, and conditions imposed as part of the Department of the Army Nationwide Permit for dredge and fill.

FEDERAL HIGHWAY ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT
FOR
MOHOULI STREET EXTENSION, KOMOHANA STREET TO KAUMANA DRIVE

The FHWA has determined that the Build Alternative will have no significant impact on the human environment. This FONSI is based on the attached EA, which has been independently evaluated by FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. The FHWA takes full responsibility for the accuracy, scope, and content of the attached EA.

5/13/98
Date

Abraham Wong
Abraham Wong, Division Administrator
Federal Highway Administration

SUMMARY

PROJECT DESCRIPTION, PURPOSE AND NEED, AND ALTERNATIVES

The proposed project would extend Mohouli Street 2.13 km (1.26 miles) between Komohana Street (the eastern terminus) and Kaumana Drive (the western terminus) in Hilo, Hawaii County (Fig. 1-1). The design specifies two travel lanes 3.6 m (12.0 ft.) in width, with 2.4 m (8.0 ft.) shoulders and 3 m (10 ft). paved swales. The extension would provide a more efficient link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas of Hilo. Motorists would realize a considerable savings in fuel and time. The project would also relieve unnecessary traffic congestion from the intersection of Komohana Street and Waianuenue Avenue and adjacent areas.

COST AND SCHEDULE

Estimated costs are $515,000 for project design, $1.5 million for right-of-way acquisition, and $5.6 million for construction, for a total cost of $7.615 million. Funding would be derived from federal match funds. If necessary approvals are obtained, the project would begin construction in early-1999 and would last approximately 12 months.

LEAD AGENCIES AND ACCEPTING AUTHORITY

The Federal Highway Administration (FHWA) and the Hawaii State Department of Transportation (HDOT) are serving as joint lead agencies to prepare an Environmental Assessment (EA) in compliance with federal and State of Hawaii requirements, with the assistance of the Hawaii County Department of Public Works. The approving authority for the EA is the Division Administrator of FHWA.

AFFECTED ENVIRONMENT

The project area is within the city of Hilo, which encloses about 50 square km (20 square mi.). The area most directly affected is a roughly triangular area defined by Komohana Street, Waianuenue Avenue/Kaumana Drive, and Mohouli Street (Fig. 1-1). Geology consists of lava flows from Holocene eruptions of Mauna Loa with slopes of 1 to 7 degrees. A total of approximately 1,000 m (3,200 ft.) of the project corridor traverses three segments of designated flood zones, including a crossing of the Alenaio Stream system.

The poorly developed, acidic soil supports two vegetation types: low-stature forest dominated by the native 'ohi'a lehua (Metrosideros polymorpha var. incana) and the mat-forming fern, uluhe (Dicranopteris linearis), and an area of introduced grasses and trees on abandoned agricultural lands. No plants listed, or proposed for listing, as threatened or endangered by U.S. Fish and Wildlife Service were found within or near the right-of-way. No endangered or otherwise rare bird or mammal species were observed within the project area. However, it is possible that here, along with most locations on the island of Hawaii, endangered species including the native bat or one of several native birds forage or fly over the site. Wetland indicators are present in two locations on small areas of the corridor. No ponds, permanent streams, or intermittent stream channels with frequent flowing or standing water are located in the project corridor. No aquatic habitat is present.

The Mohouli Extension would traverse the developing neighborhood of Sunrise Ridge. It would connect the older communities of Lower Kaumana/Ainako with the existing Mohouli Street. All of the neighborhoods are essentially residential, and no farms or farmland are present. None has a distinct area of central focus such as a local shopping district, community center or park. The presence of community associations in each neighborhood shows that a sense of community nevertheless exists. Very little difference exists in most demographic categories among the various groups affected in some way by the project. The neighborhood through which the proposed project passes is near the average for Hilo in most measures.

The Mohouli Extension has been part of County planning since the late 1950s, and is included in the Hawaii County General Plan. Right-of-way reservation has been required in subdivisions and public projects since that time. The proposed project is consistent with all planning, and no rezoning, reclassification or use permits are required.

Federal environmental approvals for the project have been obtained. The State Historic Preservation Officer has concurred with the findings of an archaeological inventory survey of a 60 m (200-ft.) wide corridor centered on the right-of-way, which determined that no archaeological features were present. The project was granted a provisional Department of the Army Nationwide Permit for dredge and fill in the waters of the United States on September 9, 1996 (this permit elapsed on January 21, 1997, and is currently undergoing reauthorization). The project has been determined to be consistent with the Hawaii Coastal Zone Management Program by the Hawaii Department of Business, Economic Development, and Tourism, Office of Planning (see Section 4.3 for coordination letters).

ENVIRONMENTAL IMPACTS

The expected environmental impacts of the project and proposed mitigation are presented below and summarized in Table S-1.

Table S-1
Summary of Impacts and Proposed Mitigation Measures
Build Versus No-Build Alternative

Impact Category	No-Build Alternative	Build Alternative
Water Quality	No impact.	Minor impact mitigable through natural rock filtration of runoff prior to entry to groundwater or streams.
Air Quality	Microscale carbon monoxide increase at/above federal standards.	Microscale carbon monoxide increase at/above federal standards.
Noise	Noise increase not exceeding state or federal standards. No mitigation.	Noise increase not exceeding state or federal standards. No mitigation necessary.
Native Flora	No impact.	Loss of some native vegetation in south half of ROW; no sensitive species or ecosystems affected.
Native Fauna	No impact.	Loss of vegetation providing marginal habitat for endangered 'Io and Bat. Higher quality habitat is widespread in region.
Wetlands	No impact.	Disturbance to approx. 970 sq. m. (10,100 sq. ft) of wetlands; Nationwide Permit will specify mitigation.
Planning	Fail to fulfill General Plan goals.	Fulfillment of planning goals.
Relocation	No impact.	No impact
Visual	No impact.	Minor changes mitigable through landscaping, mostly utilizing native plants that match surroundings.
Historic Sites	No impact.	No impact.
Agricultural Land	No impact.	No impact.
Transportation	Continued and worsened congestion, long travel times, inefficient circulation and high accident rate. LOS of C or worse at most intersections for peak hours	Improvement in traffic circulation, shorter travel times, increased safety. LOS of C or better at all but one intersection at peak hours
Energy	Inefficient travel leading to increased energy consumption.	Efficient travel leading to decreased energy consumption.
Construction	No impact.	Noise, vehicle emission, traffic and access impacts, affecting mostly the ten houses/lots with frontage on project. Mitigable through conditions to be imposed in DOH noise permit, and scheduling limitations.
Growth/Cumulative/Secondary	No impact.	Growth inducement none or negligible; no secondary or cumulative effects.

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1 PURPOSE, NEED AND PROJECT DESCRIPTION

1.1 Project Location and Purpose

The proposed project would extend Mohouli Street 2.13 km (1.26 miles) between Komohana Street (the eastern terminus) and Kaumana Drive (the western terminus) in Hilo, Hawaii County (Fig. 1-1). The extension would provide a safe and efficient link between the growing Kaumana area and Komohana Street, which connects to the University and Hilo's major shopping areas.

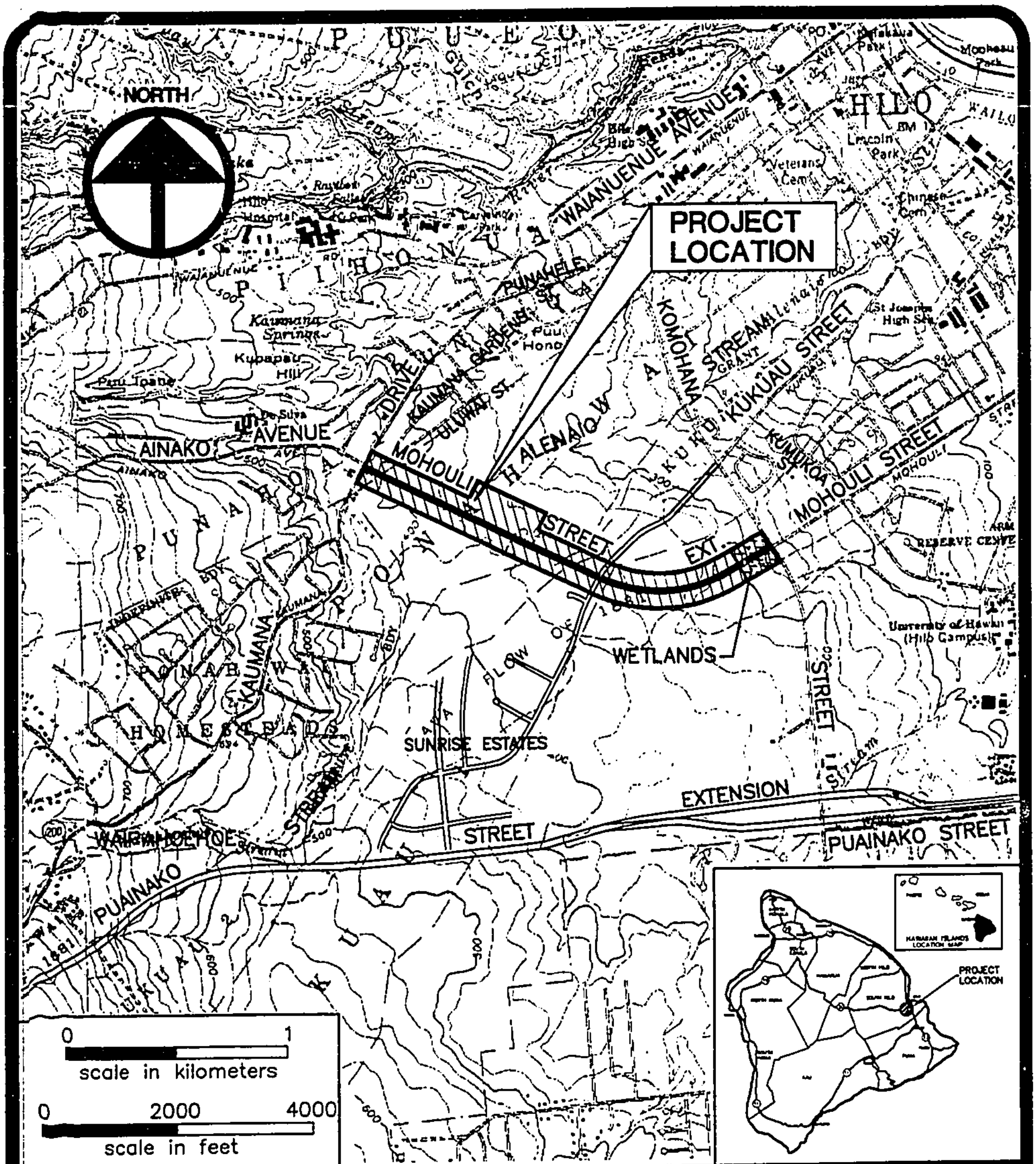
The route shortens the distance from the intersection of Kaumana Drive and Ainako Avenue to the intersection of Mohouli and Komohana Streets by approximately 1,100 m (3,500 feet). The current route, which connects Komohana Street to Kaumana Drive via Waianuenue Avenue, is 54 percent longer than the proposed route. Traffic utilizing the Mohouli Extension would thus realize a considerable savings in fuel and time. Even more importantly, the project would relieve unnecessary traffic congestion from the intersection of Komohana Street and Waianuenue Avenue and adjacent areas.

The Federal Highway Administration (FHWA) and the Hawaii State Department of Transportation (HDOT) are serving as joint lead agencies to prepare an Environmental Assessment (EA) in compliance with federal and State of Hawaii requirements, with the assistance of the Hawaii County Department of Public Works. The approving authority for the EA is the Division Administrator of FHWA.

1.2 Need for Project

1.2.1 System Linkage and Overview

Community plans since the late 1950s have included the Mohouli Extension. It was recognized that the increase in traffic generated by growing Kaumana and Ainako areas, coupled with the increasing shift of commercial activities towards Waiakea and the expansion of the University of Hawaii at Hilo, would eventually generate traffic volumes exceeding the capacity of the existing traffic network.



TITLE **PROJECT LOCATION** COUNTY OF HAWAII, STATE OF HAWAII	FIGURE 1-1
PROJECT MOHOULI STREET EXTENSION HILO, HAWAII	DATE 1/26/98

FIG1-1

The proposed project would directly link Kaumana Drive with Komohana Street at a location well-suited to distribute motorists to their destinations (see Fig 1-1). Komohana Street is a primary arterial running across the slope above Hilo and feeding traffic from the uplands of Hilo to the following areas:

- Downtown Hilo (via Waianuenue Avenue and Ponahawai Street);
- Mid-town Hilo, the Hilo International Airport, and the University of Hawaii at Hilo (via Mohouli and Lanikaula Streets); and
- Waiakea residential and shopping districts (via Puainako and Kawailani Streets).

The linkage achieved by the project would be complemented by the Puainako Extension, for which a federal Environmental Impact Statement (EIS) is currently in preparation (Fig. 1-1).

1.2.2 Current and Future Traffic Conditions

Introduction

Traffic engineers use several methods to measure the amount of traffic on a road and the efficiency with which road segments and intersections handle that traffic.

Average Daily Traffic (ADT) is simply a measure of the number of motor vehicles that pass a given road segment on an average day.

Capacity Analysis is used to rate signalized intersections. The specific methodology for determining the capacity rating is complex, but the basic meaning is suggested by the ratings: under capacity (able to handle all traffic without congestion or delays), near capacity, and over capacity (unable to handle all traffic without congestion or delays).

Level of Service (LOS) is often used to rate unsignalized intersections. LOS is determined by comparing the amount of traffic using a roadway and the amount that the road is designed to carry (its capacity). LOS has values between "A" (Free Flow, when traffic flows without congestion) and "F" (Forced Flow, when traffic must frequently come to a stop). LOS "A", "B", and "C" are considered acceptable. LOS "D" is considered a "desirable minimum" operating level of service. LOS "E" is an undesirable condition, and "F" is unacceptable.

Current traffic data for every road segment and intersection in the project area are not readily available. This document uses the latest system-wide data set from 1992 to represent current conditions. This data set was also used as the basis for future traffic projections, which were generated by a traffic engineer through modeling procedures based on the *Highway Capacity Manual* (Transportation Research Board 1985). The reader is referred to Appendix 1 for the full traffic assessment.

Traffic volumes for the major project area roadways and ratings at key project intersections for the year 2020 were modeled for both the Build and No-Build Alternatives (refer to Section 2 for discussion of Alternatives). The goals were to determine the overall effect of the project on future traffic patterns and to provide data for designing road features such as turning lanes and traffic signals.

Average Daily Traffic

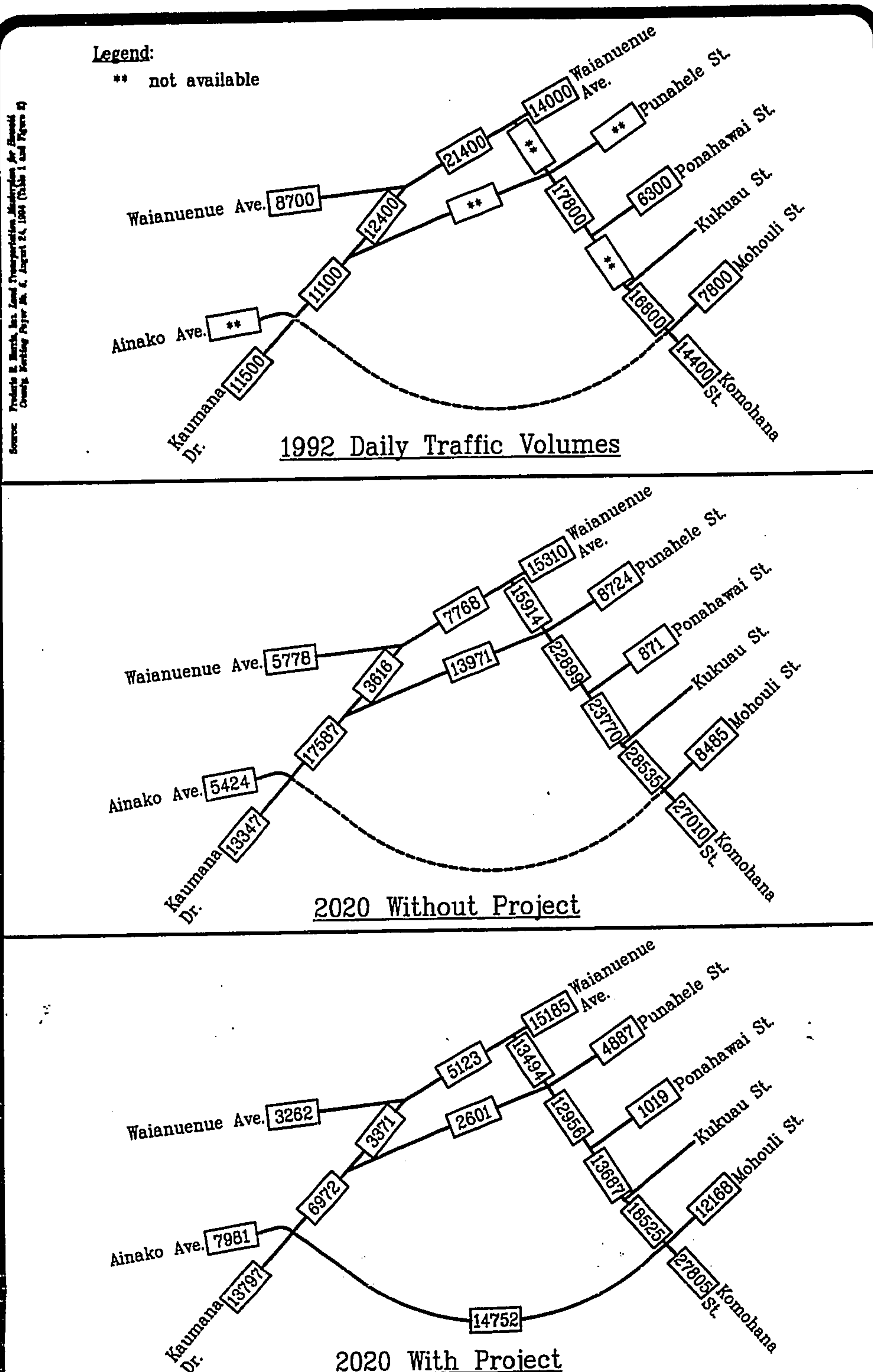
Figure 1-2 is a diagrammatic representation of the project area that includes all key intersections and streets affected by the proposed project. Traffic volumes for 1992 and the year 2020 under both the Build and No-Build Alternatives are listed.

As is evident from Figure 1-2, regional forecasts call for traffic volumes to rise substantially in Hilo during the next two decades, the result of growth in both population and tourism (HDOT, in prep.). Traffic volumes on Kaumana drive above Ainako will increase.[1] If the proposed project is not constructed, a large portion of this traffic will use Punahele Street to access destinations reached via Komohana Street.

The Mohouli Extension would markedly improve the circulation system in the project area. It would divert nearly 15,000 vehicles per day that would otherwise be obliged to use Kaumana Drive to travel between Lower Kaumana and other areas of Hilo. On Punahele Street - where residences immediately front a constricted 10 m right-of-way - traffic would decrease sharply. Between Kaumana Drive and Komohana Street, ADT on Punahele would drop from nearly 14,000 to about 2,600. North of Komohana there would be a reduction of nearly 4,000 vehicles per day on Punahele, to about half of the No Build Alternative levels. Daily traffic volume on Komohana would decrease by as much as 10,000 in several segments, or to about 60 percent of the No Build Alternative levels. A similar relative drop in ADT would occur on Kaumana Drive north (makai) of the intersection with the Mohouli Extension.

The largest increase (aside from the Extension itself) would occur on the existing segment of Mohouli Street, where traffic would increase by 4,000 vehicles per day - about 50 percent. ADT changes of lesser magnitudes would occur at Ainako Avenue and Ponahawai Street, where ADT would rise, and on Waianuenue Avenue, where it would decline. Various changes in land use that have occurred in the area since the base traffic model was developed in 1992 are likely to cause actual traffic volumes to vary from the model. In particular, the growth of a medical facilities cluster between Ponahawai and Punahele Streets will probably increase traffic volumes under both the Build and No Build Alternatives.

[1] Both the Build and No-Build projections for 2020 assume major improvements to the Saddle Road -- which links East and West Hawaii -- and construction of the Puainako Extension (both of which are subjects of EIS's currently in preparation). The first project would increase traffic passing through Upper Kaumana (uphill from Country Club Road), while the second would divert much of this traffic away from Lower Kaumana towards destinations in Waiakea and other parts of southeastern Hilo.



TITLE	TRAFFIC VOLUMES AT SELECTED ROADWAY SEGMENTS	FIGURE 1-2
PROJECT	MOHOULI STREET EXTENSION HILO, HAWAII	DATE 8/23/96

Capacity/Level of Service

The Capacity Ratings and Level of Service presented in Table 1-1 show that in mid-1996, the Mohouli Street/Komohana Street intersection provided marginal Level of Service, while the Ainako Street/Kaumana Drive intersection operates satisfactorily. The installation of a traffic signal at Mohouli and Komohana Street in December 1996 (during the final preparation of this document) has improved traffic flow there. Another traffic signal at Ainako Street/Kaumana Drive was installed in November 1997.

For the year 2020, all intersections affected by the project (with the exception of PM peak hour at Mohouli Komohana Streets) would improve with construction of the Mohouli Extension. Without the project, several intersections would be near or over their capacity to handle traffic flow during the AM or PM peak hours.

Table 1-1
Current and Future Capacity Rating/Level of Service at Key Intersections

Intersection	1996		No-Build Alternative, 2020		Build Alternative, 2020	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Waianuenue at Komohana	[No data]	[No data]	OVER 1.11	NEAR 0.98	UNDER 0.69	UNDER 0.56
Ainako at Kaumana	LOS C OR BETTER	LOS C OR BETTER	UNDER 0.48 LOS A	UNDER 0.63 LOS B	UNDER 0.57 LOS A	UNDER 0.63 LOS B
Mohouli at Komohana	LOS C & F	LOS C & F	UNDER 0.85 LOS D	UNDER 0.54 LOS A	NEAR 0.90 LOS D	UNDER 0.84 LOS D
Mohouli at Kukuau	N/A	N/A	N/A	N/A	LOS A, B, C	LOS A, B, C

Source: Appendix 1. Notes: 1) N/A = not applicable. 2) LOS at signalized intersections summarize multiple movement; at unsignalized intersections, multiple LOS values correspond to various turning movements. 3) Xcm values shown for future signalized intersection based on criteria:

CRITICAL v/c RATIO (Xcm)	RELATIONSHIP TO PROBABLE CAPACITY
$Xcm \leq 0.86$	Under Capacity
$0.86 < Xcm \leq 1.00$	Near Capacity
$Xcm > 1.00$	Over Capacity

1.2.3 Current and Future Safety Conditions

The traffic accident rates adjusted for level of traffic for many roadways and intersections in the project area are higher than average for Hawaii County. Kaumana Drive has one of the highest accident rates of all major road segments in Hilo. Between 1994 and 1996, the non-intersection accident rate on Kaumana Drive between Ainako Avenue and Komohana Street, was 6.28 per 1.6 million vehicle km (1.0 million vehicle miles), compared to a Hawaii County average of 2.26 (Source: calculations based on HDOT published and unpublished data). A report on problem intersections in Hilo for the years 1991-1993 conducted by the Hawaii County Department of Public Works (1994) estimated traffic volumes and calculated the accident rate for each intersection. Included were three in the project area (Table 1-2).

The study determined that several of the intersections met the warrants for signalization, including the intersections of Komohana Street with both Mohouli and Ponahawai Streets.

Table 1-2
Traffic Accidents at Problem Intersections in Project Area, 1991-93

Intersection	Accidents	Injury Accidents	Accidents/ 24-hour approach	Accident Type
Komohana St. @ Punahele St.	19	7	0.0004930	Rear End:6 Left Turn: 4 Right Angle: 7 Out of Control: 2
Komohana St. @ Mohouli St.	9	2	0.0002830	Rear End: 3 Left Turn: 1 Right Angle: 1 Out of Control: 2 Parking/Unpark.: 1 Side Swipe: 1
Komohana St. @ Ponahawai St.	2	0	0.0000883	Rear End: 1 Fixed Object: 1

Source: *Engineering Report for Urban Intersection Study, Island of Hawaii, Project No. FIS 94-07 (02-H-01).* 1994. Prep. by R.M. Towill Corp. for Hawaii County Department of Public Works.

Notes: Accident rate calculated by dividing total number of accidents for three-year period by total intersection 24-hour approach count. The Kaumana Drive/Ainako Avenue intersection was not studied. However, police records show and average of 6 accidents per year until November 1997, when a traffic signal was installed. As of March 1, 1998, no accidents had yet been recorded at the signalized intersection.

Unless modifications to existing roads or diversion of existing traffic occurs, traffic safety conditions (as measured in accidents, injuries, and fatalities) can be expected to worsen in the future. The installation of traffic signals at the intersections of Komohana Street with both Mohouli (complete) and Ponahawai Streets (in planning) have aided and will aid traffic safety. However, in the absence of the proposed project, traffic volumes at and near the intersections of Komohana Street with Punahele Street and Waianuenue Avenue will continue to create hazardous conditions. Although the degree of expected traffic safety deterioration cannot be predicted with any certainty, the rate of deterioration may exceed the simple rate of increase in traffic volumes, because Level of Service will also decrease.

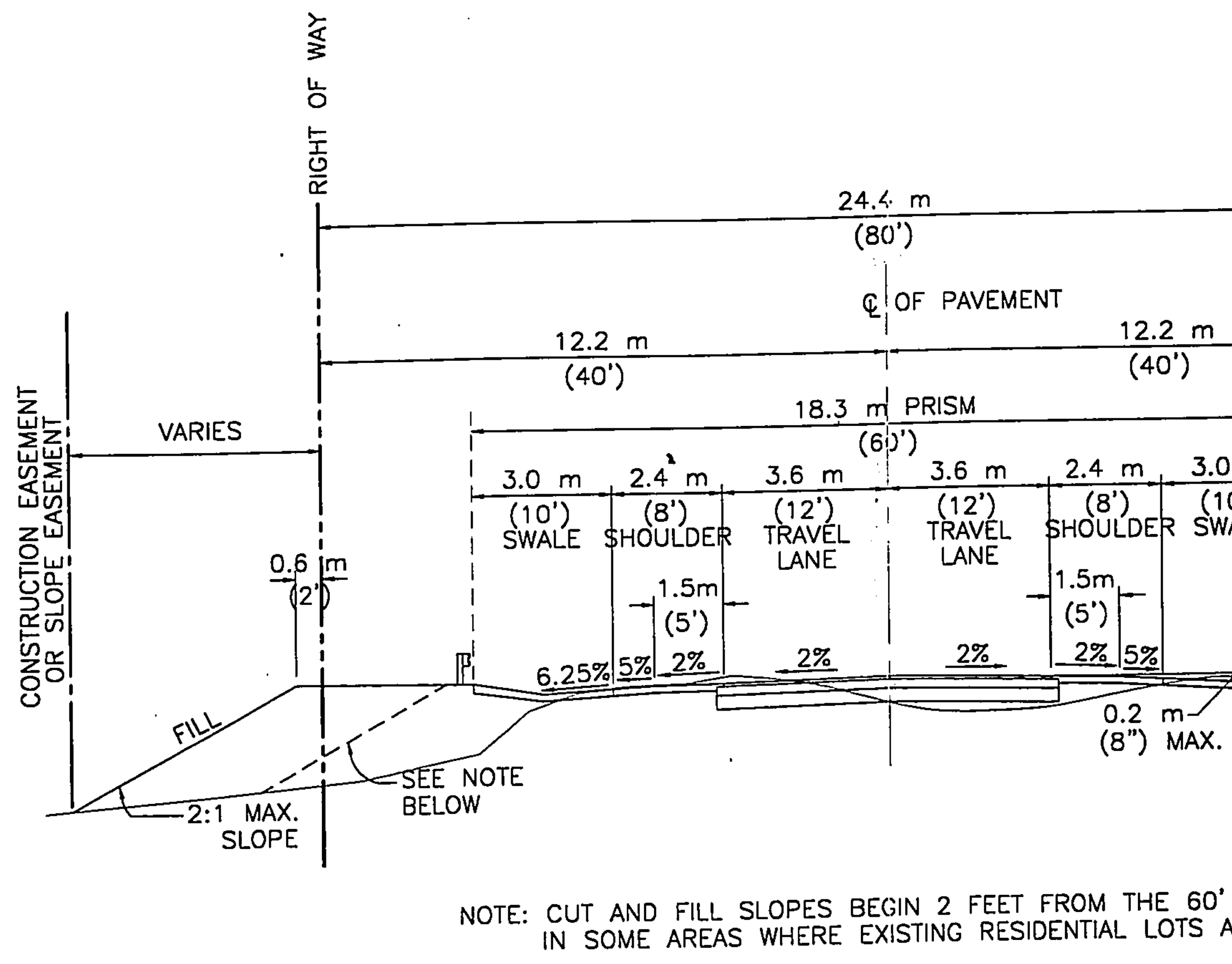
1.3 Project Description, Cost and Schedule

Mohouli Street would be extended as a two-lane road between its current terminus at Komohana Street to the juncture of Ainako Avenue and Kaumana Drive (Fig. 1-1). The existing T-intersection of Mohouli Street and Komohana Street would become a cross-intersection. The segment of Ainako Avenue between Kaumana Drive and Uluwai Street would be widened as part of the project. Between the project termini, the Mohouli Street Extension would also intersect Kukuau Street, a collector street serving Sunrise Estates.

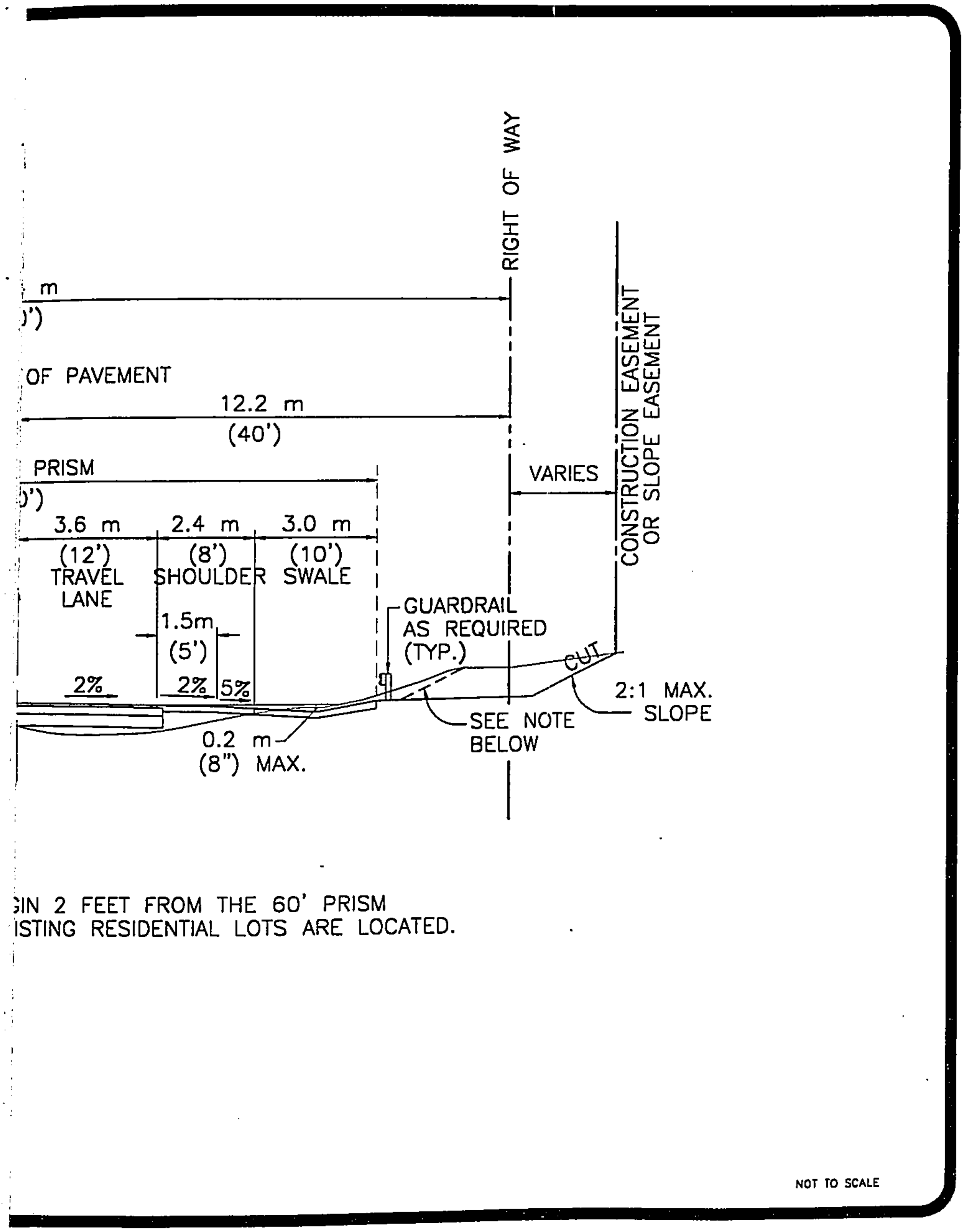
The roadway extension is approximately 1,980 m (6,500 ft.) long. The design specifies two travel lanes 3.6 m (12.0 ft.) in width, a paved shoulder 2.4 m (8.0 ft.) in width, and paved swales 3.0 m (10.0 ft.) in width (Fig. 1-3). Mohouli Street would have left-turn lanes at the intersections with Kaumana Drive, Kukuau Street, and Komohana Drive. Design speed for the project is 80 km/hour (50 MPH), with a posted speed of 72 km/hour (45 MPH). Speed limits will be lowered to 56 km/hr (35 MPH) approaching intersections. Street lighting and drainage structures conforming to federal and County standards will be installed. Drainage structures will require acquisition of additional right-of-way at several locations along the corridor (Figs. 1-1 & 1-4). At one location near Alenaio Stream, an area of approximately 2 ha (5 acres) will be graded to achieve the requisite elevation, and then allowed to revegetate.

The project will also include alteration to intersections (Fig. 1-4). Separate projects installed a traffic signal at the intersection of Mohouli and Komohana Streets in 1996 and another signal at Ainako Avenue and Kaumana Drive in November of 1997. The Mohouli Street Extension will improve the geometrics of the existing intersections by adding concrete curbs, gutters and sidewalks; adding left-turn lanes on all approaches and modifying the signals appropriately; and changing the current drainage inlet/outlet system. The Kaumana Drive right-of-way width will be widened 0.6 m (2.0 ft) to accommodate sidewalks on both sides. This will necessitate acquisition from the two corner lots on the east side of the intersection. Komohana Street/Mohouli Street will become a "cross" intersection with full channelizing and signalizing and left-turn lanes at all approaches. Rounding of corners for 9 m (30 ft.) radii curb returns will require acquisition of additional right-of-way at each intersection.

Estimated costs are $515,000 for project design, $1.5 million for right-of-way acquisition, and $5.6 million for construction, for a total cost of $7.615 million, with a funding source of federal match funds. If necessary approvals are obtained, the project would begin construction in mid-1999 and would last approximately 1 year. The project is included in the 1998-2000 federally approved Statewide Transportation Improvement Program.



TITLE	TYPICAL ROAD CROSS-SECTION	FIGURE 1-3
PROJECT	MOHOULI STREET EXTENSION HILO, HAWAII	DATE 4/15/98


RIGHT OF WAY
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(40')
PRISM
)')
3.6 m
(12')
TRAVEL
LANE
2.4 m
(8')
SHOULDER
3.0 m
(10')
SWALE
1.5m
(5')
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2%
5%
0.2 m
(8") MAX.
GUARDRAIL
AS REQUIRED
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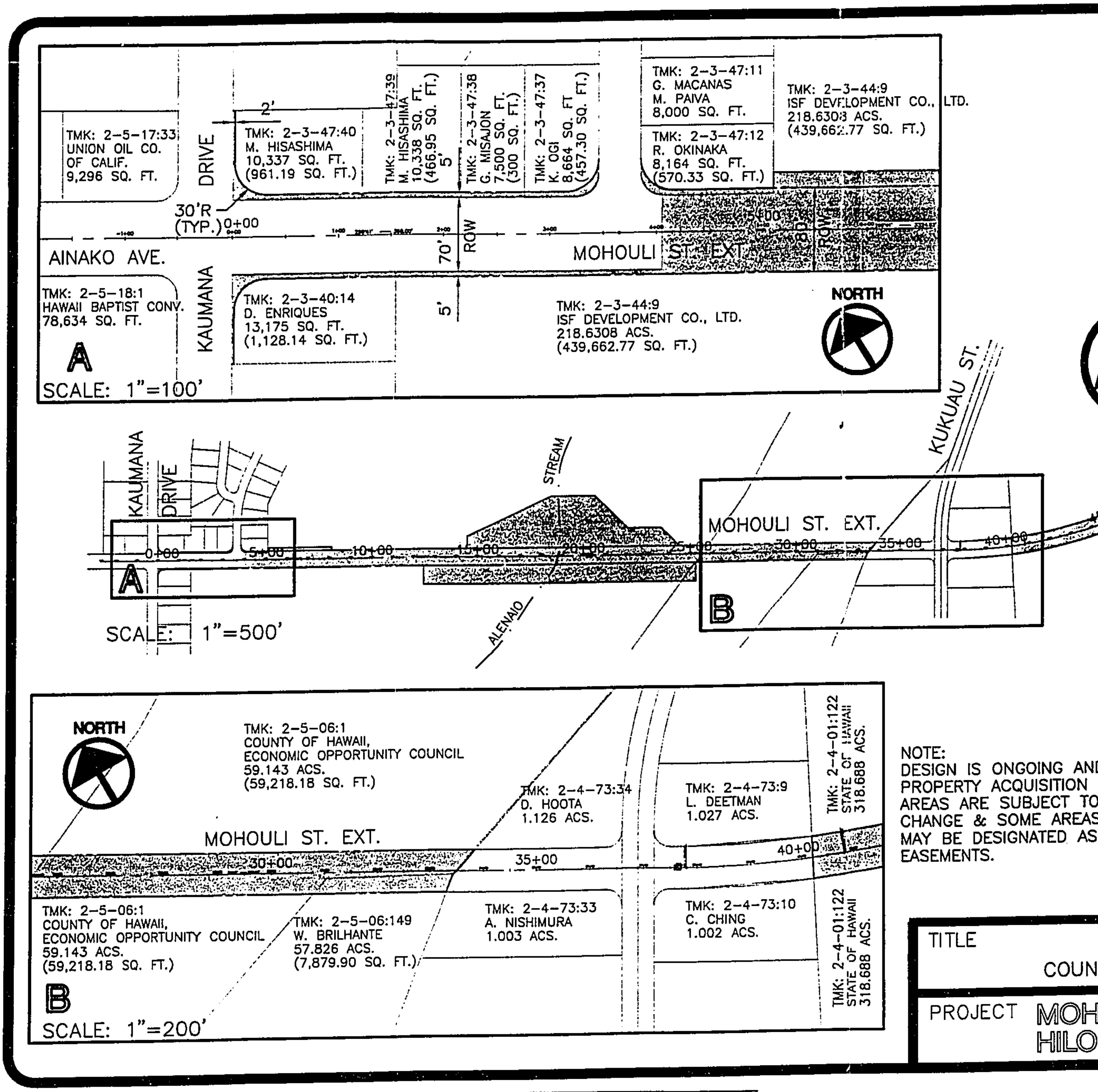
NOT TO SCALE



TMK: 2-5-17:33 UNION OIL CO. OF CALIF. 9,296 SQ. FT.
DRIVE
2'
TMK: 2-3-47:40 M. HISASHIMA 10,337 SQ. FT. (961.19 SQ. FT.)
TMK: 2-3-47:39 M. HISASHIMA 10,338 SQ. FT. (466.95 SQ. FT.)
TMK: 2-3-47:38 G. MISAJON 7,500 SQ. FT. (300 SQ. FT.)
TMK: 2-3-47:37 K. OGI 8,664 SQ. FT (457.30 SQ. FT.)
TMK: 2-3-47:11 G. MACANAS M. PAIVA 8,000 SQ. FT.
TMK: 2-3-47:12 R. OKINAKA 8,164 SQ. FT. (570.33 SQ. FT.)
TMK: 2-3-44:9 ISF DEVELOPMENT CO., LTD. 218.6308 ACS. (439,662.77 SQ. FT.)
30'R (TYP.)
0+00
AINAKO AVE.
70'
ROW
5'
MOHOULI ST. EXT.
80' ROW
TMK: 2-5-18:1 HAWAII BAPTIST CONV. 78,634 SQ. FT.
KAUMANA
TMK: 2-3-40:14 D. ENRIQUES 13,175 SQ. FT. (1,128.14 SQ. FT.)
TMK: 2-3-44:9 ISF DEVELOPMENT CO., LTD. 218.6308 ACS. (439,662.77 SQ. FT.)
NORTH
A
SCALE: 1"=100'
KUKUAU ST.
KAUMANA
DRIVE
STREAM
MOHOULI ST. EXT.
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25+00
30+00
35+00
40+00
ALENAIO
A
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SCALE: 1"=500'
NORTH
TMK: 2-5-06:1 COUNTY OF HAWAII, ECONOMIC OPPORTUNITY COUNCIL 59.143 ACS. (59,218.18 SQ. FT.)
TMK: 2-4-73:34 D. HOOTA 1.126 ACS.
TMK: 2-4-73:9 L. DEETMAN 1.027 ACS.
TMK: 2-4-01:122 STATE OF HAWAII 318.688 ACS.
MOHOULI ST. EXT.
30+00
35+00
40+00
TMK: 2-5-06:1 COUNTY OF HAWAII, ECONOMIC OPPORTUNITY COUNCIL 59.143 ACS. (59,218.18 SQ. FT.)
TMK: 2-5-06:149 W. BRILHANTE 57.826 ACS. (7,879.90 SQ. FT.)
TMK: 2-4-73:33 A. NISHIMURA 1.003 ACS.
TMK: 2-4-73:10 C. CHING 1.002 ACS.
TMK: 2-4-01:122 STATE OF HAWAII 318.688 ACS.
B
SCALE: 1"=200'
NOTE:
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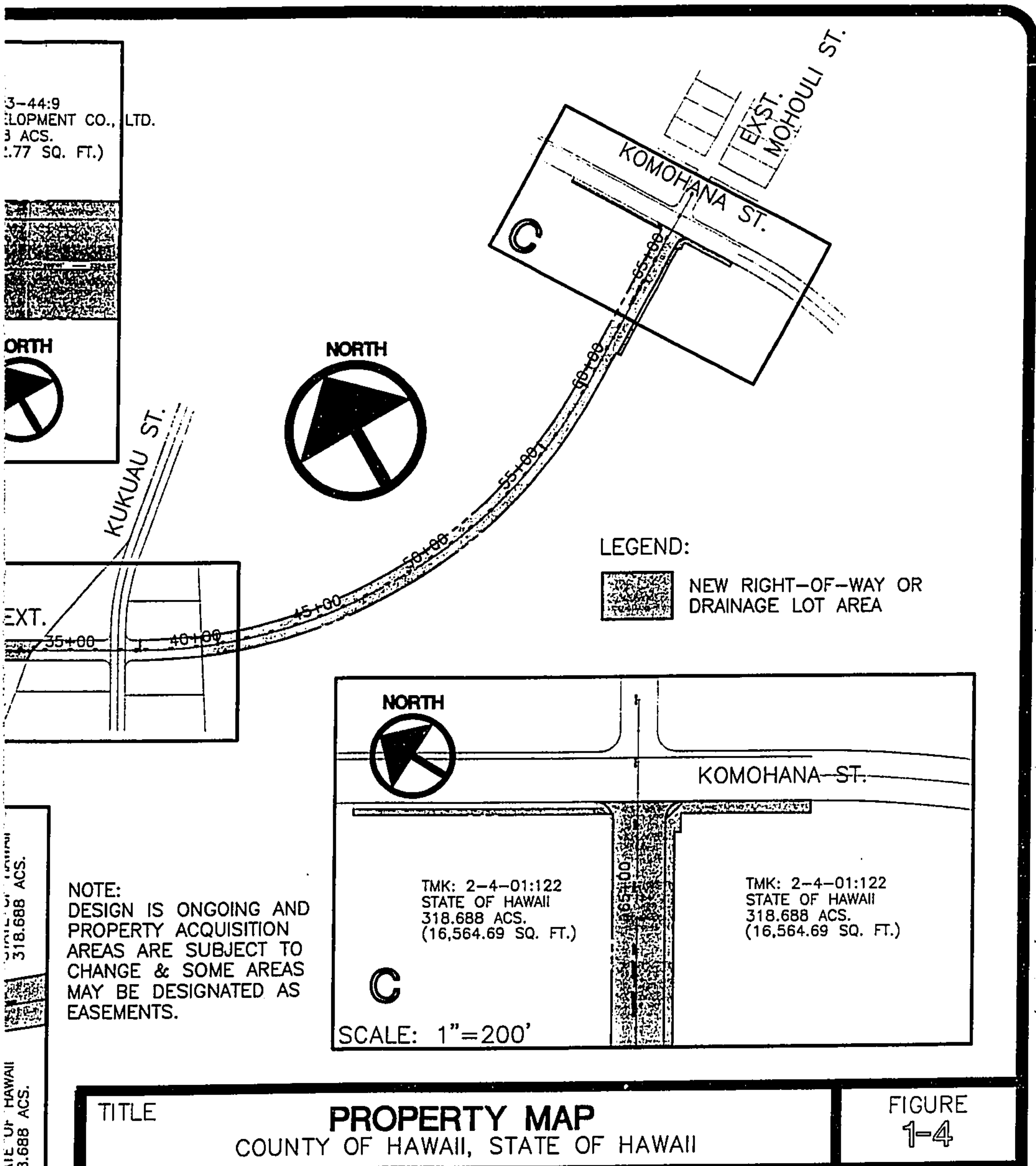


TITLE	**PROPERTY MAP** COUNTY OF HAWAII, STATE OF HAWAII	FIGURE 1-4
PROJECT	MOHOULI STREET EXTENSION HILO, HAWAII	DATE 1/26/98

2 ALTERNATIVES

2.1 Build Alternatives

The Mohouli Street Extension provides the most direct and feasible link between Central and Lower Kaumana (the source of much traffic on Komohana Street) and central Hilo and Waiakea (the destination of much of this traffic). As examination of Figure 1-1 illustrates, no other route could accomplish this goal without disrupting existing residences along Kukuau and/or other streets. It is for this reason that the Mohouli Extension has been a proposed project in the Hawaii County General Plan for three decades. Therefore, no Build Alternatives other than the proposed project (described in Section 1.2) have been considered.

2.2 The No-Build Alternative

The No-Build Alternative is the baseline for comparing both the effects on traffic circulation and the impacts to the social and physical environment of the Mohouli Extension.

The No-Build Alternative does not address current and future deficiencies of capacity and safety on Kaumana Drive, Waianuenue Avenue, and Komohana Street. However, by definition the No-Build Alternative also avoids environmental impacts associated with disturbance of natural and semi-natural vegetation, wetlands alteration and construction-phase impacts to noise and air quality levels.

3 ENVIRONMENTAL SETTING AND IMPACTS

This section describes the existing social, economic, cultural, and environmental conditions surrounding the proposed project along with the probable impacts of the proposed action and mitigation measures designed to reduce or eliminate adverse environmental impacts. For most categories of impact, the No Build Alternative would result in no impacts. Therefore, unless explicitly mentioned, discussion of impacts and mitigation relates to the Build Alternative only.

The island of Hawaii, home to 120,317 residents in 1990 (U.S. Bureau of the Census 1991), is largely rural. Major divisions include West Hawaii and East Hawaii. West Hawaii's dry climate and calm ocean waters support a major tourism industry in the Kona and Kohala districts. East Hawaii has an economy based on agriculture and the business and government functions headquartered in Hilo, the major city on the island.

The project area is within the city of Hilo (Fig. 1-1), which encloses about 50 square km (20 square mi.). The area most directly affected is a roughly triangular area defined by Komohana Street, Waianuenue Avenue/Kaumana Drive, and Mohouli Street, which includes Punahele and Kukuau Streets as well.

3.1 Physical Environment

3.1.1 Geology, Hazards, and Soils

Existing Environment

The island of Hawaii, youngest and largest of the Hawaiian chain, formed from the coalescence of five volcanoes during the last million years. Hilo lies just on the Mauna Loa side of the divide between lavas from Mauna Kea, which has not erupted for 10,000 years, and Mauna Loa, which is still active.

The project area surface is mainly pahoehoe (smooth or ropy) lava flows from Holocene eruptions of the Northeast Rift Zone of Mauna Loa. The surface is underlain by thin layers of basalt lava flows. The lava flows, with their porous rock structure, numerous cracks, lava tubes and interbedded 'a'a (clinker lava) flows, are highly permeable. Slopes range from 1 to 7 degrees, and local relief across this generally uniform slope is minor. No known lava tube or other caves pass under or near the proposed Extension. The soil along most of the alternative alignments overlies recent lava flows and is thus acidic, poorly developed, shallow, and stony. Permeability and runoff are variable and erodibility minor to moderate (U.S. Soil Conservation Service 1973). The engineering properties of the soils present are reasonably adaptable to road construction.

This project (as all development in Hilo) would be subject to volcanic hazard, particularly lava inundation. The United States Geological Survey (USGS) was consulted during preparation of this EA to determine the risks associated with volcanic and seismic hazards (see Section 4.3 for coordination letter). According to the USGS hazard classifications, the entire project area is contained in Lava Flow Hazard Zone 3, on a scale of ascending risk 9 to 1. Zone 3 is considered "less hazardous than [Z]one 2 [which is adjacent to and downslope of active risk zones] because of greater distance from recently active vents and/or because the topography makes it less likely that flows will cover these areas" (Heliker 1990:23).

According to the USGS, the Northeast Rift Zone of Mauna Loa has erupted many times in the last century, sending flows towards Hilo in the years 1880, 1899, 1935, and 1942. A 22-day eruption in 1984 again threatened Hilo, approaching within 10 km (6 mi.) of the Kaumana neighborhood before halting. The 1881 lava flows penetrated the area now occupied by the City of Hilo. Much of the proposed roadway would lie on the 1881 Mauna Loa flow.

In terms of seismic risk, the entire Island of Hawaii is rated Zone 4 Seismic Probability Rating (Uniform Building Code, Appendix Chapter 25, Section 2518). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built. Partly owing to the lack of unconsolidated sediments in the local substrate, none of the several earthquakes of Richter magnitude 6.0 or greater that have occurred in the Hilo area since 1950 has caused substantial damage to well-engineered roads, bridges or other roadway structures.

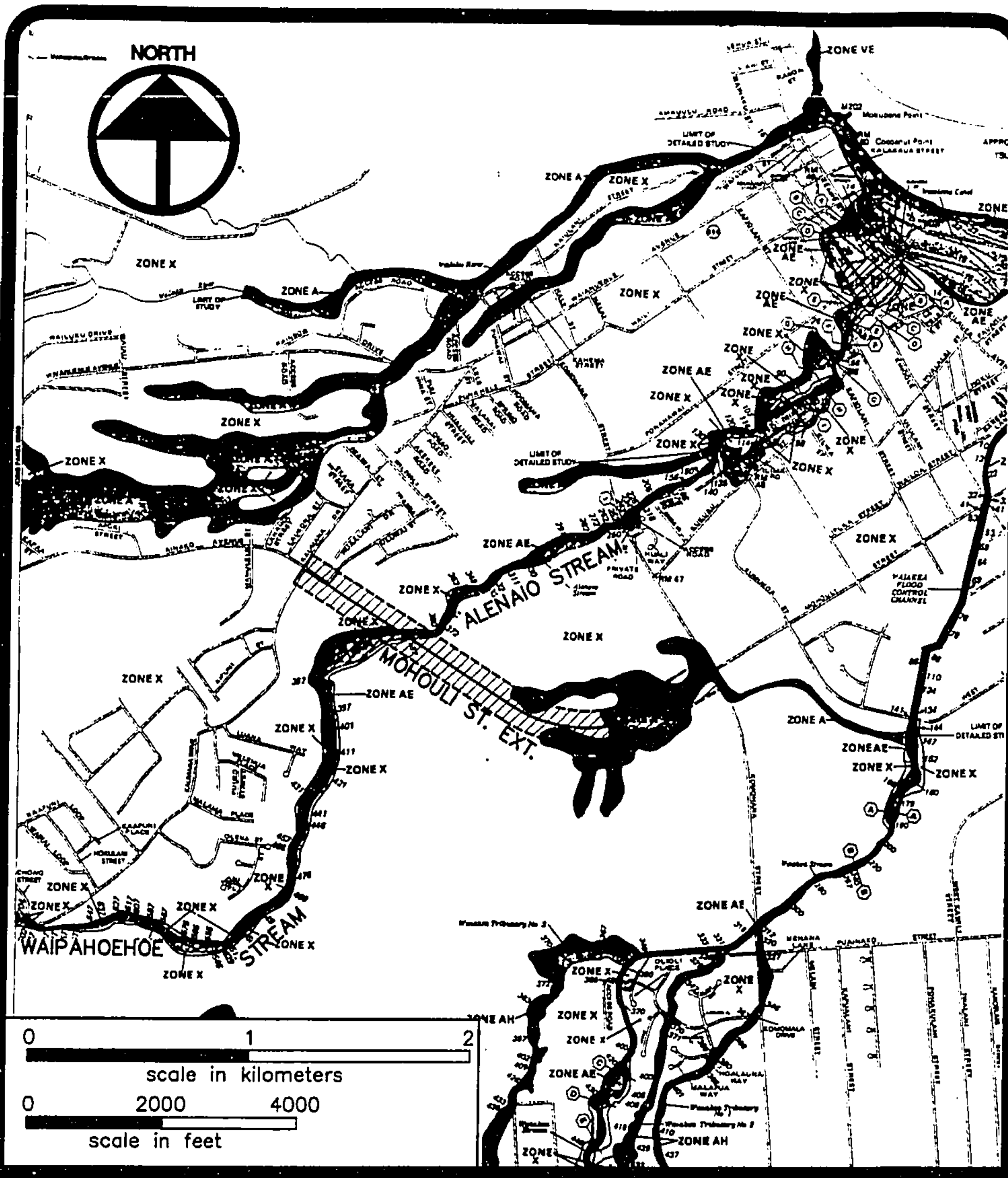
Impacts and Proposed Mitigation Measures

Any roadway that serves Hilo south of the Wailuku River is subject to the hazard of lava flows. There are no practical measures to avoid this impact. The road would, however, provide an alternate escape/access route for Kaumana residents and emergency vehicles during natural disasters or accidents which blocked lower Kaumana Drive.

3.1.2 Hydrology and Floodplains

Existing Environment

The Alenaio Stream system traverses the project corridor (Fig. 3-1). This complex system has repeatedly produced floods in downtown Hilo and is now the subject of a U.S. Army Corps of Engineers flood control project in the reaches downstream from the project area.



TITLE **STREAMS AND FLOODPLAINS** COUNTY OF HAWAII, STATE OF HAWAII	FIGURE 3-1
PROJECT **MOHOULI STREET EXTENSION HILO, HAWAII**	DATE 8/23/96

Alenaio Stream begins as the Kaluiiki and Waipahoehoe Branches approximately 7 km [11 mi.] southwest of the Hilo coastline. These two branches converge above Chong's Bridge at elevation 230 m (800 ft.) above sea level, below which the stream is called Waipahoehoe. After crossing under Chong's Bridge, the stream becomes "undefined" in the areas covered by the 1881 and Kulaloa pahoehoe lava flows. According to geologists, this is because the surface water percolates into these young lavas and is transported laterally in subsurface flow (U.S. Department of the Army 1982). The stream disappears so completely that it is not mapped on USGS topographic maps. Substantial amounts of surface flow over this area occur only during heavy and sustained rainfall (at least 12 cm [5 in.]) per 12 hours). A defined stream does not again emerge until the elevation of Komohana Street, where the name Alenaio Stream is used.

Floodplain status for the project area has been determined by the Federal Emergency Management Agency (FEMA), which has mapped the area as part of the National Flood Insurance Program's Flood Insurance Rate Maps (FIRM) (Fig. 3-1). A summary of applicable Special Flood Hazard Areas (SFHA) designations is as follows:

1. Zone A. SFHAs subject to inundation by the 100-year flood without detailed hydraulic analyses and base flood elevations.
2. Zone AE: SFHAs subject to inundation by the 100-year flood determined in a Flood Insurance Study by detailed methods. Base flood elevations are shown within these zones.
3. Zone AH: SFHAs subject to inundation by 100-year shallow flooding.
4. Zone X: Areas identified in the community flood insurance study as areas of moderate or minimal hazard from the principal source of flood in the area.

A total of approximately 1,000 m (3,200 ft.) of the project corridor traverses three segments of designated flood zones, including a crossing of the Alenaio Stream system (Fig. 3-1). An area of Zone A flood zone is located uphill from Komohana Street, while the Alenaio system is mapped as Zone AE. During 100-year floods, it is estimated that approximately 150 cubic meters per second (5,200 cubic feet per second) pass through this floodway at the project corridor, according to extrapolations from Federal Emergency Management Agency (FEMA) calculations (Source: Okahara and Associates, July 1996). The remainder of the project corridor (and areas immediately upslope and downslope) is contained within Flood Zone X.

Impacts and Mitigation Measures

Road construction projects have the potential, if unmitigated, to adversely and permanently impact drainage. Construction activities such as clearing and grubbing, excavation, and paving alter the natural hydrology. Earthwork may leave soils susceptible to erosion due to rainfall runoff and can cause erosion and sediment pollution. Roadway paving increases the amount of impervious surface area, which has the potential to increase rainfall runoff. In addition, unregulated activities within a floodplain may raise flood levels or alter floodplain boundaries.

Properly designed drainage structures can usually mitigate impacts to essentially zero. Government agencies regulate road construction through various permits to ensure that adverse effects are avoided or mitigated. The following permit procedures will ensure proper mitigation of drainage impacts on the Mohouli Extension:

County Approval of Drainage Plan. The drainage plan for the road will undergo review, revision and approval by the Hawaii County Department of Public Works (DPW) to ensure compliance with standards related to storm runoff containment and activities within designated flood zones. The review will require that all storm runoff is contained onsite as required in the County's *Storm Drainage Standards* (1970). The drainage plan will not be finalized until the road is at a more advanced design state, but is expected to consist of drywells and percolation ponds to handle road runoff. In the designated flood zones, drainage culverts would be installed to pass the runoff beneath the roadway. The location, alignment and hydraulic design of these structures will minimize alteration of the general drainage and flood patterns within the project limits. Approximately 2 ha (5 ac.) surrounding the road corridor in the Alenaio area will be graded to allow proper drainage under the culvert structures.

NPDES. The National Pollutant Discharge Elimination System permit, which would be issued by the Hawaii State Department of Health, would include specific and enforceable conditions to reduce sediment pollution. Temporary mitigation measures such as silt fencing, temporary channels, and sedimentation ponds can minimize such impacts. Section 3.4.1 describes mitigation measures in more detail.

Impacts to the natural and beneficial aspects of the floodplains would be minimal. No streams would be affected in any way. Few native plant species, little wildlife, and no native or valuable aquatic fauna are present. The area is not used for recreation, scientific study, forestry, agriculture, or hunting. The floodplains do have value as open space and as areas for flood moderation and groundwater recharge. The alteration of the natural surface will-consist principally of elevating the area immediately under the right of way and supplying culverts to pass flows during flood events. The ability of the floodplains to moderate floods and recharge groundwater would be essentially undiminished.

3.1.3 Climate and Air Quality

Existing Environment

The climate of Hilo can be described as humid and tropical. Average high temperatures in Hilo vary from approximately 26° Centigrade (78° Fahrenheit [F]) in the winter to 28° C (82° F) in the summer. Temperature lows average approximately 18° C (65° F) in the winter and 21° C (70° F) in the summer. Freezing temperatures or frost do not occur in the project area. Mean annual rainfall in Hilo is estimated at 330 mm (130 in.) Wind is important for its effect on dispersion or concentration of pollutants. Trade winds with an east to northeast direction are present up to 90 percent of summer days and 50 percent of winter days. These winds are generally light, and seldom exceed an average daily speed of 16 km (10 mi.) per hour. At night, a shallow mountain drainage wind from the southwest is usually present except during episodes of strong regional wind. Trades are occasionally replaced by light and variable "*kona*" winds, most often in winter (UH-Manoa Dept. of Geography 1983).

Regional and local climate along with the type and amount of human activity generally dictate air quality of a given location. Federal and state air quality standards limit ambient concentrations of pollutants produced by motor vehicles. These include particulate matter, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone O_3 , and lead. These ambient air quality standards (AAQS) are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR) and Chapter 11-59 of the Hawaii Administrative Rules. Each regulated air pollutant has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time.

The state and federal governments periodically monitor air quality to determine whether it meets AAQ standards. Areas that do not meet standards are termed non-attainment areas and are subject to Conformity Rules. These rules were issued by the Environmental Protection Agency (EPA) in response to Section 176 of the 1977 Clean Air Act. Conformity Rules prohibit any federal agency from engaging in any actions that do not conform to a state's plan to correct nonattainment situations. The entire State of Hawaii is considered to have acceptable air quality and is thus an attainment area not subject to application of Conformity Rules.

Air quality in the project area is currently mostly affected by emissions from motor vehicles, industry and natural sources. Volcanic emissions of sulfur dioxide convert into particulate sulfate which causes a volcanic haze (vog) to blanket the area during occasional episodes when trade winds are not present. The major industrial source is oil-fired power plants which emit SO_2, nitrogen oxides, and particulate matter. Motor vehicles emit CO, nitrogen oxides and hydrocarbons (an ozone precursor), as well as smaller amounts of other pollutants.

The State of Hawaii operates a network of air quality monitoring stations around the state. Very little data are available for the Hilo area. In general, these data indicate that concentrations are well within state and federal air quality standards. The excellent air quality in Hilo is mainly influenced by the dispersive effects of the trade winds and the isolation of the island from any outside sources of pollution. The more stringent state standards pertaining to CO are probably exceeded on occasion near high-volume intersections during periods when traffic congestion and poor dispersion conditions coincide.

Impacts and Mitigation Measures

The roadway essentially provides a shorter alternate route for use by existing traffic and will not generate any additional traffic in the Hilo area. Impacts to regional air quality (which is currently excellent) would probably be somewhat beneficial because of the predicted decrease in congestion and queuing.

However, vehicles traversing the Mohouli Extension would contribute to a long-term increase in air pollution emissions along the actual project corridor - what air quality specialists call microscale impacts. To evaluate the potential impact, an air quality specialist employed computerized emission and atmospheric dispersion models that estimate ambient carbon monoxide (CO) concentrations along roadways leading to and from the project. CO was selected for modeling because it is the most stable and abundant of the pollutants generated by vehicles (see Appendix 2).

Generally speaking, roadway intersections are the primary locations of concern because of vehicular emissions associated with traffic queuing in congested conditions. The study focussed on Mohouli/Komohana and Ainako/Kaumana intersections, because these intersections will be the most affected by the proposed project.

The main objective of the modeling study was to estimate maximum 1-hour and 8-hour CO concentrations for the two intersections at the present (1996) and the future (2020) for both the Build and No-Build Alternatives. Maximum concentrations were calculated for both morning and afternoon peak hours, using the MOBIL5A computer model. The model incorporates terms for traffic volume, average speed, vehicle mix (i.e., different types of motor vehicles and engines), cold/hot start modes (i.e., whether most vehicles will be "warmed up" and burning fuel efficiently), and other factors. After emissions were calculated, a dispersion model (CALINE4) was used to determine how CO would disperse away from the intersection. "Worst case" meteorological conditions (wind speeds of less than 1 meter/second, blowing towards the most sensitive areas) were used in order to arrive at a conservative estimate.

Tables 3-1 and 3-2 provide the results of the analysis.

Table 3-1
Estimated Worst-Case 1-Hour Carbon Monoxide Concentrations
(milligrams per cubic meter)

Roadway Intersections	Year/Alternative					
	1996/Present		2020 No-Build		2020 Build	
	AM	PM	AM	PM	AM	PM
Kaumana Drive at Ainako Avenue	25.2	9.1	18.6	15.4	20.6	16.6
Mohouli Street at Komohana Street	29.3	25.0	30.0	20.7	35.8	28.3

Source: Appendix 2
Notes: Concentrations are estimated for areas 3 m away from traveled portion of roadway at 1.8 m height.
Hawaii State Ambient Air Quality Standard for CO: 10
Federal Ambient Air Quality Standard for CO: 40

As shown in Table 3-1, worst-case carbon monoxide levels at peak hours already exceed Hawaii standards, although they are below federal standards. The 2020 No-Build Alternative would find CO levels increasing, decreasing, or changing only slightly, depending on the intersection and peak period. The 2020 Build Alternative, in general, would involve slight to substantial increases in peak hour concentrations. Both Alternatives produce values exceeding state, and in some cases, federal standards.

Table 3-2 supplies the worst-case 8-hour concentrations for these intersections. Patterns similar to those for the 1-hour case are apparent. Values slightly exceeding both state and federal standards are possible during worst case meteorological conditions at peak hours.

Table 3-2
Estimated Worst-Case 8-Hour Carbon Monoxide Concentrations
(milligrams per cubic meter)

Roadway Intersections	Year/Alternative		
	1996/Present	2020 No-Build	2020 Build
Kaumana Drive at Ainako Avenue	12.6	9.3	10.3
Mohouli Street at Komohana Street	14.7	15.0	17.9

Source: Appendix 2
Notes: Concentrations are estimated for areas 3 m away from traveled portion of roadway at 1.8 m height.
Hawaii State Ambient Air Quality Standard for CO: 5
Federal Ambient Air Quality Standard for CO: 10

The deleterious effects of these potential exceedances are expected to be relatively minor for several reasons. First of all, the estimates are very conservative. A steady wind blowing from one direction at a speed of 1 meter per second is extremely unlikely - occurring once a year or less in Hilo, according to meteorological data. With wind speeds of 2 meters per second, the model predicts that carbon monoxide levels would decrease by half. Secondly, very few pedestrians currently use the sidewalks or shoulders these intersections. The likelihood of anyone occupying the intersection receptor area for as much as one hour during worst case conditions is small. It should also be noted that although the air quality impacts at dozens of intersections indirectly affected by the project were not modeled, it is reasonable to conclude that the overall impact at these intersections will be beneficial, as traffic volumes at the majority of intersections show substantial reductions (see Section 1.3.2). This will be particularly true at Waianuenue Avenue and Komohana Street - the intersection with the highest use by pedestrians.

Mitigation Measures

If sensitive land uses (e.g., University of Hawaii expansion) come to occupy the intersection of Komohana and Mohouli Streets, mitigation measures should be implemented. One is to establish a buffer zones surrounding the intersections in order to isolate sensitive uses from areas in which standards are exceeded. Another potential mitigation measure is to reduce the posted speed limit on Komohana from 72 to 56 km/hour (45 to 35 MPH). Such a reduction would substantially decrease production of CO associated with acceleration after stops.

3.1.4 Noise Levels

Existing Environment

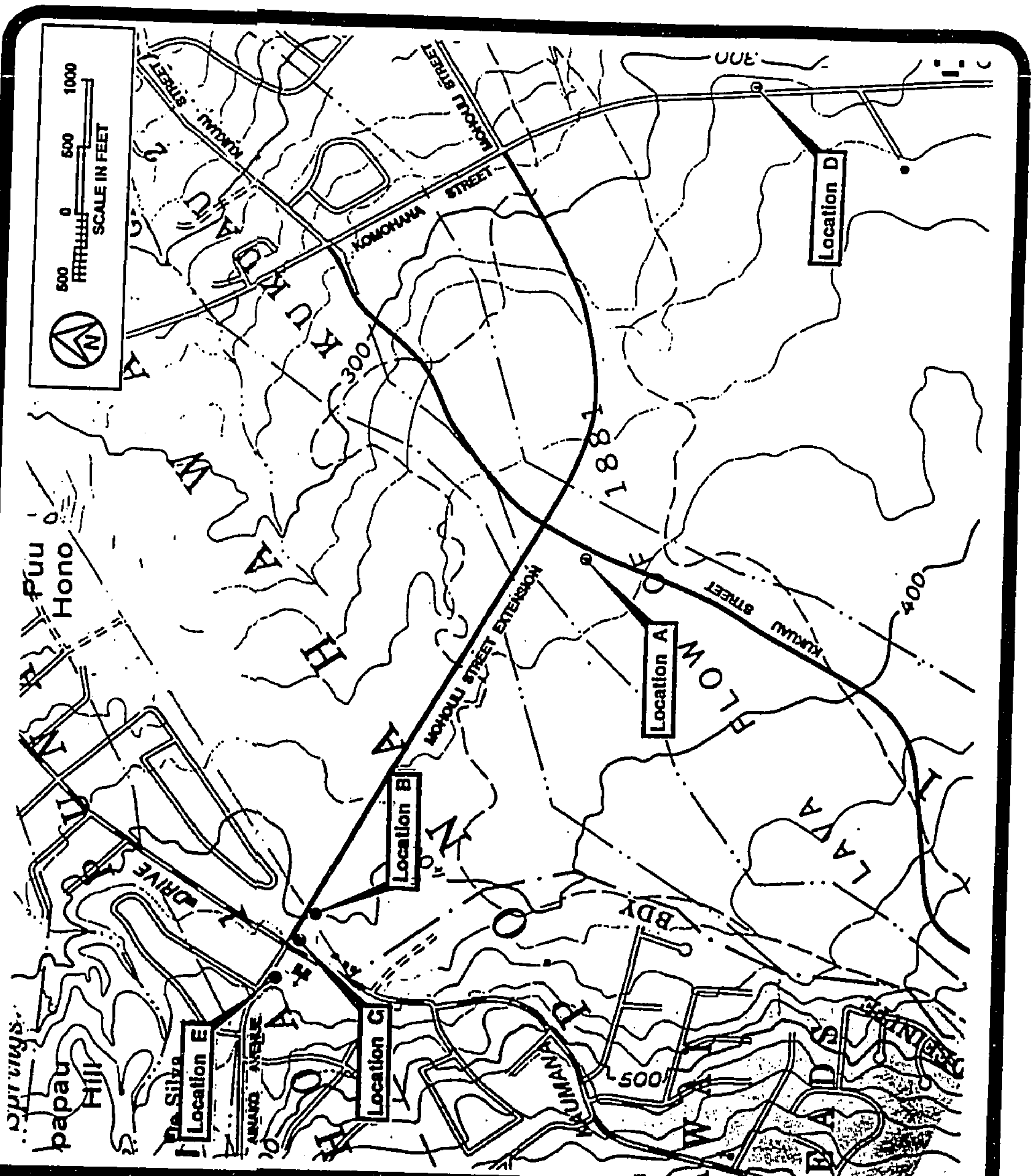
A study of the acoustic environment of the project corridor along with estimates of the effects of both the Build and No Build Alternatives was conducted for this EA (Appendix 3).

Noise may be defined as unwanted sound. Evaluation of noise requires a consideration of loudness at various pitches. Loudness is measured in units called decibels (dB). Since the human ear does not perceive all pitches or frequencies equally, noise levels are adjusted (or weighted) to correspond to human hearing. This adjustment is known as the A-weighted scale, abbreviated dBA. The specific sound level descriptor used in this study is the hourly energy equivalent sound level (L_{eq}) in decibels (dB), which considers the combined effects of all noises near and far and includes background noise and noise fluctuation. Noise levels over 70 decibels are considered unpleasant by most individuals; levels under 50 decibels are generally perceived as acceptably quiet.

The State and federal governments have cooperated on determining acceptable standards of noise (measured in decibels) for various categories of land use. Standards help to assess the existing noise environment and to determine whether the increase in noise associated with a highway project substantially impacts the acoustic environment. They also represent a benchmark goal for mitigation measures when the noise impact of a project unavoidably raises noise levels.

Existing traffic and background ambient A-weighted noise levels were measured at various locations on the corridor (Fig. 3-2). Measurements determined that existing traffic noise levels along the corridor are generally low, typically less than 57 L_{eq}. In these areas, local or distant highway traffic, birds, dogs, and wind-rustled foliage tend to be the dominant noise sources.

The acoustical study used existing traffic noise measurements to develop and calibrate a model that projected future traffic noise levels associated with the proposed project under the No-Build and various improvement alternatives. The FHWA Traffic Noise Prediction Model was the primary method. The model incorporates parameters for terrain, ground cover, and local shielding conditions. The agreement between measured and predicted traffic noise levels is illustrated in Table 3-3. The agreement confirmed that the traffic model could consistently and accurately predict future traffic noise levels.



TITLE	NOISE MEASUREMENT SITES COUNTY OF HAWAII, STATE OF HAWAII	FIGURE 3-2
PROJECT	MOHOULI STREET EXTENSION HILO, HAWAII	DATE 8/23/96

Table 3-3
Traffic Noise Measurements and Model Predictions, Selected Sites

LOCATION	Measured L_{eq}	Predicted L_{eq}	LOCATION	Measured L_{eq}	Predicted L_{eq}
C: 50 feet from centerline of Kaumana Dr.	64.6	64.5	D: 50 feet from centerline of Komohana St.	67.3	67.1
E: 50 feet from centerline of Ainako Ave.	56.1	56.0			

Source: Appendix 3, Table 1

Impacts and Mitigation Measures

Two standards of increase in noise levels are used to determine whether noise impacts have occurred and noise mitigation measures should be considered. One is whether the FHWA noise abatement criterion of 67 L_{eq} for residences, schools, churches, and similar land uses (U.S. Department of Transportation Policy and Procedure Memorandum 90-2) is exceeded or "approached," which is defined in Hawaii as 66 L_{eq} or greater. The second standard is the State DOT policy that defines any difference of 15 dB or greater between existing and predicted noise levels at the project year of 2020 as a "substantial" increase. If either standard is exceeded, "reasonable and feasible" mitigation measures must be considered.

The *No-Build Alternative* would result in increases of 1.4 to 3.0 dB along Komohana Street and along the section of Ainako Avenue west of Kaumana Drive. Along Kaumana Drive, Mohouli Street and Ainako Avenue east of Kaumana Drive, relatively small increases in traffic noise levels of 0.2 to 0.8 dB are expected. The increase would occur because of the expected increase in traffic volume.

Under the *Build Alternative*, slight traffic noise increases would occur along the existing section of Mohouli Street east of Komohana Street and along Ainako Avenue on both sides of Kaumana Drive (south of Ainako Avenue). Traffic noise levels are predicted to decrease along Kaumana Drive north of Ainako Avenue and along Komohana Street north of Mohouli Street. Larger increases are expected near the Kukuau Street and Uluwai Street intersections with Mohouli Street. The magnitudes of the increases do not exceed federal or state standards.

In essence, the proposed project would redistribute future traffic noise from the lower sections of Kaumana Drive and Komohana Street to locations along the Mohouli Street Extension.

Construction of the project as planned should not result in traffic noise which exceeds FHWA or Hawaii State DOT noise standards or noise abatement criteria. Therefore, traffic noise mitigation measures should not be required.

3.2 Biological Environment

The County of Hawaii consulted the U.S. Fish and Wildlife Service (USF&WS) for information on the distribution of rare or endangered plants and animals and for advice on mitigation of impacts (see Section 4.3 for coordination letter). In accordance with recommendations from this agency, a biologist performed an intensive survey of the corridor in early 1996, focussing on endangered or threatened plant or animal species and habitat (see Appendix 4 for full report).

3.2.1 Terrestrial Vegetation and Fauna

Existing Environment

Vegetation along the project corridor consists of two communities. About half the length is low-stature forest dominated by the native ʻohiʻa lehua (Metrosideros polymorpha var. incana) and the mat-forming fern, uluhe (Dicranopteris linearis). The other half is abandoned agricultural lands now covered with thick mats of introduced grasses and scattered thickets of introduced trees. A total of eighty species were recorded on the corridor. No plants listed, or proposed for listing, as threatened or endangered by USF&WS were found within or near the right-of-way.

No endangered or otherwise rare bird or mammal species were observed within the project area. However, it is possible that several species of native birds forage or fly over the site, including the Hawaiian hawk or ʻio (Buteo solitarius). Foraging habitat for Hawaii's only land mammal, Lasiurus cinereus semotus (the ʻopeʻapeʻa or Hawaiian hoary bat), may also be present. Both are listed endangered species. According to USF&WS, two listed endangered seabirds, the dark-rumped petrel (Pterodrama phaeopygia sandwichensis) and Newell's shearwater (Puffinus auricularis) may traverse the area.

Impacts and Proposed Mitigation Measures

No substantial impacts to plant species or communities are expected. In order to prevent possible impact to the dark-rumped petrel and Newell's shearwater resulting from disorientation related to street lighting, USF&WS recommended that consideration be given to shielding street lighting to prevent lights from shining upward. In order to ensure compliance with this recommendation, the County of Hawaii will forward lighting plans to the USF&WS for review and approval.

It is unlikely that any adverse impact upon bats or hawks would result from the proposed project, as no nests and roosts appear to be currently present. However, should 'io nests or bat roosts be found during construction on the roadway, activities in the immediate area will be suspended until contact is made with the Protection Forester, Division of Forestry and Wildlife (DOFAW) in Hilo and the Endangered Species Office of USF&WS in Honolulu. Construction will not resume until completion of mitigation required by these agencies.

3.2.2 Wetlands

Existing Environment

Wetland indicators are present in two locations on small areas of the corridor. Distinct, poorly drained sites with clear wetland indicators, occupying less than 300 sq. meters (3,000 sq. ft.), are present near Komohana Street on 1881 pahoehoe lava. An irregular collection of pockets with wetlands conditions totaling approximately 670 sq. meters (7,100 sq. ft) is present near Alenaio Stream. Total estimated wetlands area is 970 sq. meters (10,100 sq. ft).

Impacts and Mitigation Measures

The wetlands near Komohana Street would be filled by the roadway, and wetlands near Alenaio Stream would be disturbed through grading in order to lower its elevation, and then allowed to naturally revegetate and reassume its wetland function. The project was granted a provisional Department of the Army Nationwide Permit for dredge and fill in the waters of the United States on September 9, 1996 (see Section 4.3 for full text of permit and conditions). The County of Hawaii will perform the following mitigation measures, among others, as specified in the permit:

- Obtain a Section 401 Water Quality Certification or waiver thereof from the Hawaii State Department of Health;
- Provide adequate drainage through the wetland areas;
- Significant earth-moving activities will occur only during periods of no or low rainfall; the County of Hawaii will make every effort to conduct construction activities during the "dry season" (May through September);

- o Construction activities will be conducted in a manner as to minimize and control erosion and sedimentation;
- o All fill and other construction material will be clean, uncontaminated and free of deleterious substances, including toxic chemical, debris and fine grained material;
- o Particular care will be taken to ensure that no petroleum products, trash or other debris enter the water;
- o No construction or excavated materials will be stockpiled in the aquatic environment.

The USF&WS concurred with the determination by the U.S. Army Corps of Engineers that the existing functions of the wetland are primarily hydrological and that no biological mitigation was necessary (see letter of 12 February 1997, Section 4.3).

Due to a periodic review of all Nationwide Permits, this permit elapsed on January 21, 1997. A request for reauthorization has been filed and is anticipated to be granted with no further conditions. Subsequent to the original permit, the 670 sq. meters of wetlands near Alenaio Stream has been delineated and will be evaluated in the renewed permit application.

3.2.3 Aquatic Habitat

Existing Environment

In accordance with USF&WS recommendations, a survey of Alenaio Stream was conducted to determine if any permanent pools with the potential to support category 1 endangered damselflies (Megalagrion pacificum and M. xanthomelas) or the native fish and crustaceans were present.

Ground survey determined that no ponds, permanent streams, or intermittent stream channels with frequent flowing or standing water are located in the project corridor. Although Alenaio Stream is often depicted on maps as traversing the project area, no distinct channels are present and stream features are rudimentary. No features offering aquatic habitat for native or introduced aquatic fauna are present.

The portions of the Alenaio Stream downslope of the project area, along with Waiakea Pond into which the stream empties, do support native aquatic organisms. These include several diadramous (requiring both fresh and salt water during different parts of their life-cycles) species belonging to the goboid fishes (e.g, o'opu nakea, Awaous stamineus) and crustaceans ('opae). Other native aquatic fauna in waters below the project area include crabs, a dragonfly (Anax junius), and bristleworms. Many alien species such as tilapia (Sarothendron, Oreochromis spp.), guppies (Poecilia spp.) and mosquito fish (Gambusia affinis) are also present.

The *Hawaii Stream Assessment* (Hawaii State CWRM 1990) inventoried state streams for their resources, habitat, cultural and recreational value. The streams which feed the Waiakea Pond are largely channelized or artificially modified. Pollution associated with urban runoff and former industrial use is present. Although it is not assessed as an outstanding or substantial riparian habitat, it contains several native aquatic species and is considered part of the essential habitat for the recovery of endangered species and native ecosystems. Stabilization and improvement of water quality in the Wailoa River are vital for the preservation of native species habitat.

Above the project area, hydrological conditions in the Alenaio Stream are such that pools of running or standing water persist for long periods after rainfall. According to aquatic studies conducted as part of a U.S. Army Corps of Engineers evaluation of the Alenaio drainage basin in 1982, various alien organisms including the Tahitian prawn (Macrobrachium lar) are sometimes found above the project area.

Impacts and Mitigation Measures

The area directly affected by the project lacks aquatic habitat. Impacts to aquatic habitat downstream of the proposed project will be avoided by adhering to the best management practices specified in the NPDES permit to which the project will be subject.

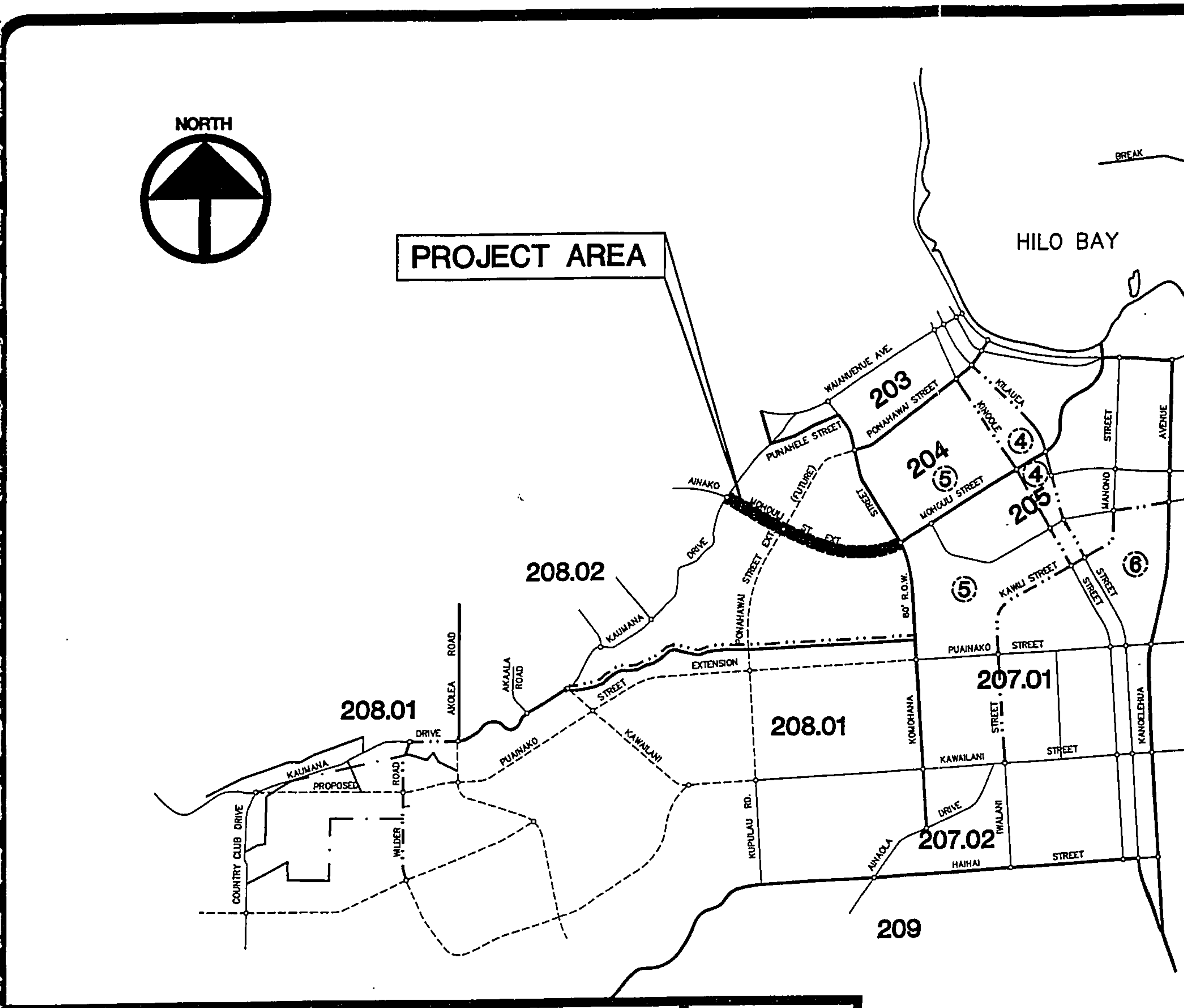
3.3 Socioeconomic

3.3.1 Demographics and Community Identity

Existing Environment

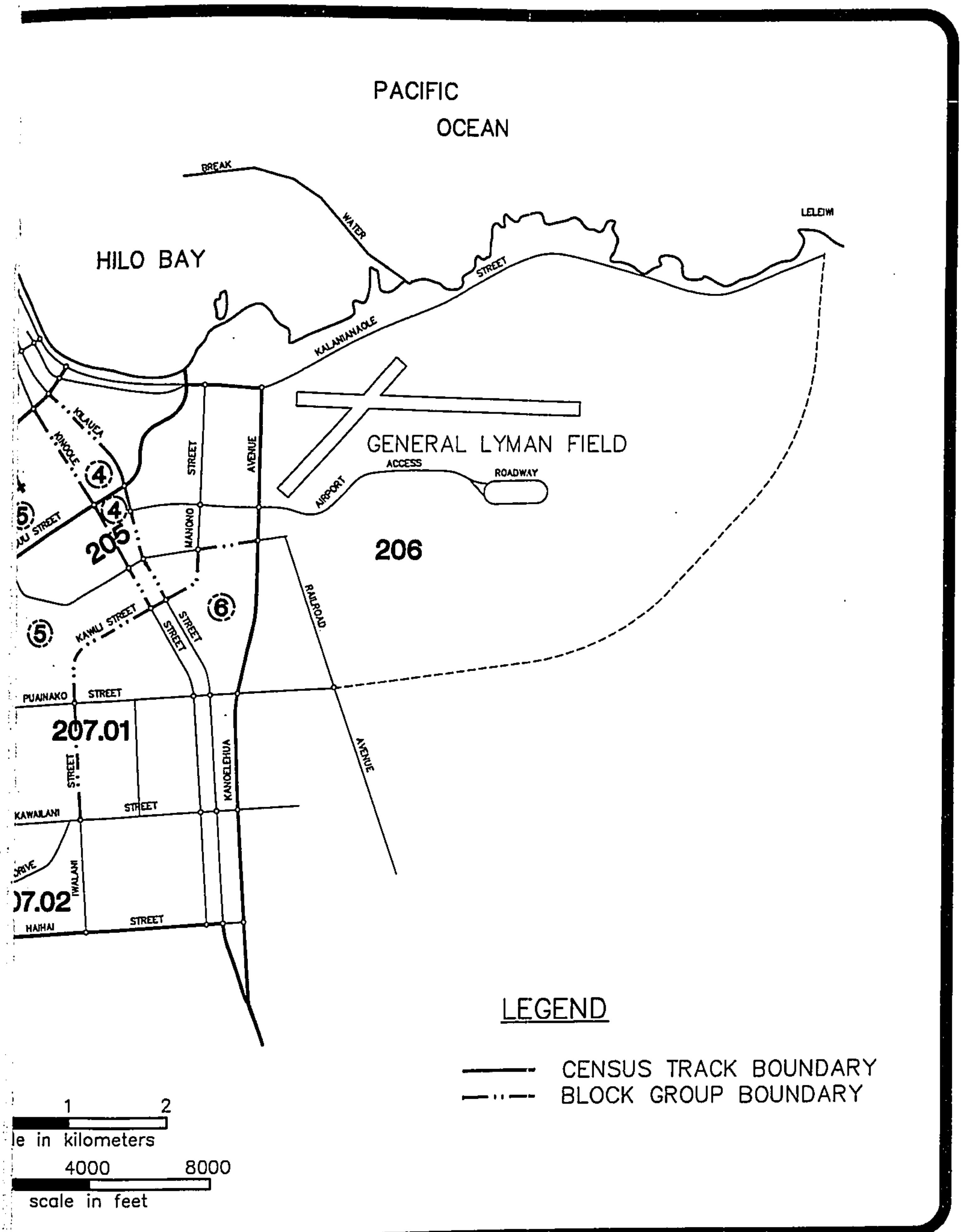
The Mohouli Extension would cross the developing neighborhood of Sunrise Ridge. It would connect the older communities of Lower Kaumana/Ainako with the existing Mohouli Street (Fig. 3-3). All of the neighborhoods are essentially residential. None has a distinct area of central focus such as a local shopping district, community center or park. The presence of community associations in each neighborhood, however, testifies to a sense of community.

The 1990 U.S. Census of Population provides the most recent demographic information. The census data are still reasonably accurate for Hilo in 1997, although the neighborhood of Sunrise Ridge has at least doubled in population since that time.



TITLE **PROJECT AREA CENSUS TRACTS** AND BLOCK GROUPS	FIGURE 3-3
PROJECT MOHOULI STREET EXTENSION HILO, HAWAII	DATE 8/23/96

0 1 2
scale in kilometers
0 4000 8000
scale in feet



PACIFIC
OCEAN
HILO BAY
BREAK
WATER
LELEIWI
STREET
KALANIANAOLE
GENERAL LYMAN FIELD
AIRPORT
ACCESS
ROADWAY
STREET
AVENUE
MAHONO
KILAUEA
KINOOLE
4
4
5
5
5
6
205
206
RAILROAD
AVENUE
KAWILI STREET
STREET
STREET
PUAINAKO
STREET
207.01
STREET
KANOELEHUA
KAWAILANI
STREET
DRIVE
IWALANI
7.02
HAIHAI
STREET
LEGEND
CENSUS TRACK BOUNDARY
BLOCK GROUP BOUNDARY
1
2
le in kilometers
4000
8000
scale in feet

Table 3-1 presents demographic data for the block groups that compose the individual neighborhoods, for the larger census tracts, and for the entire city of Hilo. Very little difference exists among the various groups affected in some way by the project in most demographic categories. The neighborhood through which the proposed project actually passes is near the average in most measures.

Impacts and Mitigation Measures

No relocation of residences, businesses, community organizations or farms would occur because of the project. Although the Mohouli Extension would cross Kukuau Street, the central thoroughfare in Sunrise Ridge, the scale of the right-of-way and traffic volumes are modest and would not impose a barrier across the community. No effects on community identity or cohesion would occur in Sunrise Ridge, or in the Mohouli and Ainako areas less directly affected by the project. No disadvantaged groups are disproportionately represented in the area directly or indirectly affected by construction-phase impacts, right-of-way taking, long-term noise and air quality effects, and similar direct impacts.

3.3.2 Planning

Planning responsibility for the Island of Hawaii rests with the Hawaii County Planning Department and the State Land Use Commission.

Hawaii County General Plan

The General Plan for the County of Hawaii is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawaii. The Mohouli Extension has been part of County planning since the late 1950s, including the General Plan of 1967 and the Hilo Community Development Plan of 1975 (Belt, Collins and Assoc.). Right-of-way reservation has been required in subdivisions and public projects since that time. The current General Plan was adopted by ordinance in 1989.

General Plan Facilities and LUPAG Maps

These map components of the General Plan together establish the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors.

The Facilities map of the General Plan identifies existing and proposed roads and existing facilities. The Mohouli Extension is identified on the Facilities Maps as a proposed Secondary Arterial. The General Plan defines such roads as streets of considerable continuity which are primarily traffic arteries for intercommunication between or through large areas. They interconnect with and augment primary systems.

Table 3-4
Demographic Characteristics of Project Area Census Subdivisions

Census Tract (Block Group) Description	Population	Persons/ Household	Ethnic Characteristics (in percent)	Percent Hawaiian	Median Home Value	COMMENTS
Census Tract 205 (4) Mohouli Street (South Side - Lower)	444	2.72	Asia/Pac: 70.0 White 25.5 Other 4.5	22.0	$110,600	Residents facing Mohouli Street will experience increase in traffic
Census Tract 205 (5) Mohouli Street (South Side - Upper)	1,745	2.77	Asia/Pac: 70.0 White 25.5 Other 4.5	17.1	$123,800	Residents facing Mohouli Street will experience increase in traffic.
Census Tract 204 (4) Mohouli Street (North Side - Lower)	558	2.27	Asia/Pac: 75.2 White 20.6 Other 4.1	39.0	$83,300	Least affected block group.
Census Tract 204 (5) Mohouli Street (North Side - Upper)	1,371	3.26	Asia/Pac: 70.5 White 24.3 Other 5.3	29.7	$79,800	Residents facing Mohouli Street will experience increase in traffic
Census Tract 208.02 Lower Kaumana, Ainako, Sunrise Ridge	5,081	2.91	Asia/Pac: 65.6 White 30.0 Other 4.4	12.9	$108,800	Area most directly affected (new road through Sunrise Estates) and most benefit (shortcut for Ainako and Kaumana residents).
Census Tract 208.01 Upper Kaumana	3,062	3.53	Asia/Pac: 69.7 White 28.1 Other 2.9	14.0	$114,500	Project will beneficially impact residents.
City of Hilo	37,808	2.86	Asia/Pac: 64.7 White 26.6 Other 8.7	20.0	$84,700	Project would benefit traffic flow in Hilo as a whole.

Sources: U.S. Bureau of the Census: "1990 Census of Population. General Population Characteristics," 1990 CP-1-13.
Notes: Asia/Pac = Asian or Pacific Islander;

The Land Use Pattern Allocation Guide (LUPAG) map is a graphic representation of the Plan's goals and policies. Land surrounding the project corridor is identified for University Use, Low Density Urban Expansion, Medium Density Urban Expansion, Urban Expansion (density unspecified), and Floodplain Uses.

County Zoning

County zoning for properties along the project corridor varies from 1-acre Agriculture (A-1a) to 7,500 and 10,000 square feet Residential (RS-7.5; RS-10). The proposed project is a permitted use in all these zones.

State Land Use District

All land in the State of Hawaii is classified into one of four land use categories -- Urban, Rural, Agricultural, or Conservation -- by the State Land Use Commission. The project corridor is designated Urban near Kaumana Drive and Agriculture in the Kukuau to Komohana portion of the corridor. The proposed project would be an identified use in both of these districts.

Impact of Project on Planning

The proposed project is consistent with all planning. No rezoning, reclassification or use permits are required.

3.3.3 Land Use

Existing Land Use

Existing land use in the project area consists primarily of open space, with residential use adjacent to Kukuau Street and near Kaumana Drive. Near Komohana Street, the corridor lands that are currently vacant but have been reserved for expansion of the University of Hawaii at Hilo by the State of Hawaii.

The land through which the road would pass is owned mostly by the State of Hawaii, with several sections belonging to various private landowners. A proposed right-of-way across all affected parcels has been depicted on all planning maps for several decades.

Impacts and Mitigation Measures

In conformance with the road's designation in the General Plan, the County of Hawaii will impose access controls on future developments along the corridor. No adverse impacts to existing or proposed land uses would result from the project. The Mohouli Extension would not interfere with future University expansion plans.

3.3.4 Public Services and Facilities

Utilities

A new water line will be installed within the right-of-way, under the paved travel way per Hawaii County Department of Water Supply (DWS) standards. The 30 cm (12 in.) line will connect existing mains on Komohana Street, Kukuau Street, and Ainako Street.

There are no plans to install electrical or telephone lines along the Mohouli Extension. Electricity for street lights and signal lights at intersections will be available from existing power lines at the intersections.

Police, Fire and Emergency

Response time for police, fire and emergency medical services will be reduced.

Other Services

No schools are located in or near the project corridor. School buses are expected to take advantage of the new route. No recreational facilities are located in or near the project corridor, and no impact to recreation would occur.

3.3.5 Historic Sites/Archaeological Resources

Section 106 of the National Historic Preservation Act provides protection for historic sites. This law designates the State Historic Preservation Officer (SHPO) in each state as the entity responsible for coordination and consultation on historic sites.

An archaeological inventory survey of a 200-foot wide corridor centered on the right-of-way determined that no archaeological features were present. The SHPO issued a letter on 25 June 1996 concurring with this determination and stating that no effects to significant historic sites would occur as a result of the road construction (see Section 4.3 for coordination letter).

Late in project planning, it was determined that an additional area totaling approximately 2 ha (5 ac.) near Alenaio Stream would require disturbance in order to achieve proper drainage (see Fig. 1-1). An archaeological inventory survey concluding that no historic sites were present has already been conducted (Jensen 1991) as part of an unrelated project. The report was approved by the SHPO. The County of Hawaii has coordinated verbally with the SHPO and has received preliminary assurances that the determination of no adverse effect upon significant historic sites will be maintained. When the official letter is received, it will be added to the environmental documentation file.

3.3.6 Agricultural Land

The federal Farmland Protection Policy Act (FPPA) seeks to conserve farms and farmland by requiring assessment of a highway project's relative impact on farmland in a region, county and state. Consultation of maps of important farmland provided by the U.S. Natural Resources Conservation Service (USNRCS) determined that no lands identified as Prime, Unique, or Other Important Lands in the *Agricultural Lands of Importance to the State of Hawaii* (ALISH) map series are present. Field inspection determined that no farms are present within the corridor. No farming operations would be adversely impacted by the project.

3.3.7 Motorized Vehicle Transportation Patterns

[In the interest of avoiding redundancy, the reader is referred to Section 1.2 for maps, tables, and detailed discussion of traffic conditions under the Build and No-Build Alternatives.]

Existing Conditions

Currently motorists traveling between Kaumana and most other destinations in Hilo (including the University, airport, and major shopping districts) must detour via Waianuenue Avenue or Punahele Street, and then to Komohana Street, in order to access their destinations (Fig. 1-1). Traffic is often congested at the intersections of Waianuenue Avenue and Punahele Street with Komohana Street the during the AM and PM peak hours. The current strategy of one-way, downhill traffic flow on Waianuenue Avenue on weekday mornings eases congestion for Hilo-bound traffic but imposes delays and forces circuitous routes on uphill-bound traffic. Afternoon traffic congestion is spread out over a longer time period.

Impacts of the No-Build Alternative and Proposed Mitigation Measures

Under the No-Build Alternative, the congestion currently experienced at the intersections of Waianuenue Avenue and Punahele Street with Komohana Street would worsen to levels that would exceed the capacity of current intersections. Long delays and queues would be experienced, particularly during AM and PM peak periods.

Conversely, traffic on the existing Mohouli Street would be approximately one-third less than under the Build Alternative.

No practical mitigation measures are envisioned for the congestion impacts associated with the No-Build Alternative. A Traffic System Management technique of AM peak hour one-way traffic flow is already in place. Right-of-way for expansion of lanes on either Waianuenue Avenue or Punahele Street would be prohibitively expensive because of the hundreds of structures affected.

Impacts of the Build Alternative and Proposed Mitigation Measures

Overall, the improvements would allow traffic a more direct route to its destination and would reduce traffic on roadway segments that have numerous street and driveway access points, are over-capacity, above average in accident rates, and problematic to widen.

The Build Alternative would divert more than 15,000 vehicles per day from the intersections of Waianuenue Avenue and Punahele Street with Komohana Street (see Figure 1-1). According to the traffic analysis performed for the project, this diversion would reduce traffic to levels well within the capacity of existing intersections to handle traffic flow (see Table 1-1). The improvements would improve traffic flow to the extent that the one-way pattern on Waianuenue could be discontinued with the intersections still operating under capacity. The intersections of Komohana Street with Kukuau and Ponahawai Streets would continue to produce acceptable Levels of Service.

However, traffic on the existing Mohouli Street would increase by 4,000 vehicles per day, approximately 50 percent greater than under the No Build Alternative. A smaller increase would occur on Ponahawai St - about 250 vehicles per day, 20 percent greater than the No Build estimate. A very small increase - about 3 percent - is predicted for Kaumana Drive above Ainako Avenue.

In response to current deficiencies and the expected traffic increases, the County of Hawaii has anticipated the need for mitigation measures. Planned for inclusion in the federally approved Statewide Transportation Improvement Programs (STIPs) for fiscal years 1997-1998 and 1998-2000 is a project to upgrade of Mohouli Street by widening, installing curbs, gutters and sidewalks, and supplying a traffic signal at the Kumukoa Street intersection. Included in the STIP is a project to install a traffic signal at the T-intersection of Ponahawai and Komohana Streets. These improvements will substantially mitigate increases to traffic resulting from the proposed project.

The narrow right-of-way and steep slopes adjacent to Kaumana Drive make widening extremely problematic. It is not practical to perform any substantial widening of Kaumana Drive above Ainako Avenue. Over the long term, the strategy adopted in the Hawaii County General Plan is to relieve traffic via a series of feeder roads - of which the Mohouli Extension and the Puainako Extension are examples (see Fig. 3-3). Future projects that are not yet in active planning are the Kupulau/Ponahawai Extension and a connection between Edita Street and Kukuau Street through Pacific Plantations.

3.3.8 Pedestrian and Bicycle Transportation Patterns

Existing Conditions

Adequate sidewalks or wide paved swales are currently present on most segments of the affected roadways with the exception of Punahele and Mohouli Streets. Of all sections in the project area, pedestrian use is heaviest near the intersection of Waianuenue Avenue and Komohana Street, as this area is near Hilo High School and Carvalho County Park and Gymnasium. Kukuau Street's quiet conditions and broad swales provide attractive walking conditions for residents of Sunrise Ridge.

The *Bike Plan Hawaii* (HDOT 1994) serves as the guide for implementation of bikeways for the State of Hawaii. According to this plan, no designated bikeways exist in the project area. Future proposed improvements include bike lanes on Mohouli and Komohana Streets and a bike route on Waianuenue Avenue.[2] Bicycle traffic is currently not monitored in the project area but does not appear to be substantial.

Impacts and Proposed Mitigation Measures

In order to accommodate both pedestrians and bicyclists, the shoulders will be used as non-exclusive bike paths. The Mohouli Extension is not likely to have many pedestrians. Unlike the existing Mohouli Street, no businesses, homes or residential lots will face the Extension. For residents of Lower Kaumana and Sunrise Ridge, there are alternate routes downhill - Kukuau Street, with its wide shoulders with little traffic, and Waianuenue Avenue, with sidewalks - that provide much better walking conditions. For this reason, no separate sidewalks have been proposed. Use by bicyclists may be more common, as Mohouli Street will provide a shortcut to the University of Hawaii at Hilo from the Kaumana/Ainako areas.

Streets other than Mohouli will be affected indirectly. The proposed project would divert traffic away from many streets that currently exhibit moderate levels of pedestrian and bicycle use (e.g., Waianuenue Ave.), improving conditions in these locations. On the existing section of Mohouli Street, which currently has narrow shoulders and no sidewalks, pedestrian and bicycling conditions would degrade because of the increase in motorized traffic.

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[2] The Hawaii State Department of Transportation defines a **bike lane** as "A portion of a roadway designated by striping, signing, and pavement markings for the preferential or exclusive use of bicycles." A **bike path**, by contrast, is completely separated from the roadway and is normally exclusively for bicycles. A **bike route** is defined as "Any street or highway so designated, for the shared use of bicycles and motor vehicles or pedestrians or both."

Mitigation for impacts to pedestrians and bicyclists is as follows:

- o Extension will have wide, adequately sloped shoulders for bicycles and pedestrians (see Fig. 1-3), conforming to Americans with Disabilities Act specifications; County will aim for similar standards in future improvements to existing Mohouli Street.

3.3.9 Growth-Inducing, Cumulative and Secondary Impacts

Four properties (two owned by the State of Hawaii) are traversed by the proposed project. All are currently vacant or not fully utilized. Each of these parcels already possesses the access it requires for development in conformance with zoned and permitted uses. All four properties are accessible by three or more streets in addition to the Mohouli Extension. The proposed project would not, therefore, bestow or markedly improve access on any property and thus provide the key for development. Thus, the potential for growth-induction along the project corridor is negligible.

Cumulative impacts result when implementation of several project that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project are very limited in severity and geographic scale. There are no projects being undertaken nearby which would combine with the Mohouli Extension to produce cumulative impacts.

When road construction projects create or substantially accelerate new opportunities for urban growth, secondary or induced physical and social impacts may also occur. These can include impacts to air quality, water quality, noise, open space, natural vegetation, historic sites, demands for public infrastructure, and other aspects of the environment. Because the project is not expected to generate growth, such secondary impacts would not occur.

3.3.10 Coastal Zone Management Act (CZMA)

The purpose of the federal Coastal Zone Management Act (CZMA) of 1972 (U.S.C. 1451-1464) is to preserve, protect, develop and where possible enhance the resources of the coastal zone. All projects with federal involvement that significantly affect areas under the control of the State Coastal Zone Management Agency must undergo review for consistency with the State's approved coastal program. The entire State of Hawaii is included in the coastal zone for such purposes.

The objectives of the Hawaii Coastal Zone Management Program are the following:

Recreational Resources: Provide coastal recreational opportunities accessible to the public.
Historic Resources: Protect, preserve, and where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone that are significant in Hawaiian and American history and culture.
Scenic and Open Space Resources. Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.
Coastal Ecosystems. Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.
Economic Uses. Provide public or private facilities and improvements important to the State's economy in suitable locations.
Coastal Hazards. Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence.
Managing Development. Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

The project does not impact these coastal zone resources and is consistent with the objectives of the program, as determined by the Hawaii Office of State Planning, the agency entrusted with administering the Hawaii Coastal Zone Management Program (see Section 4.3 for consistency determination letter).

3.4 Construction-Phase Impacts

Construction of the proposed project would last approximately one year. During this period construction vehicles, power tools and heavy equipment would generate noise, traffic congestion, exhaust emissions and the potential for soil erosion.

A total of ten residences or lots - six on Ainako Avenue near Uluwai Street (only two with access frontage on Ainako itself), and four on Kukuau Street (none with access frontage on Mohouli; all but one vacant) - would be most directly affected by construction, since they are adjacent to the roadway.

3.4.1 Sediments, Water Quality and Flooding

Impacts

Uncontrolled excess sediment from soil erosion during and after road construction can impact natural watercourses, water quality and flooding potential. Contaminants associated with heavy equipment and other sources during construction may also impact receiving stream, ocean and ground water.

Proposed Mitigation Measures

Because of the scale of the project, a National Pollutant Discharge Elimination System (NPDES) permit would be required for the construction phase of the project. The permit, which would be issued by the Hawaii State Department of Health, would include specific and enforceable conditions to reduce sediment pollution.

If the Build Alternative is selected, provisions would be made during the construction grading and earthwork to minimize the potential for soil erosion and off-site sediment transport. Best Management Practices (BMPs) such as standard soil erosion and sediment control shall be implemented, as described in the *Erosion and Sediment Control Guide for Hawaii* (USSCS 1981). These management measures could include:

- Timing construction activities, such as grading or the installation of culverts, during periods of minimum rainfall;
- Limiting the amount of surface area graded at any given time to reduce the area subject to potential erosion;
- Constructing temporary drainage ditches to divert runoff away from areas susceptible to soil erosion;
- Utilizing soil erosion protective materials such as mulch or geotextiles on areas where soils have a high potential for erosion until permanent provisions such as lawns and grasses can be developed.
- Planting grass as soon as grading operations permit to minimize the amount of time soils are exposed to possible erosion; and
- Building sedimentation basins to collect sediment which enters runoff waters.

3.4.2 Air Quality

Impacts

Short-term air quality impacts would occur either directly or indirectly during project construction. Short-term impacts from fugitive dust would likely occur, and increased emissions from traffic disruption may also affect air quality during construction. State air pollution control regulations prohibit visible emissions of fugitive dust.

Mitigation

An effective dust control plan is necessary to mitigate construction-related impacts. Elements of the plan, which would be approved by DOH, would include some or all of the following:

- Watering of active work areas;
- Wind screens;
- Cleaning adjacent paved roads affected by construction;
- Covering of open-bodied trucks carrying soil or rock;
- Limiting area to be disturbed at any given time;
- Mulching or chemically stabilizing inactive areas that have been worked; and
- Paving and landscaping of project areas as soon as practical in the construction schedule.

The high rainfall of the project area should serve to naturally control construction dust, but it is recommended that during prolonged dry periods, active work areas be watered at least twice daily.

Construction vehicles and disrupted traffic due to construction activity can also produce increased exhaust emissions. This can be partially mitigated by moving construction equipment and workers on and off the site during off-peak traffic hours and by minimizing road closures during peak traffic hours.

3.4.3 Noise

Impacts

Construction would result in noise from grading, blasting, compressors, vehicle and equipment engines, and other sources. Construction activities may exceed 95 decibels (dB) at the project boundary lines at times.

Mitigation

The State of Hawaii requires contractors engaged in road construction activities to conform with Title 11, Chapter 46, HAR (Community Noise Control). The Hawaii State Department of Health's (HDOH) Noise, Radiation and Indoor Air Quality Branch issues permits for construction activities which may generate noise. The permit is applied for during the construction phase by the contractor. HDOH will review the type of activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures. Possible measures include restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers. The precise combination of mitigation measures, if any, shall be specified by HDOH prior to construction.

3.4.4 Traffic Congestion

Impacts

For short intervals during the construction period, operation of construction equipment, trucks, and worker vehicles may temporarily impede traffic at the intersections of Mohouli Street with Komohana Street, Kukuau Street, Uluwai Street and Kaumana Drive. Low traffic volumes and/or the availability of alternate access and travel routes at Uluwai and Kukuau Streets will prevent substantial problems.

Mitigation

During the short periods when the intersections of Mohouli Street with Komohana Street and Kaumana Drive will be undergoing construction, the intersections will remain open during the AM and PM peak hours, i.e., from 7:00-8:00 AM and between 4:00 - 5:00 PM. Noise-related restrictions may be imposed by the Hawaii State Department of Health for construction near the six residences near Uluwai Street. Professional traffic control shall be utilized when and where appropriate.

3.4.5 Public Utilities

Impacts

Road construction would entail potential relocation and/or temporary removal of electricity/telephone poles and transmission lines and water and gas mains and distribution lines near the project termini and at Kukuau Street.

Mitigation

Disruption during construction should be scheduled so as to minimize the length of time utility customers are inconvenienced.

3.5 Required Permits and Approvals

Several permits and approvals would be required to implement this project. They are listed here under their granting agencies.

Permits, Clearances or Approvals Granted:

United States Department of the Army
- a. Section 404 Wetlands Permit

Hawaii Coastal Zone Management Program
- a. Coastal Zone Management Program Consistency Review

State Historic Preservation Officer
- a. Finding of No Adverse Effects to Significant Historic Sites

Permits Sought Prior to Construction:

State Department of Health:
- a. National Pollutant Discharge Elimination System Permit
- b. Section 401 Water Quality Certification

County Department of Public Works:
- a. Permits for Excavation of Public Highway, Grading, Grubbing, and Stockpiling
- b. Permits for Outdoor Lighting
- c. Permits for Electrical Work

County Planning Department
- a. Permit for Subdivision

4 COMMENTS AND COORDINATION

4.1 Agencies Contacted

The following agencies received a letter inviting their participation in the preparation of the Environmental Assessment.

County of Hawaii

o Planning Department
o Department of Water Supply
o Fire Department
o Police Department
o County Council

State of Hawaii

o Department of Land and Natural Resources, State Historic Preservation Officer
o Hawaii State Department of Transportation, Hawaii District Highways Division
o Hawaii Department of Business, Economic Development and Tourism,
Hawaii Coastal Zone Management Program

Federal Agencies

o U.S. Fish and Wildlife Service, Division of Ecological Services
o U.S. Army Engineer District, Honolulu, Operations Division
o U.S. Geological Survey

Copies of correspondence from agencies with substantive comments during the preparation of the EA are included in Appendix 5 (Section 4.3 for federal agencies or state agencies with jurisdiction over federal programs or laws) and are cited in appropriate sections of the text of this EA.

Notice of the availability of the Draft EA was published in both the local newspaper (see Appendix 5) and the *OEQC Environmental Notice* of September 23, 1997. A 30-day comment period began on September 23 and ended on October 22, 1997. A total of seven comment letters were received from agencies and the public. These letters and the responses of the Hawaii County Department of Public Works to them are included in Appendix 5.

4.2 Public Involvement

The following organizations received a letter inviting their participation in the preparation of the Environmental Assessment:

- o Higashi Hongwanji Mission
- o Ainako Community Association
- o Hawaii Island Chamber of Commerce
- o Sierra Club
- o Kaumana 1-1/2 Mile Kumiai
- o University of Hawaii at Hilo

The County of Hawaii invited public participation in the Mohouli Extension project through several meetings with neighborhood residents potentially impacted by the project. A meeting with corridor residents and landowners was held on May 28, 1996, and a meeting with Mohouli Street residents was held on May 29, 1996. Invitations to the first meeting were by mail, and to the second by door-to-door flyers. The purposes of the meetings included gauging support for the general idea of the project, assessing priority needs of the community, and identifying environmental issues. The process has generated evidence of the perceived effects of the project on neighborhood issues, such as identity, cohesion, and safety. Appendix 5 contains the notice and sign-in sheets for the meeting.

The principal concerns and questions expressed at the meetings concerned speed limits and safety on the new road, local drainage, sight-distance restrictions on properties near the intersection of Kukuau Street and Mohouli Street, and issues related to the widening of the existing segment of Ainako Avenue.

A public hearing advertised in the local newspaper was held on October 8, 1997, at the University of Hawaii at Hilo. Approximately 30 members of the public attended. The agenda, transcripts and summary of the meeting are included in Appendix 5.

4.3 Coordination Correspondence

This section contains coordination letters from federal agencies (or state agencies mandated with administering federal laws or programs) with jurisdiction over aspects of the project and/or expertise in areas of concern. Attached are letters from the following agencies:

U.S. Army Corps of Engineers
U.S. Department of the Interior, Geological Survey (USGS)
U.S. Fish and Wildlife Service
Hawaii State Historic Preservation Division
Hawaii Coastal Zone Management Program

Hawaiian Volcano Observatory
U.S. Geological Survey
Box 51
Hawaii National Park, HI 96718
(808) 967-8807
FAX (808) 967-8890

Bruce K. Meyers, P.E.
Okahara & Associates, Inc.
200 Kohala St.
Hilo, HI 96720

February 23, 1996

Re: Environmental Assessment for Mohouli Street Extension

Dear Mr. Meyers,

David Clague has asked me to respond to your request for information on the site of the Mohouli Street extension. Since our main area of expertise is volcanology, I will confine my comments to the volcanic hazards in the study area.

The proposed street is located on the flank of Mauna Loa and is underlain by lava flows from the northeast rift zone of Mauna Loa. The extension would cross the youngest of these, the 1881 flow, as well as one or two older flows (refer to the "Geologic Map of the Hilo 7 1/2' Quadrangle, Island of Hawaii", copy enclosed). This area is in lava flow hazard zone 3, as defined in the booklet "Volcanic and Seismic Hazards on the Island of Hawaii" (copy enclosed). The 1881 flow was the product of an eruption on the northeast rift zone that lasted for 10 months. Lava flows from eruptions of shorter duration in 1852, 1855, 1942, and 1984 stopped short of the city limits, upslope of the proposed street. Prior to 1881, lava flows had not encroached on the greater Hilo area for roughly 500 years.

Please do not hesitate to call me if you need further information.

Sincerely,

Christina Heliker

Christina Heliker
Geologist
Hawaiian Volcano Observatory

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FEB 27 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

76003

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

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MAR 28 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

In Reply Refer To: TR

MAR 26 1996
COPY
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IN ....

Mr. Bruce K. Meyers, P.E.
Okahara & Associates, Inc.
200 Kohola St.
Hilo, HI 96720

Re: Notice of Intent to Prepare an Environmental Assessment for Mohouli Street Extension.

Dear Mr. Meyers:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Intent (NOI) to prepare an Environmental Assessment (EA) for Mohouli Street Extension. The purpose of the project is to provide a direct link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas. The project sponsors are the Federal Highway Administration and the County of Hawaii Department of Public Works. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The proposed project would traverse a lowland ohia forest that may support native species of plants, birds and invertebrates. The proposed project route may also pass over subterranean lava tube systems. The Service recommends that the draft EA address project-related impacts to fish and wildlife resources and habitats along the project route, particularly impacts on endangered and threatened species and migratory fish and birds.

The federally listed Hawaiian hawk (*Buteo solitarius*), dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*), Newell's shearwater (*Puffinus auricularis*), and the Hawaiian hoary bat (*Lasiurus cinereus semotus)* may occur within the vicinity of the project site or traverse the area. It is unlikely that the Hawaiian hoary bat will be impacted by the proposed project. However, the Hawaiian hawk may nest or roost in the area and may be impacted by forest clearing. The Service is also concerned that the proposed street lighting system may attract listed seabirds. Seabirds, especially young birds leaving interior mountain nest sites for the first time, are attracted to bright lights They may become blinded and disoriented and fly into unseen objects such as utility wires, buildings, and other urban structures This phenomena is known as seabird "fallout" and occurs most frequently between October and November each year. The Service recommends that the draft EA address the impact of forest clearing on the Hawaiian hawk, as well as the impact of the street lighting on seabirds.

The Service also recommends that the draft EA consider alternate alignments or other measures that would avoid or minimize impacts to any cave systems and any aquatic resources that may be associated with Alenaio Stream. We suggest that Alenaio stream be surveyed for the presence of permanent pools. If the stream has permanent pools, the proposed project area may contain Pacific megalagrion damselfly (*Megalagrion pacificum*) and orangeback megalagrion damselfly (*Megalagrion xanthomelas*) (both candidates for listing), as well as native amphidromous fish and crustaceans.

Finally, the Service has also reviewed maps prepared by the Hawaii Heritage Program of the Nature Conservancy. These maps show historical records of endangered, threatened or proposed endangered species in the vicinity of the proposed corridor including one species of bird, *Psittirostra psittacea* (possibly extinct), and four species of plants: *Adenophorus periens*, *Asplenium fragile* var. *insulare*, *Cyanea platyphylla*, and *Stenogyne angustifolia*. Records of species of concern in the vicinity of the project area include historic records of nine species of plants: *Botrychium subbifoliatum* (possibly extinct), *Cyanea tritomantha*, *Joinvillea ascendens* ssp. *ascendens*, *Lindsaea repens* var. *macraeana*, *Phyllostegia brevidens*, *Phyllostegia floribunda*, *Phyllostegia vestita*, *Thelypteris boydiae*, *Torulinium odoratum* ssp. *auriculatum* and a current record of one species of insect, *Pentarthrum obscurum*. While species of concern are not currently federally protected, they may be added to the Endangered Species List in the future. It is unlikely that any of the above species are present in the proposed project area, with the exception of *Pentarthrum obscurum*. However, the Service recommends that the proposed road realignment be surveyed to confirm that no rare flora or fauna will be impacted by the project.

The Service appreciates the opportunity to provide comments on the NOI, and we look forward to receiving a copy of the draft EA for review. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Tanya Rubenstein at 808/541-3441.

Sincerely,

Acting Karen Harper

Brooks Harper
Field Supervisor
Ecological Services

cc: USGS, Honolulu
EPA-Region IX, San Francisco
DOT, Honolulu
DPW, Hilo, Hawaii County

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

June 25, 1996

Dr. Robert Spear
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 777
Honolulu, Hawaii 96813

LOG NO: 17438
DOC NO: 9606PM33

Dear Dr. Spear:

SUBJECT: Draft Report: "*An Archaeological Inventory Survey of the Proposed Mohouli Connector Road Ahupua`a of Kukuau 1 and 2, Ponahawai, and Punahoa, South Hilo District, Island of Hawai`i*" (Robins, Fortini and Spear 1996)
TMK: 2-3-44:9; 2-4-1:122; 2-4-73: 35; 2-5-06:1

Thank you for submitting the subject report, received in our office on April 9, 1996, for our review and comments, and our apologies for the delay in completing our review.

We believe that the archaeological survey of the proposed connector road was adequate and that there are indeed no historic sites in the project area. We agree that no further archaeological work is required in the project area.

Based on available data, the proposed connector road will have "no effect" on significant historic sites. In the event that human burials or other kinds of historic sites are found during road construction all work should stop immediately and our office notified.

With regard to the report itself, we noted a couple of minor problems that need to be corrected before it can be accepted. First, we can find no discussion of the Spear 1992 and Spear 1993 projects shown on Figure 1. Second, the Methodology section should make it clear that the survey covered the whole project area, that it was not a reconnaissance survey as presently stated. Third, the References section at the end of the report is incomplete; the Spear 1992 and 1993 references, for example, are both missing.

If you have any questions please contact Patrick McCoy (587-0006).

Sincerely,

Ross Cordy

for DON HIBBARD, Administrator
State Historic Preservation Division

PM:jk

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

July 5, 1996

Dr. Robert Spear
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 777
Honolulu, Hawaii 96813

LOG NO: 17505
DOC NO: 9607PM01

Dear Dr. Spear:

SUBJECT: **Final Report: "*An Archaeological Inventory Survey of the Proposed Mohouli Connector Road Ahupua`a of Kukuau 1 and 2, Ponahawai, and Punahoa, South Hilo District, Island of Hawai`i*" (Robins, Fortini and Spear 1996)**
TMK: 2-3-44:9; 2-4-1:122; 2-4-73: 35; 2-5-06:1

Thank you for submitting the revised report, received in our office on July 1, 1996, for our review and approval.

The revised report has satisfactorily addressed the comments in our review letter of June 25, 1996, and now meets with our approval. As indicated in our last letter, we believe that the archaeological survey of the proposed connector road was adequate and that there are indeed no historic sites in the project area. We agree that no further archaeological work is required in the project area. Based on available data, the proposed connector road will have "no effect" on significant historic sites.

In the event that human burials or other kinds of historic sites are found during road construction all work should stop immediately and our office notified.

Sincerely,

Ross Cordy
for DON HIBBARD, Administrator
State Historic Preservation Division

PM:jk

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

September 9, 1996

Operations Branch

Ms. Donna F. Kiyosaki
Chief Engineer
Department of Public Works
25 Aupuni Street
Hilo, HI 96720

Dear Ms. Kiyosaki

This is in response to your application for a Department of the Army (DA) permit for construction of a 6,500-foot long, 60-foot wide roadway between Komohana Street and Kaumana Drive, Hilo, County and State of Hawaii. The road will result in the discharge of dredged or fill material into approximately 3,000 square feet of wetlands.

Based on the information you provided, we have determined that the proposed work can be authorized by the Corps Nationwide permit (NWP) authority at 33 CFR 330 Appendix A, Paragraph B.26 (NWP #26, Headwater and Isolated Water Discharges) and no further Department of the Army processing is necessary. However, the DA permit will be valid only after you obtain a Section 401 Water Quality Certification, or waiver thereof, from the State Department of Health and a Coastal Zone Management Federal Consistency Determination, or waiver, from the Office of State Planning. Until these approvals, or waivers, are received, we are issuing you a "Provisional Nationwide Permit" for the proposed work.

If the state issues the certifications or waivers, this authorization will take effect from the latter issuance date and will remain valid until the nationwide permit is modified, reissued, or revoked. All of the nationwide permits are scheduled to be modified, reissued or revoked prior to January 21, 1997. At that time, you are responsible for consulting with this office to confirm that your project still complies with the specifications and conditions of NWP #26, including changes or revisions. Please note that if you commence, or are under contract to commence the proposed activity before the date that NWP #26 is modified or revoked, you will have 12 months from the date of the modification or revocation to complete the activity under the existing terms and conditions. If the state denies either approval for the proposed project, then this NWP will be denied without prejudice.

Attached are excerpts from the regulations which include the conditions of the NWP for your information and compliance. In addition, we are adding the following special conditions:

1. You must provide adequate drainage, through the use of culverts or other systems, in the wetland areas.

2. Significant earth-moving activities must occur only during periods of no or low rainfall. You must make every effort to conduct construction activities during the "dry season" (May through September).

3. You shall conduct construction activities in a manner as to minimize and control erosion and sedimentation. You must install silt containment devices, as appropriate, and revegetate any exposed or excavated banks as soon as practicable.

4. Fill and other construction materials must be clean, uncontaminated and be free of deleterious substances, including toxic chemicals, debris, and fine grained material.

5. You must take particular care to ensure that no petroleum products, trash or other debris enter the water.

6. No construction or excavated materials shall be stockpiled in the aquatic environment.

7. You must submit a written final compliance report to this office within two months of completion of the authorized project. The final report must include, as appropriate, description of the construction activities, discussion(s) of any deviations from the proposed project design and the cause of these deviations, results of environmental monitoring, discussion(s) of any necessary corrective action, and photographs documenting the progress of the permitted work.

File Number 960100143 has been assigned to this project. Please refer to this number in any correspondence with us. Feel free to contact Ms. Kathleen A. Dadey of my staff at (808) 438-9258, extension 15 f you have any questions.

Sincerely,

Rosemary C. Hargrave

Rosemary C. Hargrave
Acting Chief, Operations Branch

Enclosures

Copy Furnished (w/o encl.):
U.S. Fish and Wildlife Service, Honolulu, HI
DBEDT, CZM Program Office, Honolulu, HI
Department of Health, Clean Water Branch, Honolulu, HI
State Department of Land and Natural Resources, Honolulu, HI
County of Hawaii Department of Public Works, Hilo, HI
Department of Planning, County of Hawaii, Hilo, HI
Y.K. Hahn and Associates, Hilo, HI
Dr. Grant Gerrish, University of Hawaii at Hilo, Hilo, HI

Ref. No. P-6311

October 3, 1996

Ms. Donna Fay K. Kiyosaki, P.E.
Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street, Room 202
Hilo, Hawaii 96720-7138

Dear Ms. Kiyosaki:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency for the Mohouli Street Extension, Hilo, Hawaii; Department of the Army Permit File No. 960100143

Your proposal to construct a 6,500-foot long road between Komohana Street and Kaumana Drive in Hilo, involving filling of 3,000 square feet of wetlands, has been reviewed for consistency with Hawaii's CZM Program. We concur with your CZM assessment and finding that the activity is consistent based on the following conditions.

1. To minimize erosion, sedimentation and non-point source pollution during construction, we concur with and adopt the seven special conditions of the Army Corps of Engineers Nationwide Permit.

2. In construction activities, you shall comply with State water quality standards and requirements. This can be accomplished by complying with the terms of the Section 401 Water Quality Certification and National Pollutant Discharge Elimination System permit from the Department of Health.

3. Street lighting installed along the extension will be shielded in accordance with the Hawaii County Outdoor Lighting Ordinance as proposed in the CZM Assessment Environmental Support Document (p. 11). This measure should reduce potential impacts due to disorientation of two species of endangered birds, the dark-rumped petrel and the Newell's shearwater, which traverse the project area.

CZM consistency approval is not an endorsement of the project nor does it convey approval with any other regulations administered by any State or County agency. Thank

Ms. Donna Fay K. Kiyosaki
Page 2
October 3, 1996

you for your cooperation in complying with Hawaii's CZM Program. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Rick Egged
Director
Office of Planning

cc: U.S. Army Corps of Engineers, Operations Branch
U.S. National Marine Fisheries Service, Pacific Area Office
U.S. Fish and Wildlife Service, Pacific Islands Ecoregion
Department of Health, Clean Water Branch
Department of Land & Natural Resources
Planning & Technical Services Branch
Planning Department, County of Hawaii

96003:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply Refer To: JMB

FEB 12 1997

Ms. Donna F. Kiyosaki
Chief Engineer
Department of Public Works
25 Aupuni Street
Hilo, HI 96720

Re: Wetland Fill Associated with the Mohouli Street Extension, Army file #960100143

Dear Ms. Kiyosaki:

In a letter dated November 29, 1996, Dr. Grant Gerrish requested, on your behalf, information from the Fish and Wildlife Service (Service) regarding the the need for wetland mitigation for the Mohouli Street Extension project, Hilo, Hawaii. This project would include filling a small (2000-3000 square feet) area of wetland dominated by introduced grasses. In a letter to you dated December 11, 1996, the Corps of Engineers (Corps) stated that the existing functions of this wetland are primarily hydrological and would be replaced by the planned roadway.

The Service has examined the site and agrees with the assessment of the Corps of Engineers (Corps) that no mitigation or mitigation plan is necessary for this wetland fill.

The Service appreciates your concern for wetland ecosystems and water quality, and we apologize for the delay in this reply. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Jeff Burgett at (808) 541-3441.

Sincerely,

Donald Palawski
for Brooks Harper
Field Supervisor
Ecological Services

cc: DOH, Honolulu
Grant Gerrish

RECEIVED
FEB 18 1997
OKAHARA & ASSOC., INC.
HILO OFFICE

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 · Hilo, Hawaii 96720-4252
(808) 961-8321 · Fax (808) 961-8630

February 23, 1998

CHIEF OF OPERATIONS
DEPARTMENT OF THE ARMY
US ARMY ENGINEER DIVISION
OPERATIONS BRANCH
FT SHAFTER HAWAII 96858-5440

SUBJECT: **Additional Information Concerning Department of the Army Permit for Mohouli Street Extension Project, Hilo, Hawaii: File No. 960100143**

The County of Hawaii received a letter from your office dated September 9, 1996, authorizing the Mohouli Street Extension Project under Nationwide Permit #26. We expect to issue the Final EA and FONSI for this project in March of 1998.

In January of 1998, the engineering consultant for the project determined during final design that drainage structures associated with the project would necessitate disturbance of an additional area of approximately 3 acres surrounding the study corridor (see attached figure for new area). An additional biological and wetland study and analysis of this area has been completed. The report will be included in the Final EA as an addendum to the original Flora and Fauna report, dated April 25, 1996. A copy of this addendum is attached for your use and comment.

Our points of contact for further discussion of this matter are Ben Ishii of my staff (961-8327) and Bruce Meyers of Okahara & Associates (phone 961-5527; address 200 Kohola St., Hilo, HI 96720). For discussion of the technical contents of the attached addendum, you may contact our wetlands consultant, Grant Gerrish (phone: 974-7363; address: P.O. Box 282, Laupahoehoe, HI 96764).

DONNA FAY K. KIYOSAKI, PE
Chief Engineer

Attachments: 1 map
Flora and Fauna Addendum

cc: Bruce Meyers, Okahara & Associates via fax 961-5529 (no attachments)
Ron Terry, Y.K. Hahn & Associates via fax 982-5831 (no attachments)
Grant Gerrish via fax 974-7362 (no attachments)

E:\WP Files\Projects\Mohouli Extension\LETTERS.WPD(6)

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 · Hilo, Hawaii 96720-4252
(808) 961-8321 · Fax (808) 961-8630

February 23, 1998

DON HIBBARD ADMINISTRATOR
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET 6TH FLOOR
HONOLULU HAWAII 96813

ATTN: Pat McCoy

Subject: **ENVIRONMENTAL ASSESSMENT**
Mohouli Extension Komohana Street to Kaumana Drive
Project No. STP-2790(1)

This letter follows up on discussions between Pat McCoy of your office and Ron Terry, a representative of Okahara & Associates, our consulting engineers for the project. Dr. Terry had requested your office on behalf of the Hawaii County Department of Public Works to evaluate the potential for effects to significant historic sites for an area adjacent to the proposed road corridor which had been added to the project's footprint of disturbance (see attached figure of project area).

As background, an archaeological inventory survey of the proposed extension was conducted in April 1996 by Scientific Consultant Services, Inc. (SCS). The inventory focussed on a study corridor 200 feet in width surrounding the proposed centerline. In your letter of 5 July 1996 to Dr. Robert Spear of SCS, you concurred with the finding that no historic sites were present, that the project would have "no effect" on significant historic sites, and that no further archaeological work was required for the area.

In January of 1998, the engineering consultant for the project determined that drainage structures associated with the project would necessitate disturbance of an additional area of approximately 3 acres surrounding the study corridor.

Dr. Terry's fieldwork and literature search on the additional area determined that in all likelihood, there are no historic sites in the area Three team members walked the site for about 3 hours on 22 January 1998 and found no evidence of archaeological features or artifacts. The entire area was formerly cultivated in sugar cane and thereby repeatedly and extensively disturbed and modified. A survey by PHRI Inc., entitled *Archaeological Inventory Survey, Komohana Golf Course, Lands of Ponahawai and Punahoa 1-2, South Hilo District, Island of Hawaii (TMK 3-2-3-44:09)* concluded that only two historic sites were present on the entire parcel of which the three acres is part. These sites were located near Komohana Street (see attached figure reproduced from that report for location) and would in no way be impacted by the proposed roadway or associated drainage structures.

In response to a fax sent by Dr. Terry on 29 January 1998, your office was kind enough to reply promptly via telephone message that it appeared that a determination of no effect would be appropriate. You requested, however, that we supply you with a more detailed map indicating the location of the additional area and a Tax Map Key and ahupua`a listing. A figure prepared by Okahara & Associates meeting your request is attached.

If this information is sufficient, we would now like to request a formal determination by your office as to historic sites. We expect to issue a FONSI for the project under NEPA and Chapter 343, HRS, as early as March 1998. It would be ideal, if possible, to have the determination formally made by this time. If you have any questions or require additional information, please call Ben Ishii of my staff at 961-8327, or Dr. Terry at 982-5831. We thank you for your timely assistance in this matter.

DONNA FAY K. KIYOSAKI, PE
Chief Engineer

Attachments: 2 maps

cc: Bruce Meyers, Okahara & Associates
via fax 961-5529 (no attachments)

Ron Terry, Y.K. Hahn & Associates
via fax 982-5831 (no attachments)

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
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HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

March 4, 1998

LOG NO: 20993 ✓
DOC NO: 9802PM01

Ms. Donna Fay K. Kiyosaki, Chief Engineer
County of Hawaii Department of Public Works
25 Aupuni Street, Room 202
Hilo, Hawaii 96720

Dear Ms. Kiyosaki:

SUBJECT: Mohouli Street Extension--Need for Additional Area
Ponahawai, South Hilo, Hawaii Island
TMK: 2-5-06:01

This is in response to your letter of February 23, 1998 to staff archaeologist, Patrick McCoy, requesting a determination of effect for the use of an approximately 3 acre piece of property that was not included in the original Mohouli Street Extension archaeological study area.

Your letter indicates that the three acre area was covered in an earlier archaeological inventory survey of the Komohana Golf Course undertaken by PHRI in which only two sites were found in the whole project area. No sites were found in the three acre parcel, which was recently walked again by Dr. Ron Terry and two other individuals. Since the three acre area, which is old sugarcane cropland, has already been surveyed and no sites were found we can conclude that the proposed use of this piece of land will have "no effect" on significant historic sites.

If you have any questions please contact Patrick McCoy (587-0006).

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

PM:amk

RECEIVED
MAR 25 1998
OKAHARA & ASSOC., INC.
HILO OFFICE

5 LIST OF DOCUMENT PREPARERS

This Environmental Impact Statement was prepared for the Federal Highway Administration and the County of Hawaii by Okahara and Associates jointly with Y. K. Hahn and Associates. The following companies and individuals were involved:

Co-Consultant

Okahara and Associates
200 Kohola Street
Hilo, Hawaii 96720

Masa Nishida, P.E.
Co-Project Manager

Bruce Meyers, P.E.
Project Engineer

Co-Consultant

Y.K. Hahn and Associates
1180 Kumuwaina Place
Hilo, Hawaii 96720

Youngki Hahn
Ph.D. Economics
Co-Project Manager

Sub-Consultants

Ron Terry
Ph.D. Geography,
Principal Investigator

Y. Ebisu, P.E.
Acoustic Engineering

Grant Gerrish
Ph.D. Botany
Botanical & Ecological

Sherry Miller
B.S., Biology
Water Quality

Scientific Consulting Services, Inc.
Robert L. Spear, Ph.D.
Archaeology

Barry Neal, M.S.
Air Quality

Julian Ng, P.E.
Traffic Engineer

6 STATE OF HAWAII ENVIRONMENTAL ASSESSMENT FINDINGS

Section 11-200-12 of the State Administrative Rules sets forth the criteria by which the significance of environmental impacts shall be evaluated. The following discussion paraphrases these criteria individually and evaluates the project's relation to each.

1. *The project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* A small area of semi-natural vegetation will be committed to use as a roadway. The State Historic Preservation Division has determined that no cultural resources are present. An estimated area is less than 300 sq. meters of wetlands will be taken. A Nationwide Permit for Dredge and Fill has been issued by the U.S. Department of the Army, which determined that no significant impact to wetlands would occur, with adherence to conditions.

2. *The project will not curtail the range of beneficial uses of the environment.* No future beneficial use of the environment will be affected in any way by the proposed project.

3. *The project will not conflict with the State's long-term environmental policies.* The State's long term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. A number of specific guidelines support these goals. No aspect of the proposed project conflicts with these guidelines. The project supports a number of guidelines, including those calling for maintenance of an integrated system of state land use planning which coordinates state and county plans, and encouraging transportation systems in harmony with the lifestyle of the people and the environment.

4. *The project will not substantially affect the economic or social welfare of the community or State.* The improvements will benefit the social and economic welfare of South Hilo. It will improve the transportation system in terms of safety, efficiency, and energy consumption by providing a shorter, wider and straighter route for motorists between their homes and destinations within Hilo.

5. *The project does not substantially affect public health in any detrimental way.* No effects to public health are anticipated.

6. *The project will not involve substantial secondary impacts, such as population changes or effects on public facilities.* No adverse secondary effects are expected. The project will not enable development.

7. *The project will not involve a substantial degradation of environmental quality.* Permits mandating best management practices for wetlands, floodplains and construction areas will ensure that the project will not degrade environmental quality in any substantial way.

8. *The project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* No endangered species of flora or fauna are known to exist on the project site or would be affected in any way by the project.

9. *The project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* Cumulative impacts result when implementation of several projects that individually have minor impacts combine to produce more severe impacts or conflicts among mitigation measures. Other current, recent or planned road or major construction projects nearby are limited to the planned Puainako Street Extension (Fig 1-1). All adverse impacts of the Mohouli Extension related to native species/habitat, wetlands, water quality, erosion, historic sites, and other areas of concern are either non-existent or restricted in geographic scale, negligible, and capable of mitigation through proper enforcement of permit conditions. Therefore, such impacts would not tend to accumulate in relation to this or other projects.

10. *The project will not detrimentally affect air or water quality or ambient noise levels.* The project will have negligible effects in terms of water quality. There will be an overall benefit in regard to air quality and noise because of the more efficient conduction of traffic and the routing of unnecessary traffic away from heavily populated neighborhoods.

11. *The project will not affect environmentally sensitive areas, such as flood plains, tsunami zones, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.* The project will cross an identified floodway, but the crossing structures will avoid adverse impact to drainage. Although the project is located in a zone exposed to some earthquake and volcanic hazard, there are no reasonable alternatives.

12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No protected viewplanes are present in the area.

13. *The project will not require substantial energy consumption.* Although input of energy is required for road construction, a net benefit is expected because of reductions in travel time and increases in fuel efficiency resulting from improved Level of Service.

For the reasons above, the Hawaii County Department of Public Works has determined that the proposed project will not have any significant effect in the context of Chapter 343, Hawaii Revised Statues and section 11-200-12 of the State Administrative Rules, and has issued a Finding of No Significant Impact.

REFERENCES

Belt, Collins and Associates. 1975. *Hilo Community Development Plan*. Hilo: Hawaii County Planning Dept.

Dudley, W. 1991. *Final Report: Distribution and Dispersion of Sewage Pollution in Hilo Bay and Contiguous Waters*. Hilo: University of Hawaii at Hilo.

Federal Register. 1990a. "Endangered & threatened wildlife and plants." 50 CFR 17.11 & 17.12. April 15, 1990.

Federal Register. 1990b. "Endangered and threatened wildlife and plants; review of plant taxa proposed for listing as endangered or threatened species; Notice of review." 50 CFR Part 17. Feb. 21, 1990.

Gagne, W. and L. Cuddihy. 1990. "Vegetation," pp. 45-114 in Wagner, W.L. et al., eds. *Manual of the Flowering Plants of Hawaii*. 2 vols. Honolulu: University of Hawaii Press.

Hawaii State Commission on Water Resources Management (CWRM). 1990. *Draft Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources*. Prep. for CWRM by Hawaii Cooperative Park Service Unit. Honolulu; National Park Service.

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Appendix 1

TRAFFIC ASSESSMENT
FOR
MOHOULI STREET EXTENSION

TRAFFIC ASSESSMENT
MOHOULI STREET EXTENSION

August 1996

prepared by:

Julian Ng, Incorporated
P. O. Box 816
Kaneohe, Hawaii 96744

TABLE OF CONTENTS

Mohouli Street Extension
Traffic Assessment
Komohana Street to Kaumana Drive
Hilo, Hawaii
August 1996

The County of Hawaii has proposed to construct the Mohouli Street Extension from the current west terminus of Mohouli Street at Komohana Street to Kaumana Drive, ending opposite Ainako Avenue. The existing T-intersection of Mohouli Street and Komohana Street will become a cross-intersection. The project will terminate at the existing cross-intersection of Ainako Avenue and Kaumana Drive with a narrow one-block segment of Ainako Avenue being widened as part of the Mohouli Street extension project. Between the project termini, the Mohouli Street Extension will also intersect the existing Kukuau Street, a collector street serving the Sunrise Estates subdivision. Exhibit 1 shows the location of the project.

The Mohouli Street extension project is one of several roadway projects in the Hilo area intended to improve linkages and provide alternative access to the various neighborhoods in the city. The extension and realignment of a portion of Puainako Street south of Mohouli Street has also been proposed. A future extension of Kupulau Street has also been identified.

This report summarizes the findings of an assessment of future conditions without and with the proposed Mohouli Street extension. This assessment was also done to provide traffic volumes for use in noise and air quality evaluations. The completion and use of the Puainako Street extension to Kaumana Drive was assumed in this assessment. Future conditions for year 2020 without and with the proposed extension of Mohouli Street were considered; projections of daily traffic volumes on roadway links obtained from the computer model developed for long-range planning are shown in Exhibit 2.

The daily capacity of a two-lane roadway is between 10,000 and 20,000 vehicles per day, depending on roadway geometry and traffic charateristics. For the major streets in the Hilo suburban area, daily volumes greater than 15,000 indicate the need for additional lanes. As shown in Exhibit 2, Komohana Street in the vicinity of Mohouli Street would require widening, with or without the extension of Mohouli Street. Therefore, this assessment has also assumed that Komohana Street at Mohouli Street will be a four-lane roadway.

This assessment included estimates of peak hour turning movements at the termini of the project and at the intersection of Waianuenue Avenue and Komohana Street, without and with the extension of Mohouli Street. Turning movements at the intersection of Mohouli and Kukuau Streets with the project were also estimated. At each location, peak hour intersection conditions were identified and compared.

The ability of a signalized intersection to serve traffic demands is related to the number of lanes provided for each movement and the phasing of the signal operation. For this assessment of estimated future volumes, a procedure based on the "Planning Analysis" from the 1985 *Highway Capacity Manual*[1] was used to identify intersection conditions as "under" capacity, "near" capacity, or "over" capacity. In this analysis, critical volumes are computed (on a per lane basis) for movements which conflict with other movements; these critical volumes are summed to provide an indication of the overall intersection condition. The desirable under capacity condition will occur if the sum of the critical volumes is 1,200 or less; sums greater than 1,400 indicate over capacity conditions and changes should be made to the intersection. For sums between 1,201 and 1,400, the near capacity conditions are unstable and traffic congestion could occur.

At unsignalized intersections, the volumes of the uncontrolled movements affect the capacity available for the other movements which must yield or stop. The analyses of unsignalized intersections used the procedure from the 1994 update of the *Highway Capacity Manual*[2] to identify average delays and levels of service for each controlled movement. These Levels of Service (LOS) are defined using the letters A through F:

LOS	Average delay (seconds)
A	≤5.0 seconds
B	>5 and ≤10 seconds
C	>10 and ≤20 seconds
D	>20 and ≤30 seconds
E	>30 and ≤45 seconds
F	>45 seconds

Intersection of Waianuenue Avenue and Komohana Street - The proposed Mohouli Street extension will provide an alternative access to the Kaumana area of Hilo. As indicated in Exhibit 2, it is expected to divert some of the traffic from Waianuenue Avenue and Punahele Street near Komohana Street. Two existing conditions affect traffic in the area: Waianuenue Street is operated one-way eastbound during portions of the morning peak period, with Punahele Street providing an alternative route for westbound traffic between downtown Hilo and Komohana Street. These conditions were assumed to be temporary in nature and the estimates of peak hour traffic in the area were all assigned to the intersection of Waianuenue Avenue and Komohana Street as shown in Exhibit 3.

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1 Transportation Research Board, National Research Council, *Highway Capacity Manual*, Special Report 209. Washington, D.C. 1985

2 Transportation Research Board, National Research Council, *Highway Capacity Manual - Third Edition*, Special Report 209. Washington, D.C. 1994

The existing striping and signal phasing at the intersection were used in the analysis, which shows that additional lanes or other improvements will be needed (over capacity in the AM Peak Hour) if Mohouli Street is not extended to Kaumana Drive. With Mohouli Street extended to Kaumana Drive, the peak hour traffic demands could be served by the existing intersection at desirable under capacity conditions. Table 1 summarizes the analysis.

Table 1
Waianuenue Avenue and Komohana Street
Intersection Capacity Analysis

	Without Project		With Project	
Peak Hour:	AM	PM	AM	PM
Northbound Left Turn (Komohana St.)	323	542	66	139
Westbound Left Turn (Waianuenue Ave.) *	315	548	340	501
Eastbound Through Movement	921	279	556	149
Total Critical Volume	1,559	1,369	962	789
Condition	over capacity	near capacity	under capacity	under capacity

* shared lane used as a separate lane due to high turn volumes

Mitigation of the over capacity conditions that would occur in the AM Peak Hour without the proposed Mohouli Street extension project could include the continued use of Punahele Street for westbound traffic. In the PM Peak Hour, even two-thirds of the eastbound traffic at the intersection were removed (diverted to Punahele Street), near capacity conditions would occur; the widening of Komohana Street to provide a second northbound left turn lane to Waianuenue Avenue could improve PM conditions to under capacity.

Intersection of Ainako Avenue and Kaumana Drive - Although this intersection is currently unsignalized, the County of Hawaii will be installing traffic signals at the intersection of Ainako Avenue and Kaumana Drive before the middle of 1997. The proposed Mohouli Street extension would result in increased traffic volume on the north, west, and south legs of this intersection. Traffic on the east leg (Kaumana Drive toward downtown Hilo) would decrease. Traffic on the north leg (to and from upper Kaumana) would increase as a result of the alternative routing provided by the Mohouli Street connection. Estimates of the peak hour turning movements are shown in Exhibit 4.

Without the Mohouli Street extension, a signalized intersection operating in four phases and striped as shown in the upper half of Exhibit 4 will operate at under capacity conditions in both peak hours. The extension of Mohouli Street will significantly increase turning volumes between the west (Kaumana Drive) and south (Mohouli Street) legs of the intersection. The separation of the left turn and through movements on the Ainako Avenue approach would allow the signal phasing to be changed to provide protected left turns from

Ainako Avenue and from Mohouli Street, allowing the intersection to continue operating at desirable under capacity conditions in the peak hours. Table 2 summarizes the analysis.

Table 2
Kaumana Drive and Ainako Avenue/Mohouli Street
Intersection Capacity Analysis

	AM Peak Hour	PM Peak Hour
Without Project (split phasing assumed):		
Northbound Ainako Avenue	33	20
Southbound Ainako Avenue	421	210
Eastbound Kaumana Drive	447	219
Westbound Kaumana Drive	255	721
Total Critical Volume	1,156	1,170
Condition	under capacity	under capacity
With Project (critical movements):		
Mohouli St./Ainako Ave.		
Protected Left Turns from Mohouli Street	272	403
Opposing Through and Right Turns	375	423
Kaumana Drive		
eastbound shared lane *	329	327
Total Critical Volume, sum of higher subtotals	976	1,153
Condition	under capacity	under capacity

* left turns (x 1.1 where opposing traffic < 200 vph or x 2.0) plus through movement

Intersection of Mohouli Street and Kukuau Street - The proposed Mohouli Street extension will intersect the existing Kukuau Street, which is a collector street providing access to the Sunrise Estates subdivision. The intersection has been assumed to be unsignalized, with stop signs controlling the Kukuau Street approaches. Estimated peak hour volumes are shown in Exhibit 5; the unsignalized intersection would have adequate capacities. The total peak hour traffic on the westbound approach of Mohouli Street exceeds 600 vph, with left turns comprising approximately five percent of this volume. The opposing traffic (eastbound Mohouli Street) also exceeds 600 vph. These conditions indicate that a separate left turn lane should be provided[3] on Mohouli Street for the westbound traffic.

3 American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*. Washington, D.C. 1990. pp. 790-791

Intersection of Mohouli Street and Komohana Street - The proposed Mohouli Street extension will change the existing T-intersection of Mohouli and Komohana Streets to a cross-intersection. Estimated peak hour volumes at this intersection are shown in Exhibit 6. The County of Hawaii will be installing traffic signals at this intersection independent of the extension of Mohouli Street. Due to the high volumes projected on Komohana Street for the future year, it has been analyzed in this assessment as a four-lane roadway with separate turn lanes. In the case without the extension of Mohouli Street, the intersection would operate at near capacity conditions in the AM Peak Hour. A second southbound left turn lane, which would require additional widening on Komohana Street and widening on Mohouli Street, could reduce critical volumes so that the intersection can operate at under capacity condition.

With the extension, the new eastbound approach on Mohouli Street should have separate lanes for left turns, through traffic, and right turns. For normal eight-phase operation in which left turns move protected from opposing traffic followed by opposing through traffic, the estimated traffic would be served at desirable under capacity conditions. Table 3 summarizes the analysis.

Table 3
Mohouli Street and Komohana Street
Intersection Capacity Analysis

Peak Hour:	AM Peak Hour		PM Peak Hour	
Without Project:				
Mohouli St., westbound	31		255	
Komohana St., Left Turn (southbound)	550		204	
Komohana St., Through Movements	795		395	
Total Critical Volume	1,376		854	
Condition	near capacity		under capacity	
With Project:				
Mohouli St., Left Turn	254	(EB)	456	(WB)
Mohouli St., Opposing Movements	153		102	
Subtotal	407		558	
Komohana St., Left Turn	278	(SB)	316	(NB)
Komohana St., Opposing Movement	378		240	
Subtotal	656		556	
Total Critical Volume (sum subtotals)	1,063		1,114	
Condition	near capacity		under capacity	

EB = eastbound, WB = westbound, SB = southbound, NB = northbound

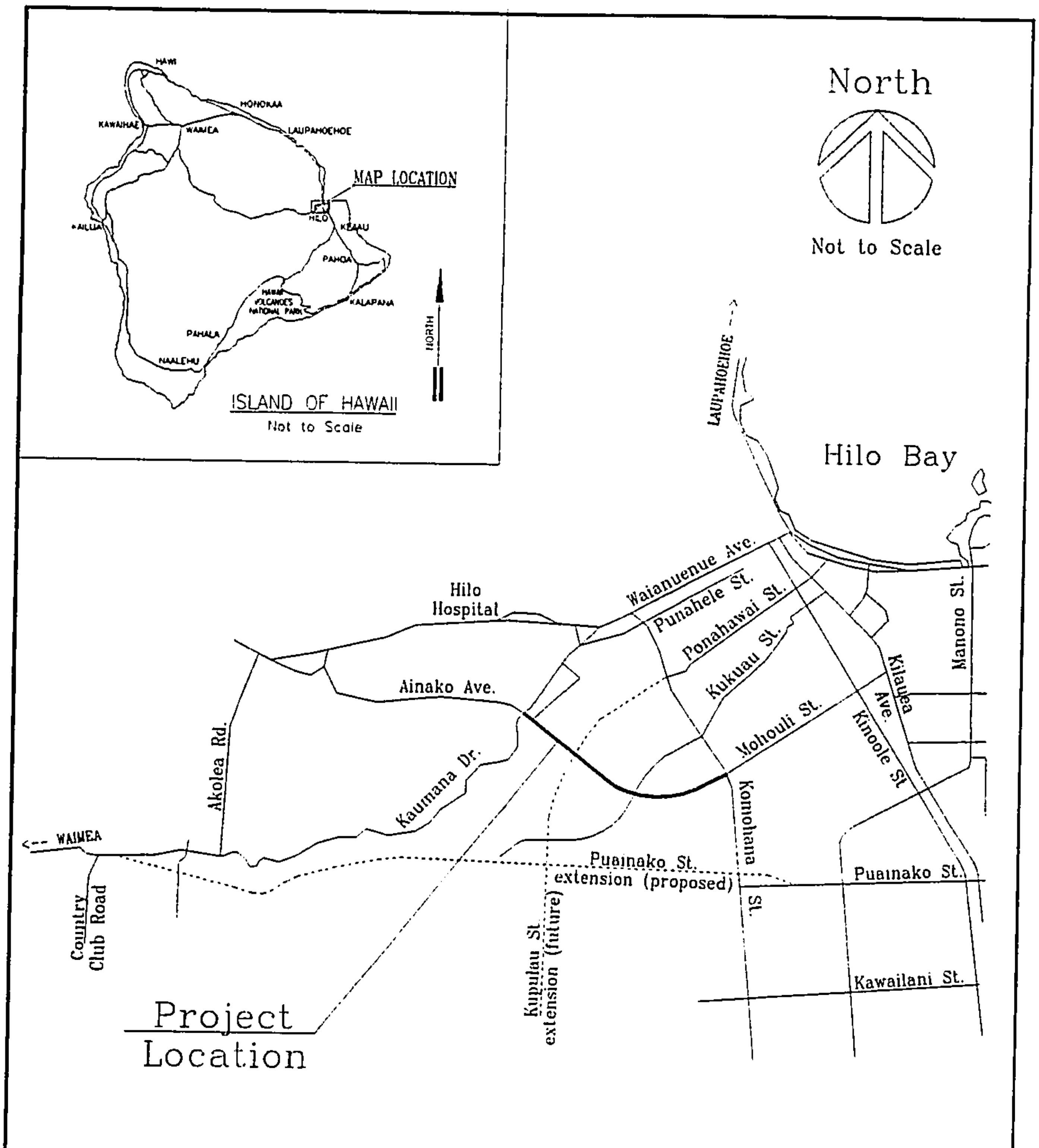
Other Traffic Impacts - Without the Mohouli Street extension, daily traffic volumes on Komohana Street would be greater than 15,000 vpd north of Mohouli Street (Exhibit 2); widening of this portion of Komohana Street would be necessary. With the extension of Mohouli Street, the widening of Komohana Street north of Kukuau Street may not be necessary. Other significant impacts to traffic in the area due to the extension of Mohouli Street include the reduction of traffic on Kaumana Drive between Ainako Avenue and Waianuenue Avenue, a reduction in traffic on Punahele Street, a shifting of some traffic from Waianuenue Avenue to Ainako Avenue, and an increase in traffic on Mohouli Street east of Komohana Street.

Conclusions and Recommendations - The proposed project will provide an alternative access to the Kaumana area and redistribute traffic. Reductions in traffic volumes on portions of Komohana Street, Waianuenue Avenue, Punahele Street, and Kaumana Drive are also expected with the proposed project.

The new portion of Mohouli Street between Komohana Street and Kaumana Drive is estimated to carry a volume of nearly 15,000 vehicles per day and a single lane in each direction should be adequate; provision for future restriping for additional lanes should be provided. At intersections, the analyses indicate that separate left turn lanes would be needed to provide adequate capacities, and a separate right turn lane on the eastbound approach to Komohana Street, where high volumes of right turns are expected, should also be provided. Exhibits 4, 5, and 6 illustrate the approach laneage which should be provided within the project limits.

Traffic signals at the intersections of Ainako Avenue and Kaumana Drive and of Mohouli and Komohana Streets have been programmed for installation prior to the extension of Mohouli Street. Upgrades to the traffic signal systems at these intersections, including relocation and additional signal heads and detectors, should be designed and installed as part of the extension project.

***



Traffic Assessment Mohouli Street Extension	Location Map Hilo, Hawaii	Exhibit 1
	prepared by: Julian Ng, Inc. August 1996	

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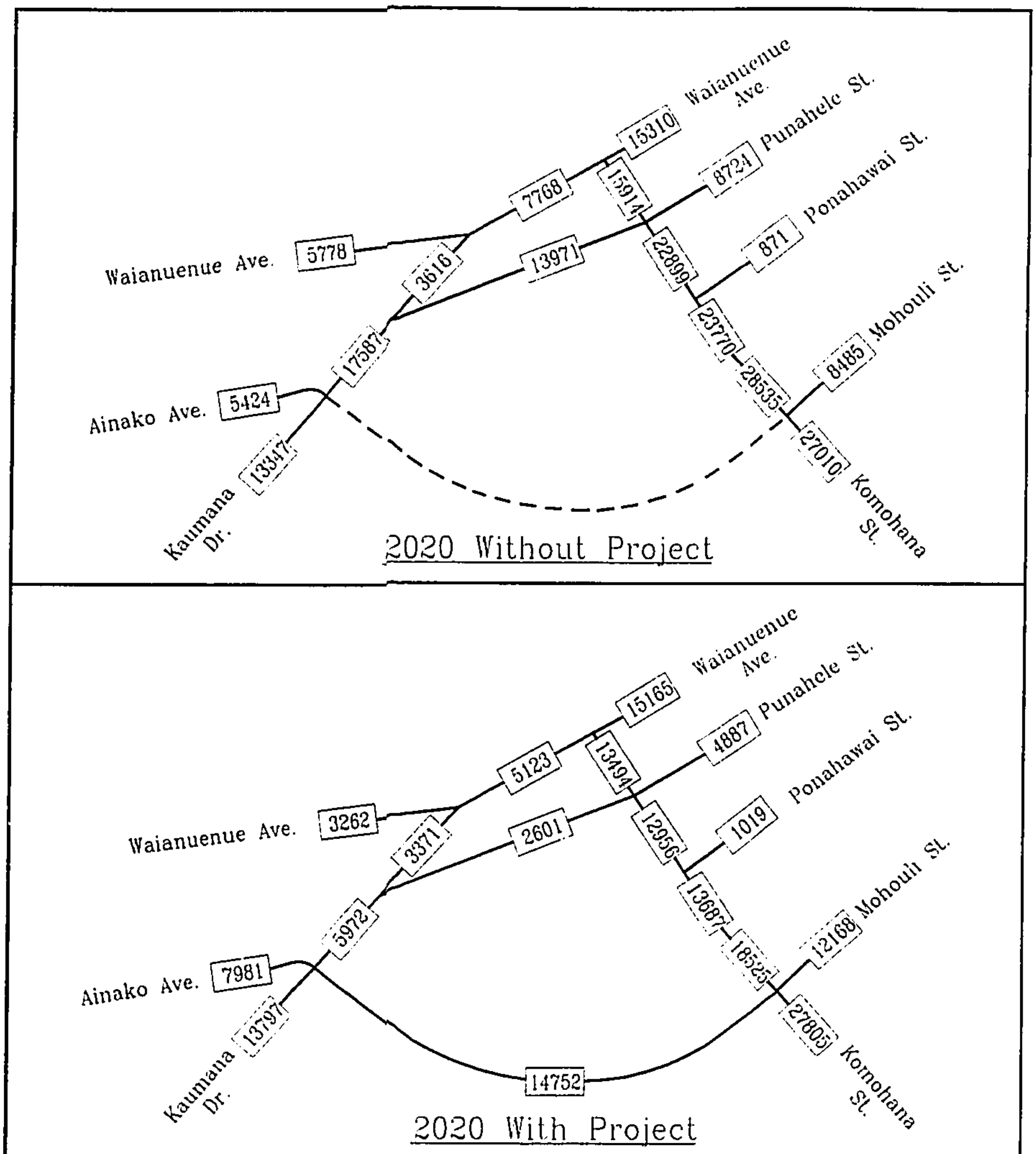

Traffic Assessment Mohouli Street Extension	Model Projections Year 2020 Daily Traffic prepared by: Julian Ng, Inc. August 1996	Exhibit 2

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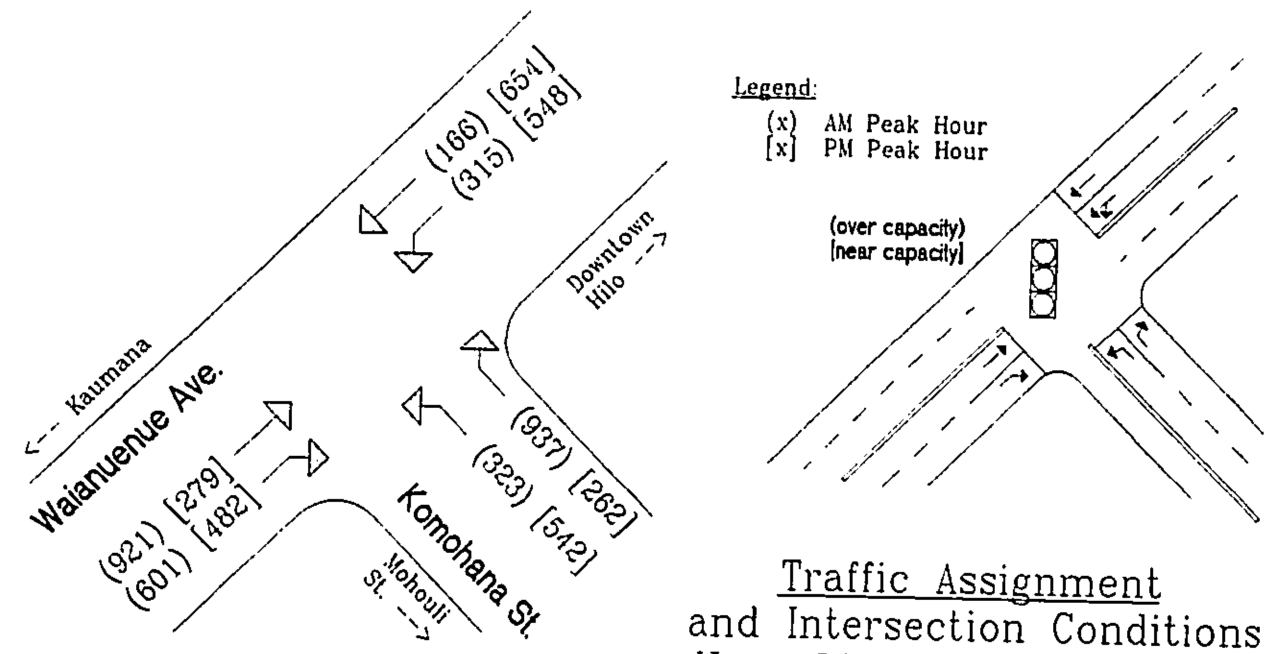
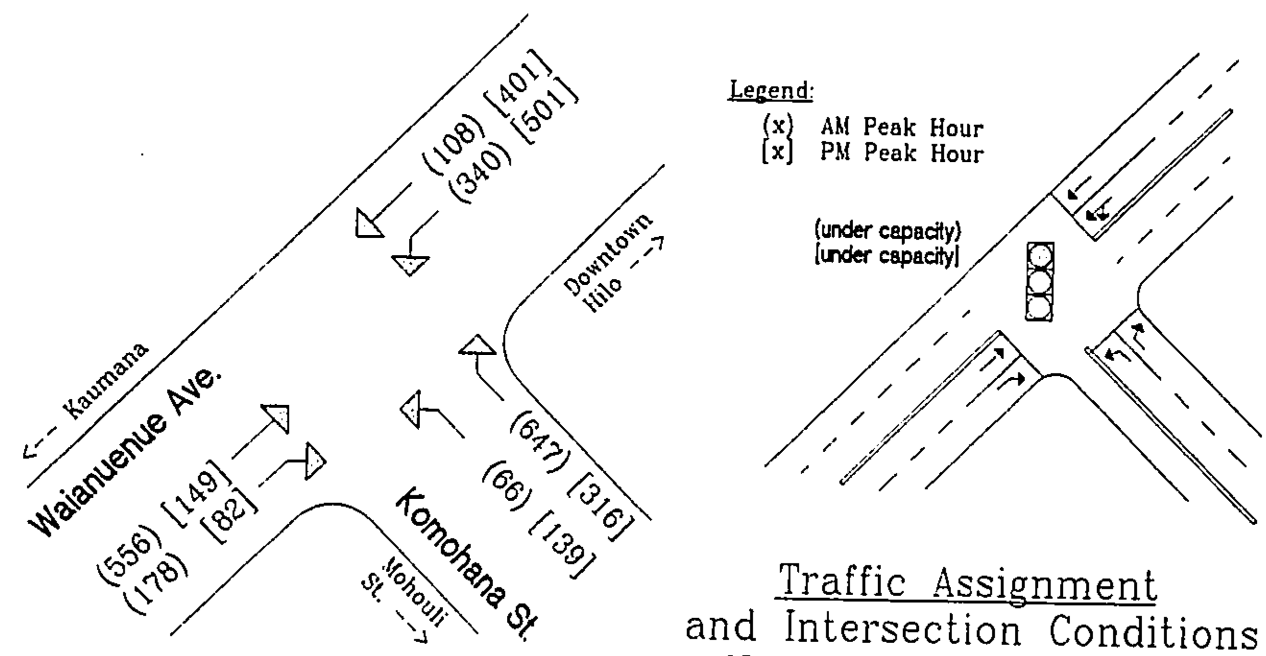
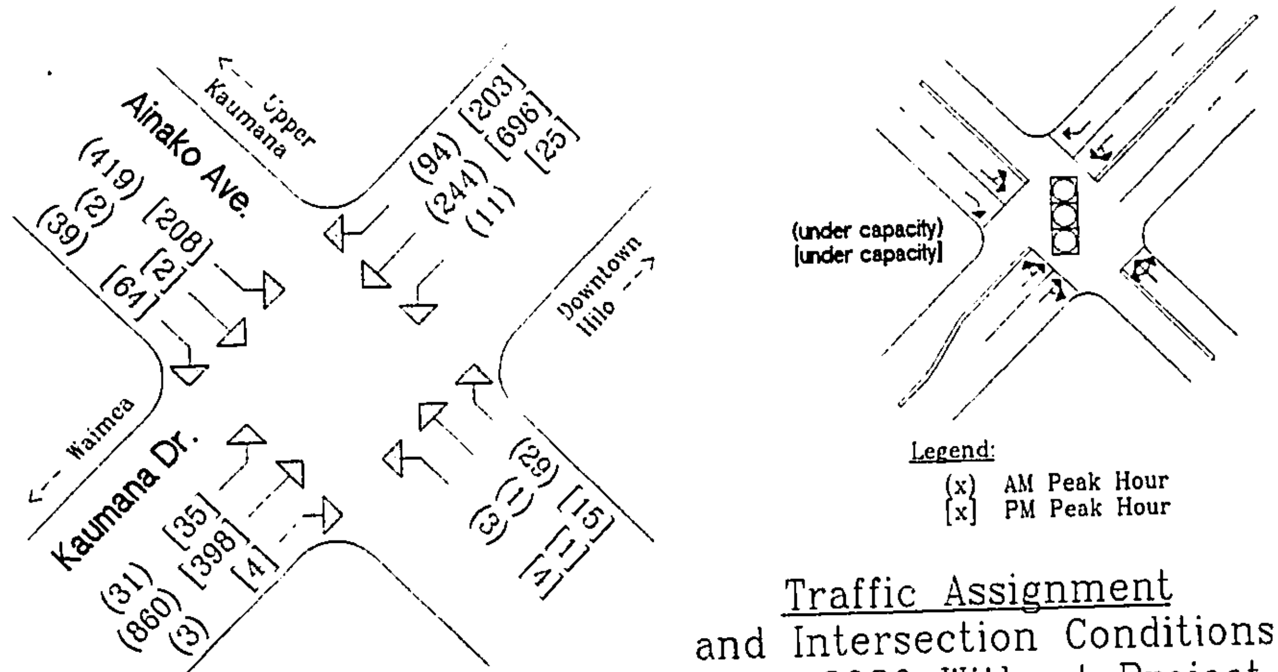


Traffic Assignment
and Intersection Conditions
Year 2020 Without Project



Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Traffic Assessment Mohouli Street Extension	Komohana Street & Waianuenue Avenue prepared by: Julian Ng, Inc. August 1996	Exhibit 3



Traffic Assignment
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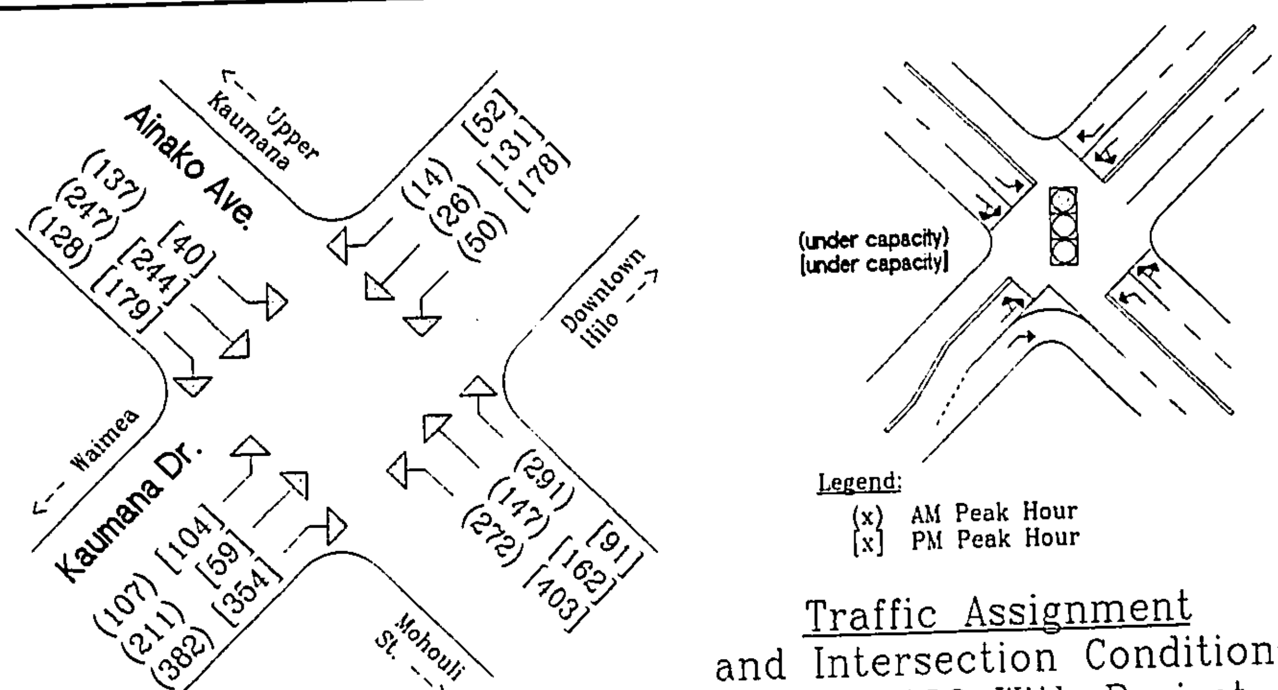
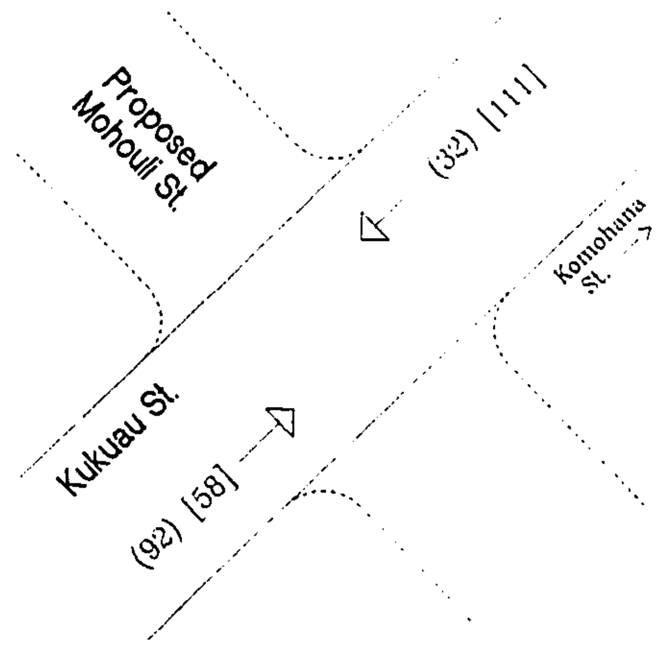
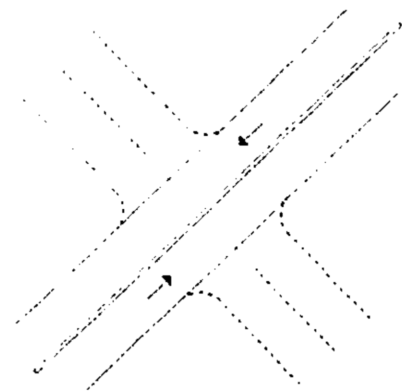
Year 2020 Without Project



Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Traffic Assessment Mohouli Street Extension	Ainako Avenue & Kaumana Drive prepared by: Julian Ng, Inc. August 1996	Exhibit 4

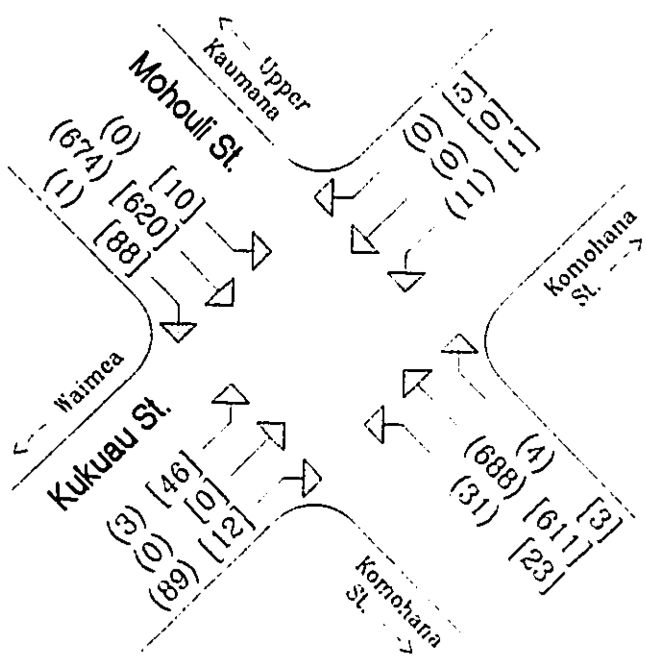


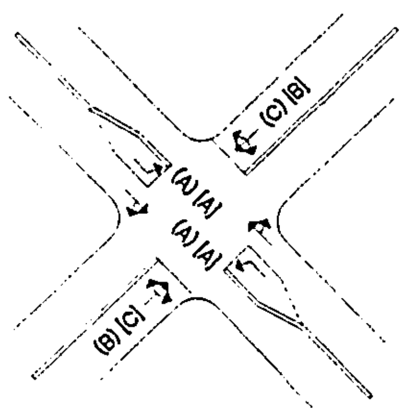


Legend:

(x) AM Peak Hour
[x] PM Peak Hour

Traffic Assignment
and Intersection Conditions
Year 2020 Without Project





Legend:

(x) AM Peak Hour
[x] PM Peak Hour
A Level of Service

Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Traffic Assessment Mohouli Street Extension	Mohouli Street & Kukuau Street prepared by: Julian Ng, Inc. August 1996	Exhibit 5

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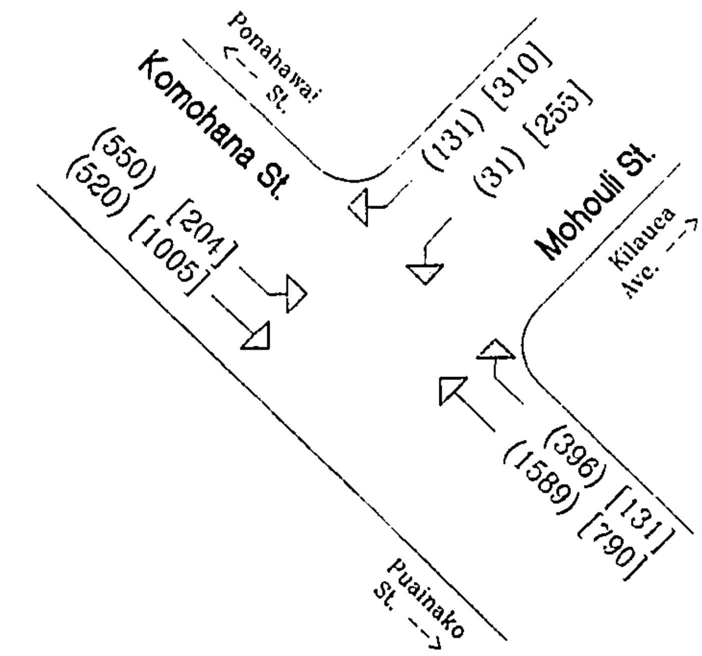

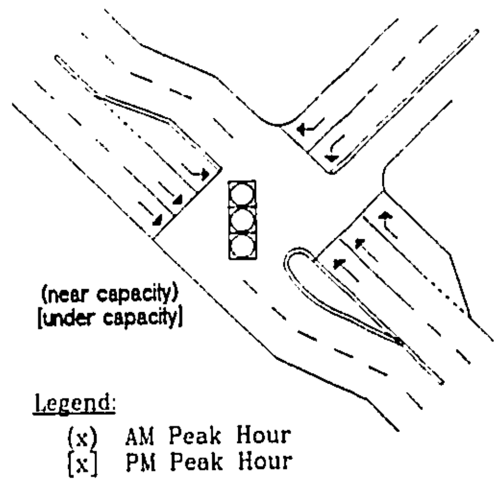

Traffic Assignment
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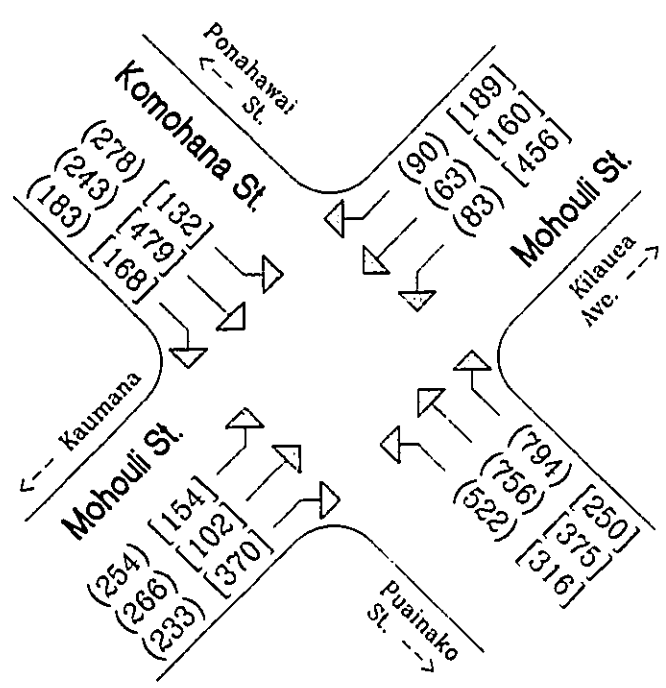
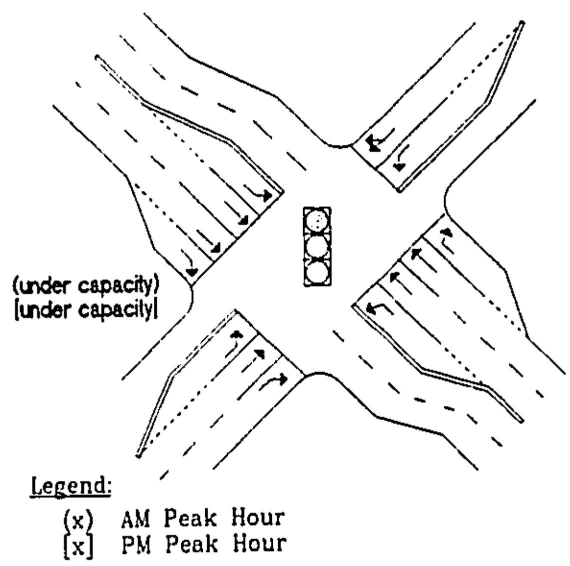
Year 2020 Without Project





Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Traffic Assessment	Mohouli Street & Komohana Street	Exhibit
Mohouli Street Extension	prepared by: Julian Ng, Inc. August 1996	6

\MOHOULI\EXHF-AS.D 03/18/97

ORIGINAL FILED

Julian Ng, Incorporated
P. O. Box 816 Kaneohe, Hawaii 96744-0816
phone: (808) 236-4325
fax: (808) 235-8869

Facsimile Transmittal

Date: October 15, 1997

To: Mr. Bruce Meyers
Okahara & Associates, Inc **@ Fax #:** (808) 961-5529

From: Julian Ng

Re: Mohouli Street Extension This is Sheet 1 of 4

Attached:

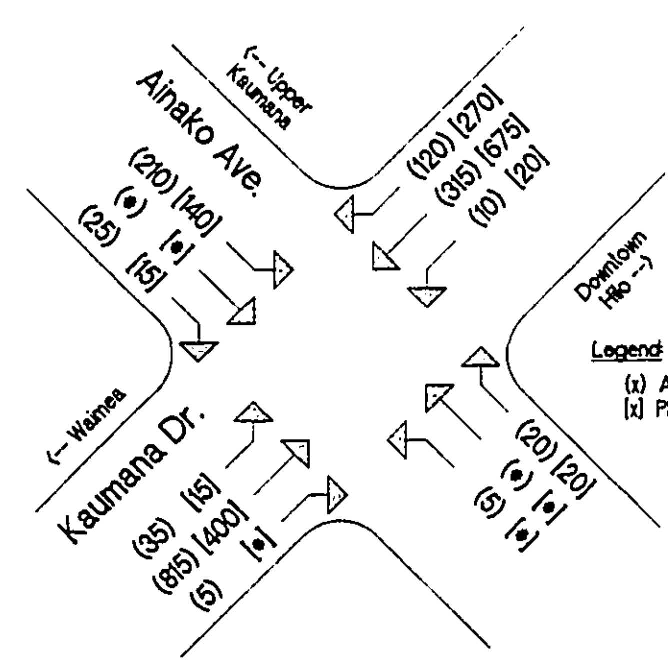
revised exhibits (numbered 4, 5, 6) dated October 1997

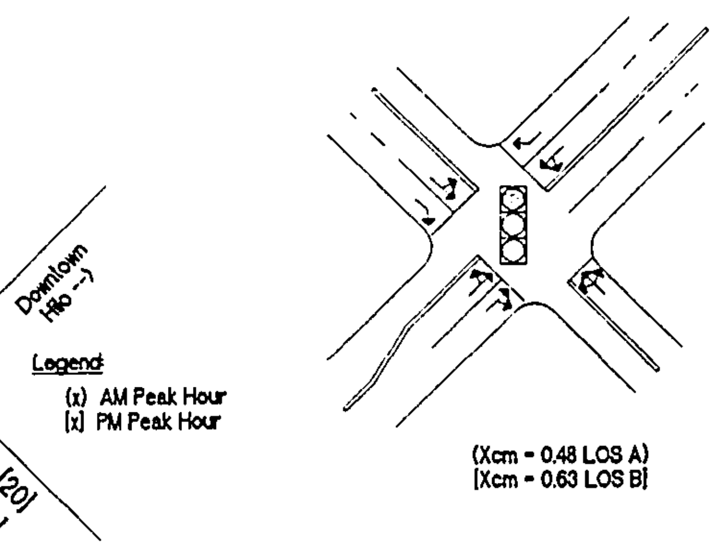
Message:

As discussed with you, we have revised the traffic assignments and laneage requirements for the Mohouli Street intersections. These revisions should be used for the storage lengths on the turn lanes.

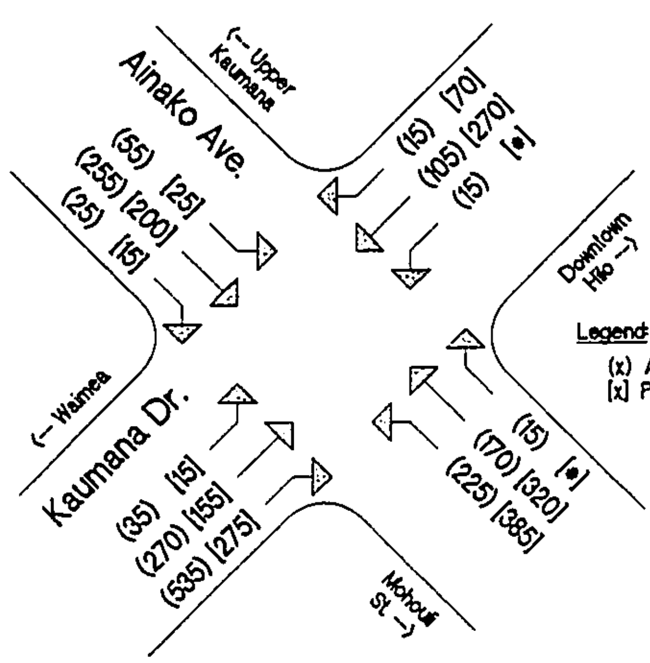
These revisions are based on traffic counts collected by the State Highways Division in 1996 (these became available in February 1997 and had not been incorporated into the traffic report for the environmental assessment). The 1996 counts showed increased daily volumes, but in some cases, peak hour volumes were lower than those shown in the 1994 counts.

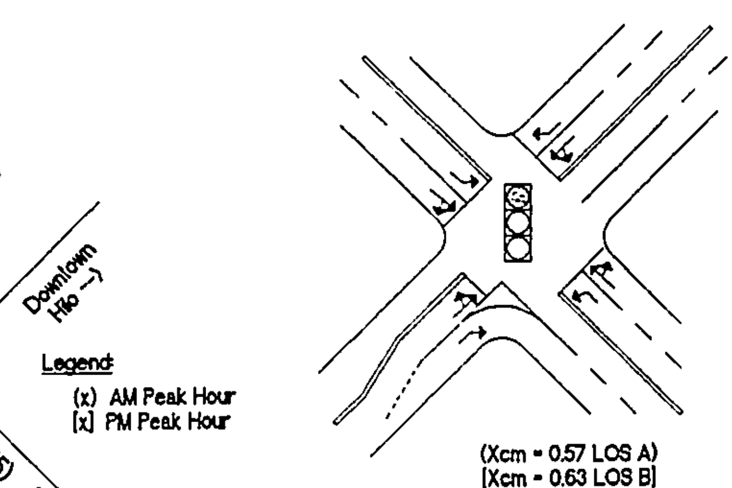
The procedure used in the report, ("K" factors, which are the peak hour volumes divided by daily volumes, were first used to compute the approach and departure volumes on each leg, then the volumes at the intersection were balanced to estimate turn volumes) was applied to new "K" factors from the 1996 counts. An additional step was added: the with-project and without-project assignments were compared and adjusted where necessary so that the project impacts made sense.





Traffic Assignment
and Intersection Conditions
Year 2020 Without Project





Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Revised Traffic Assignments Mohouli Street Extension	Ainako Avenue and Kaumana Drive prepared by: Julian Ng, Inc. October 1997	Exhibit 4

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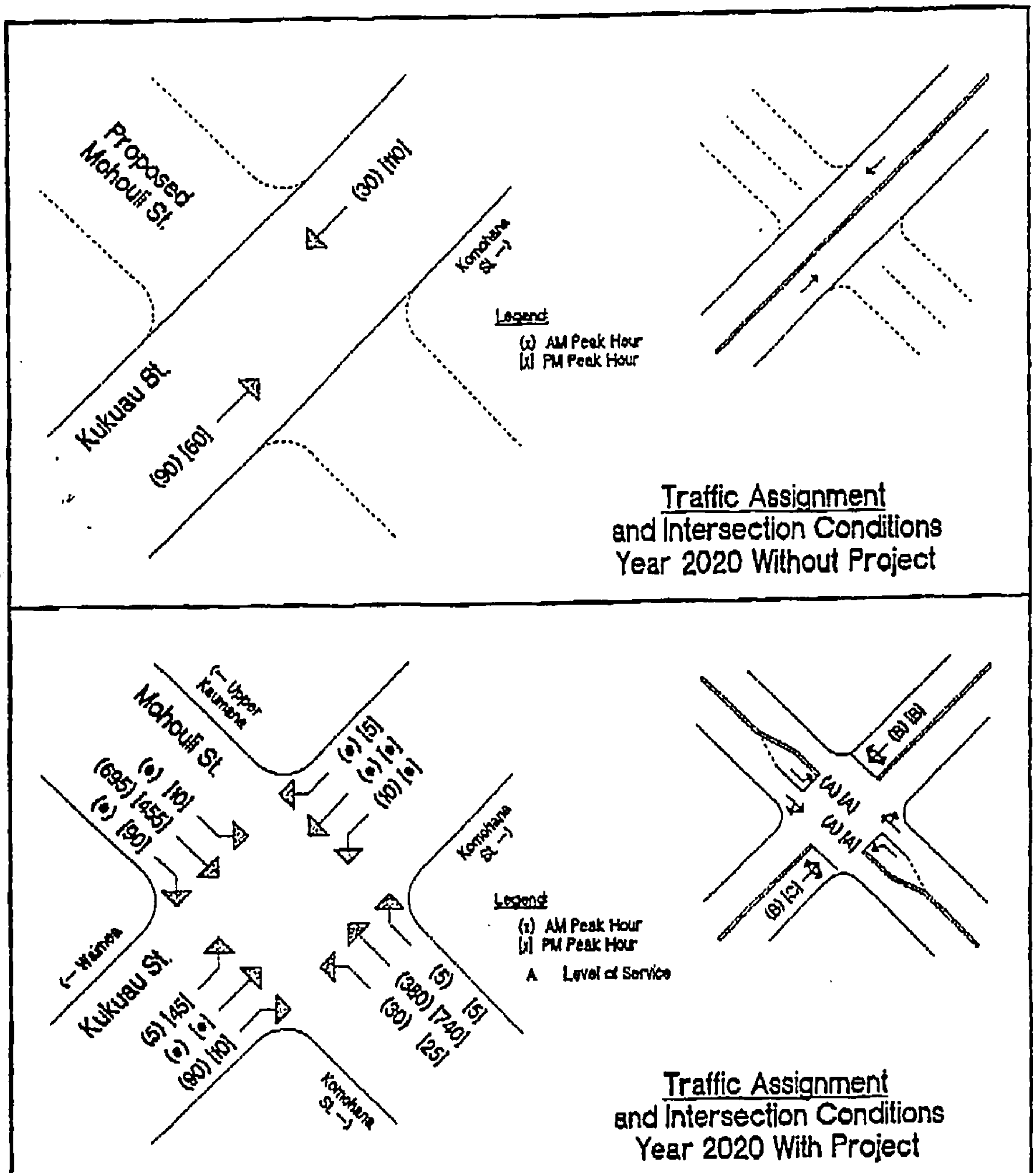
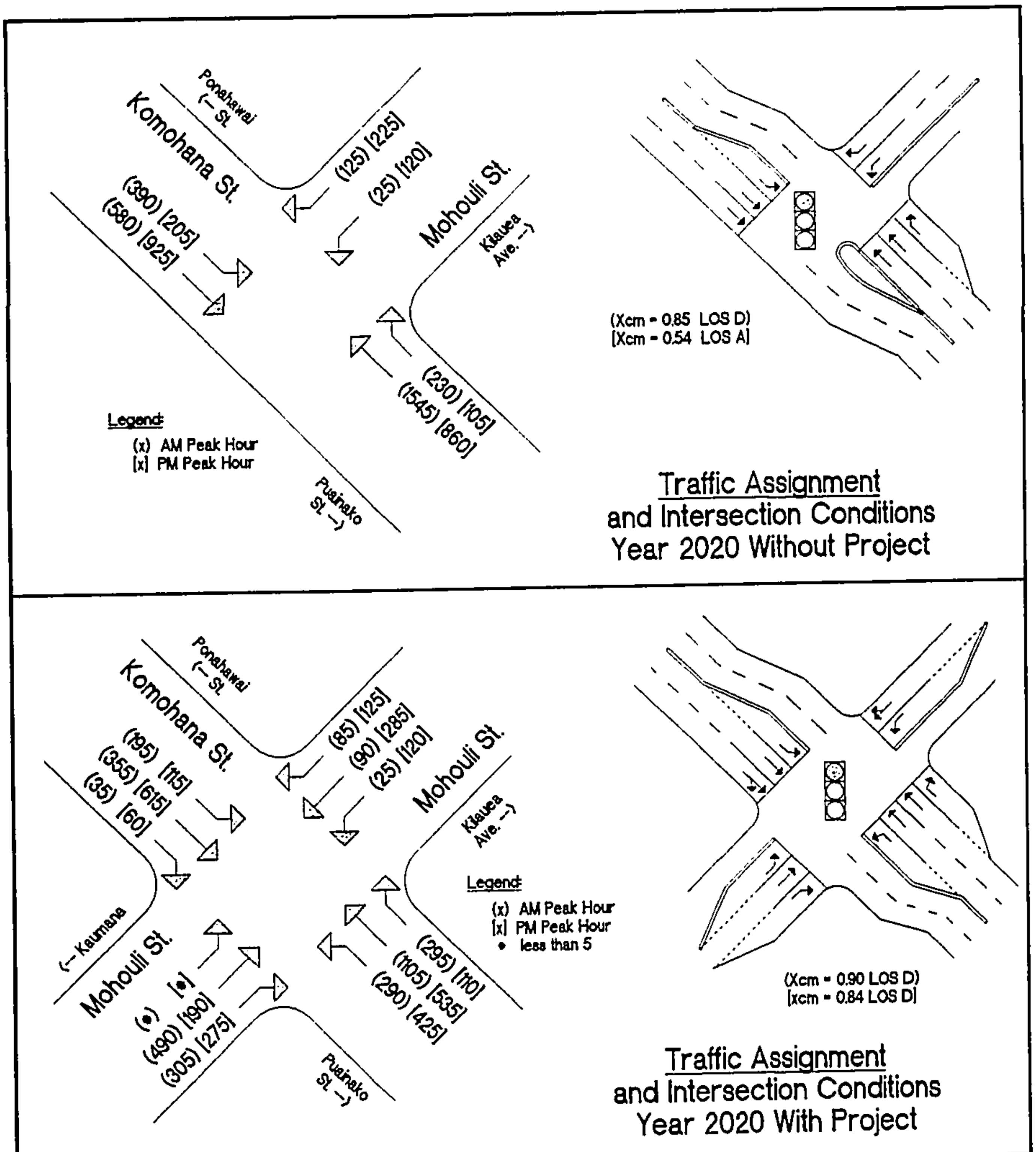


Revised Traffic Assignments Mohouli Street Extension	Mohouli Street and Kukuau Street prepared by: Julian Ng, Inc. October 1997	Exhibit 5



Revised Traffic Assignments

Mohouli Street Extension

Mohouli Street and Komohana Street

prepared by: Julian Ng, Inc. October 1997

Exhibit 6

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Appendix 2

AIR QUALITY STUDY
FOR
MOHOULI STREET EXTENSION

AIR QUALITY STUDY
FOR THE PROPOSED
MOHOULI STREET EXTENSION PROJECT

HILO, HAWAII

Prepared for:

Y.K. HAHN & ASSOCIATES

July 1996

B. D. NEAL & ASSOCIATES

Applied Meteorology • Air Quality • Computer Science

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CONTENTS

FIGURES

TABLES

1.0 SUMMARY

As one of several roadway improvement projects in the Hilo, Hawaii area, the County of Hawaii is proposing to construct the Mohouli Street Extension from the present intersection of Mohouli Street and Komohana Street westward to Kaumana Drive. The project will provide an alternative access to the Kaumana area of Hilo. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed roadway facilities through the year 2020. Mitigative measures are suggested where possible and appropriate to lessen any potential air quality impacts from the project.

At the present time, air quality standards have been established by both federal and state governments which limit ambient concentrations of particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. In addition, a state standard has been established for hydrogen sulfide. Hawaii state air quality standards are more stringent than the comparable national limits except for the standards for sulfur dioxide, particulate matter and lead, which are set at the same levels.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the Hilo area is very much affected by its windward and coastal situation. Daytime winds are predominantly trade winds from easterly to northerly directions, while nighttime winds are mostly mountain drainage winds from the southwest. Wind speeds typically are relatively light varying between about 5 and 10 miles per hour. Temperatures in the Hilo area are very moderate with average daily minimum and maximum temperatures ranging from 66°F to 82°F. Rainfall is substantial with an average of 129 inches per year.

Except for occasional impacts from nearby volcanic emissions and possibly occasional localized impacts from traffic congestion, the present air quality of the project area is believed to be relatively good. The little air quality data that are available for the area from the Department of Health indicate that concentrations are well within state and federal air quality standards.

If the proposed project is given the necessary approvals to proceed, it is probably inevitable that some short-term impacts on air quality will occur either directly or indirectly during project construction. Short-term impacts from fugitive dust will likely occur, and increased emissions from traffic disruption may also affect air quality during the period of construction. State air pollution control regulations prohibit visible emissions of fugitive dust. Hence, an effective dust control plan should be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions.

The high rainfall in the project area should serve to naturally control construction dust, but it is recommended that during prolonged dry periods that active work areas be watered at least twice daily. A minimum dust control plan should also include provisions for keeping adjacent paved roadways free of tracked dirt. Increased emissions from traffic disruption can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours and by minimizing road closures during peak-traffic periods.

After construction, vehicles traversing the proposed extension of Mohouli Street will result in a long-term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, an air quality modeling study was undertaken to estimate current ambient concentrations of carbon monoxide and to predict future levels both without and with the proposed project in the year 2020. The two intersections which would potentially be connected by the Mohouli Street Extension were studied. These intersections are Mohouli Street with Komohana Street and Kaumana Drive with Ainako Avenue. During worst-case conditions, model results indicated that present 1-hour carbon monoxide concentrations are within the national standard but could exceed the state ambient air quality standard during both morning and afternoon peak hours at the intersection of Mohouli Street and Komohana Street and during the morning peak hour at the intersection of Kaumana Drive and Ainako Avenue. Model results also indicated that presently both the state and national 8-hour carbon monoxide standards could be exceeded during worst-case situations.

In the year 2020 without the project, worst-case 1-hour concentrations were predicted to continue to exceed the state standard during both peak hours at both locations. Both locations, however, were predicted to remain within the less stringent national 1-hour standard. The state 8-hour carbon monoxide standard was predicted to be exceeded at both locations and the intersection of Mohouli Street and Komohana Street was predicted to exceed the national 8-hour standard as well.

With the project in the year 2020, worst-case 1-hour concentration levels within the project area would increase and would continue to exceed the state standard while remaining within the national standard. Both locations were found to produce predicted worst-case concentrations in excess of the state and national 8-hour standards.

It should be noted here that, because the state standards are set at such stringent levels, it is likely that they are currently exceeded at many locations in the state that have even moderate traffic volumes. Although potential exceedance of the national 8-hour standard is also indicated either with or without the project, the projected 8-hour concentrations are probably less reliable than the 1-hour estimates due to the prediction methodologies involved.

Options available to mitigate long-term, traffic-related air pollution are generally to further improve roadways, to reduce traffic or to reduce individual vehicular emissions. Based on the air quality modeling results, it may be appropriate to consider the feasibility of further improving some intersections in the project area, particularly the intersection of Mohouli Street and Komohana Street. Aside from providing added roadway improvements, air pollution impacts from vehicular emissions could conceivably be additionally mitigated by reducing traffic volumes through the promotion of bus service and car pooling and/or by adjusting local school and business hours to begin and end during off-peak times. This mitigation measure, however, is generally considered only partially successful. Reduction of emissions from individual vehicles is generally beyond the control of any single development and would have to be achieved through the promulgation of county, state or federal air pollution control regulations. For example, Hawaii currently does not require annual inspections of motor vehicle air pollution control equipment. Although this has been proposed in past legislative sessions, there currently is no indication that the state is contemplating adopting such rules.

Another potential mitigation measure might be to provide added buffer zones between walkways and roadways where space is available. Technically, however, the public would have to somehow be excluded from the buffer zones. The predicted worst-case concentrations in this report are based on a separation distance of 3 m (10 ft) between walkways and roadways. Doubling this distance to about 6 m (20 ft) would reduce maximum concentrations in some cases by about 10 to 15 percent.

It may also be possible to reduce worst-case concentration levels by reducing speed limits in the project area, particularly along

Komohana Street. This would help reduce acceleration emissions in the vicinity of roadway intersections. Reducing the speed limit on Komohana Street from 45 mph to 35 mph, for example, could reduce maximum concentrations by about 25 to 35 percent.

2.0 INTRODUCTION AND PROJECT DESCRIPTION

The County of Hawaii is proposing an extension of Mohouli Street in Hilo from its intersection with Komohana Street westward to the intersection of Kaumana Drive and Ainako Avenue. The project would provide an alternative access to the Kaumana Area of Hilo.

The purpose of this study was to evaluate the potential air quality impacts of the proposed project and recommend mitigative measures, if possible and appropriate, to reduce or eliminate any degradation of air quality in the area. Before examining the potential impacts of the proposed project, a discussion of ambient air quality standards is presented and background information concerning the regional and local climatology and the present air quality of the project area is provided.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of primary and secondary standards. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

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

State of Hawaii AAQS are in some cases considerably more stringent than comparable national AAQS. In particular, the State of Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit, and the state 1-hour limit for ozone is more than two times as stringent as the federal standard.

Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make the state standards essentially the same as the national limits. In 1993, the state also revised its particulate standards to follow those set by the federal government. It has been proposed in various forums that the state also relax its carbon monoxide standards to the national levels, but at present there are no indications that such a change is being considered.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

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

The entire state of Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east of the islands. Areas along the eastern coasts of the islands are particularly affected by the trade winds and are usually well-ventilated nearly year round. Although Hilo is situated along the eastern coast of Hawaii Island, the high mountains of Mauna Loa and Mauna Kea significantly modify the trade wind influence. The nearest long-term wind data available for the project area are collected at the Hilo Airport located about 3 miles to the east. These data are probably at least semi-representative of the project corridor. Mean annual wind speed at the airport is about 8 mph, which is lower than many windward locations in the state, and wind directions are bimodal showing either a northeast or southwest preference [1]. Northeast trade winds typically occur during the daytime, while winds from the southwest typically occur during the nighttime due to cold air drainage from the mountains. Winds from the south or southwest also occur occasionally in association with winter storms.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from stack sources. In Hawaii, the annual and daily variation of temperature depends to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. At nearby Hilo Airport, average annual daily minimum and maximum temperatures are 66°F and 82°F, respectively. The extreme minimum temperature on record is 53°F, and the extreme maximum is 94°F [2]. Temperatures in the project corridor are probably very similar.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is oftentimes measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the project area, stability class 5 or 6 is probably the highest stability class that occurs, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights at most locations in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Hilo area has a wet climate. Normal annual rainfall for Hilo Airport is about 129 inches [2]. This is distributed fairly evenly throughout the year, although the summer months are slightly drier.

5.0 PRESENT AIR QUALITY

Air quality in the vicinity of the proposed project is currently mostly affected by emissions from motor vehicles, industry and natural sources. Perhaps the dominant factor for the past several years has been the volcanic emissions from Kilauea Volcano, although the prevailing winds carry emissions away from the Hilo area much of the time. Most of these emissions occur as sulfur dioxide and then convert into particulate sulfate which causes a volcanic haze (vog) to blanket the area during Kona wind conditions. The major industrial sources in the area are oil-burning power plants which primarily emit sulfur dioxide, nitrogen oxides and particulate matter. Motor vehicles emit carbon monoxide, nitrogen oxides, hydrocarbons (an ozone precursor) and smaller amounts of other pollutants.

The State Department of Health (DOH) operates a network of air quality monitoring stations at various locations around the state. Each station, however, typically does not monitor the full complement of air quality parameters. Very little data are available for the Hilo area. During 1985, DOH collected samples of 24-hour average particulate matter and sulfur dioxide concentrations at the University of Hawaii-Hilo campus [3]. These data indicated that concentrations were well within standards, and monitoring was discontinued. Other data have been collected and reported since 1985 in connection with electrical power development in Hilo and Puna, but these data have not been published to date by DOH.

Although there are no air quality data to substantiate this, it is probable that the more stringent state standards pertaining to carbon monoxide are exceeded on occasion near high-volume intersections in the project area during periods of coincident traffic congestion and poor dispersion conditions.

6.0 SHORT-TERM IMPACTS OF PROJECT

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

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [4] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions in the project area would likely be lower due to the wet climate. In any case, State of Hawaii Air Pollution Control Regulations [5] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

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

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

Project construction activities will also likely obstruct the normal flow of traffic to such an extent that overall vehicular emissions in the project area are increased. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment to and from construction areas during periods of low traffic volume.

7.0 LONG-TERM IMPACTS OF PROJECT

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic on nearby roadways, potentially causing long-term impacts on ambient air quality in the project vicinity. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide, and they also emit nitrogen oxides and other contaminants.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the President signed into law the Clean Air Act Amendments. This new legislation requires further emission reductions be phased in beginning in 1994. The combination of current and new restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles leave the state's roadways. Carbon monoxide emissions, for example, will go down by about 15 percent on the average during the next 10 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered to be a microscale problem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single roadway improvement.

For this project, three scenarios were selected for the carbon monoxide modeling study: year 1996 with present conditions, year 2020 without the project, and year 2020 assuming the project is complete and fully utilized. To begin the modeling study, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, the two intersections on either end of the proposed roadway extension were selected for air quality analysis. These were Mohouli Street at Komohana Street and Kaumana Drive at Ainako Avenue. Both intersections are presently stop-controlled but will be signalized in both of the future cases. Intersection configurations and traffic conditions at each of these locations are detailed in the traffic impact report for the project [6].

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concentrations for each of the three scenarios studied. To evaluate the significance of the estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS will provide another measure of significance.

The traffic impact report for the project indicates that traffic volumes will be higher during the morning peak hour than during the afternoon peak period. Coincidentally, worst-case emission and meteorological dispersion conditions typically occur during the morning hours at most locations. Thus, the highest concentrations could be expected to occur during the morning peak traffic period. However, to ensure that there were no unusual traffic queuing conditions during the afternoon and that worst-case concentrations were identified, both morning and afternoon peak-traffic hours were examined for each scenario.

The EPA computer model MOBILE5A [7] was used to calculate vehicular carbon monoxide emissions for each year studied. This model is the most recently released version of the EPA mobile emission models. Emission estimates provided by the MOBILE5A model have been updated based on EPA's recent testing of on-road vehicles. This latest series of tests has indicated that emission control equipment deteriorates more rapidly than had been previously thought. Hence, MOBILE5A emission estimates are higher (in some cases as much as twice as high) compared to emission estimates derived from earlier versions of the model, particularly in states like Hawaii that have no inspection and maintenance program for emission control equipment.

One of the key inputs to the MOBILE5A emission model is vehicle mix. Based on recent vehicle registration figures, the present and projected vehicle mix in the project area is estimated to be 91.9% light-duty gasoline-powered vehicles, 5% light-duty gasoline-powered trucks and vans, 0.5% heavy-duty gasoline-powered vehicles, 0.6% light-duty diesel-powered vehicles, 1% heavy-duty diesel-powered trucks and buses, and 1% motorcycles.

Other key inputs to the MOBILE5A emission model are the cold/hot start fractions. Motor vehicles operating in cold- or hot-start modes emit excess air pollution until reaching stabilized operating temperatures. Typically, motor vehicles reach stabilized operating temperatures after about 4 miles of driving. For traffic operating on surface streets around the project area, it was assumed that during both morning and afternoon peak traffic hours about 25 percent of all vehicles would be operating in the cold-start mode and that about 5 percent would be operating in the hot-start mode. These operational mode values were estimated based on a report from the California Department of Transportation [8] and taking into consideration the likely origins of morning/afternoon traffic in the project area.

Ambient temperatures of 59 and 68 degrees Fahrenheit were used for morning and afternoon peak-hour emission computations, respectively. These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this and emission estimates given by MOBILE5A are inversely proportional to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE5A, these data were then input to an atmospheric dispersion model. EPA air quality modeling guidelines [9] currently recommend that the computer model CAL3QHC [10] be used to assess carbon monoxide concentrations at roadway intersections, or in areas where its use has previously been established, CALINE4 [11]. CALINE4 has been used extensively in Hawaii to assess air quality impacts at roadway intersections. Each of these two computer models offers advantages and disadvantages. CAL3QHC has the capability to make vehicle queuing estimates, but it does not simulate modal emissions. CALINE4 has the capability to simulate modal emissions, but it does not have the capacity to make queuing estimates.

Since the use of CALINE4 has previously been established in Hawaii, CALINE4 was used to perform the analyses for the subject project. However, all vehicle queuing estimates involving signalized intersections were made based on the queuing algorithms included in the CAL3QHC model. This approach takes advantage of the best features of both models. Queuing estimates for unsignalized intersections were made based on capacity analysis procedures [12] and transportation queuing theory [13].

CALINE4 was developed by the California Transportation Department to simulate vehicular movement and atmospheric dispersion of vehicular emissions. This model is designed to predict 1-hour average pollutant concentrations along roadways based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Input peak-hour traffic data were obtained from the traffic study cited previously. Vehicles using Komohana Street were assumed to accelerate to 45 mph, while traffic on Mohouli Street, Drive and

Ainako Avenue was assumed to move at 35 mph. These are the current posted speed limits. A deceleration/acceleration time of 20 seconds was assumed for vehicles traveling at 45 mph, whereas a value of 16 seconds was assumed for those traveling at 35 mph.

Model roadways were set up to reflect roadway geometry, physical dimensions and operating characteristics. Concentrations predicted by air quality models generally are not considered valid within the roadway mixing zone. The roadway mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of a cross street. For this study, model receptor sites were located at the edges of the mixing zones where the maximum concentrations would likely occur, whether or not sidewalks currently exist. All receptor heights were placed at 1.8 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 5 was assumed for morning scenarios and stability category 4 was assumed for afternoon cases. These are the most conservative stability categories that are generally used for estimating worst-case pollutant dispersion at suburban locations. A surface roughness length of 100 cm and a mixing height of 300 meters was used in all cases. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at relatively low levels. Hence, background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were accounted for by adding a small background concentration of 0.5 ppm to all predicted concentrations for 1996. Although at least moderate development and increased traffic are expected to occur within the project area within the next several years, background carbon monoxide concentrations may not change significantly since individual emissions from motor vehicles are forecast to decrease substantially. Hence, a background value of 0.5 ppm was assumed to persist for the 2020 scenarios.

Predicted Worst-Case 1-Hour Concentrations

Table 2 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. Estimated worst-case carbon monoxide concentrations are presented in the table for the year 1996 with existing traffic and for the year 2020 both with and without project traffic. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the highest estimated 1-hour concentration within the project vicinity for the present (1996) case was 29.3 mg/m^3. This was projected to occur during the morning peak traffic hour near the intersection of Mohouli Street and Komohana Street and was mainly attributable to traffic queuing in the southbound left turn lane of Komohana Street. The afternoon predicted concentration at this intersection was somewhat lower at 25.0 mg/m^3. The morning predicted concentration at the Kaumana Drive/Ainako Avenue intersection was comparable at 25.2 mg/m^3, due mainly to eastbound traffic on Ainako Avenue. However, this location produced an estimated concentration of only 9.1 mg/m^3 during the *afternoon peak hour* when the eastbound volume was considerably lighter. All estimated 1-hour concentrations are within the national standard of 40 mg/m^3, but only Kaumana Drive at Ainako Avenue during the afternoon peak hour is within the more stringent state limit of 10 mg/m^3.

In the year 2020 without the proposed project, the highest worst-case 1-hour concentration in the project area, 30.0 mg/m^3, was predicted to occur during the morning near the intersection of Mohouli and Komohana Streets. Although morning peak hour traffic volume was forecast to increase by about one-third over 1996, this is only slightly more than the present case predicted concentration due mainly to intersection improvements including the installation of a traffic signal. Northbound traffic queuing on Komohana Street contributed heavily to the morning estimate. In the afternoon this location produced an estimated concentration of 20.7 mg/m^3, about 17 percent lower than the 1996 prediction. The 18.6 mg/m^3 estimated morning concentration at Kaumana Drive/Ainako Avenue dropped by 26 percent compared to the present case. During the afternoon, the predicted maximum concentration of 15.4 mg/m^3 represents a nearly 70 percent increase compared to the 1996 level. In both cases, these changes are mainly attributable to traffic volume increases, signalization and/or laneage additions. All of the four predicted worst-case 1-hour concentrations for this scenario exceeded the state AAQS but all were within the national standard.

Predicted 1-hour worst-case concentrations for the 2020 with project scenario ranged from 16.6 mg/m^3 during the afternoon at the intersection of Kaumana Drive and Ainako Avenue to 35.8 mg/m^3 during the morning at Mohouli Street and Komohana Street. Increases were slight at Kaumana/Ainako when compared to the without project case due to the relatively modest increase in traffic and further intersection improvements. Higher traffic volume at Mohouli/Komohana caused predicted concentrations to rise more substantially at this intersection. The predicted morning concentration increased by 19 percent over the without project case while the afternoon showed a 37 percent rise. Similar to the without project case, all of the predicted worst-case 1-hour concentrations for this scenario exceeded the state AAQS but all were within the national standard.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological dispersion conditions are more variable (and hence more favorable) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One recent study based on modeling [14] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [15] recommend using a value of 0.6 to 0.7 unless a locally derived persistence factor is available. Recent monitoring data for Honolulu reported by the Department of Health suggest that this factor may range between about 0.35 and 0.55 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 will likely yield reasonable estimates of worst-case 8-hour concentration.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 3. For the 1996 scenario, the higher estimated worst-case 8-hour carbon monoxide concentration was 14.7 mg/m^3 near the intersection of Mohouli Street and Komohana Street. The intersection of Kaumana Drive and Ainako Avenue produced an estimated concentration of 12.6 mg/m^3. These exceed both the state standard of 5 mg/m^3 and the national limit of 10 mg/m^3.

The predicted maximum value for the year 2020 without project scenario was 15.0 mg/m^3, occurring again at the intersection of Mohouli Street and Komohana Street. This exceeds both the state and national 8-hour AAQS. The worst-case concentration level near the Kaumana Drive/Ainako Avenue intersection was 9.3 mg/m^3, a 26 percent decrease compared to the present case, and over the state limit but within the national standard.

With the project, the maximum 8-hour concentration in the year 2020 was estimated to occur once again at the intersection of Mohouli and Komohana Streets with a predicted concentration of 17.9 mg/m^3. This represents a 19 percent increase over the 2020 without project case and indicates the continued potential exceedance of both the state and the national 8-hour AAQS. The predicted concentration at the Kaumana Drive/Ainako Avenue intersection increased to 10.3 mg/m^3, 11 percent higher compared to the without project case, and slightly over the national standard.

Conservativeness of Estimates

The results of this study reflect several assumptions that were made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case 1-hour meteorological conditions is that a wind speed of 1 meter per second with a steady direction for one hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is extremely unlikely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above. The 8-hour estimates are also conservative and are probably less reliable than the 1-hour estimates due to the methodology used to compute the estimates. Further, it is unlikely that anyone would occupy the assumed receptor sites (within 3 m of the roadways) for a period of 8 hours.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Although very little ambient air quality data are available to characterize existing conditions, it is likely that state and federal ambient air quality standards are currently being met in the project area, except perhaps for occasional exceedances of the state carbon monoxide standards within small "hot-spot" areas near traffic-congested intersections.

If not controlled properly, fugitive dust emissions during project construction could have a temporary impact on the air quality of areas adjacent to the project. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month or more, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving and establishment of landscaping early in the construction schedule will also help to control dust.

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

After construction, emissions from motor vehicle traffic traveling the proposed roadway extension will occur on a long-term basis. Motor vehicle related emissions of carbon monoxide are the greatest concern. Based on the projected peak-hour traffic volumes and the roadway configurations and laneages given for the project, air quality model projections for the year 2020 indicate that with or without the project the national 1-hour standard for carbon monoxide would be met but that the more stringent state 1-hour standard would likely continue to be exceeded by a wide margin during worst-case conditions near the intersection of Mohouli and Komohana Streets and to a somewhat lesser extent near the intersection of Kaumana Drive and Ainako Avenue. Without the project in the year 2020, air quality model predictions indicate that both the state and the national 8-hour standards for carbon monoxide could continue to be exceeded during worst-case conditions at the Mohouli/Komohana intersection but the national standard would be met at Kaumana Drive/Ainako Avenue. With the project in 2020, air quality modeling estimates indicate potential exceedance of the national 8-hour standard at both intersections studied. However, due to the methodology involved, predicted worst-case 8-hour carbon monoxide concentrations are probably conservatively high and less reliable than the 1-hour estimates.

Options available to mitigate long-term, traffic-related air pollution from increased project motor vehicle traffic are to improve roadways, reduce traffic or reduce individual vehicular emissions. In view of the predicted increase in air pollution levels near the intersection of Mohouli and Komohana Streets with the project, it may be appropriate to consider adding additional roadway improvements to the design of this intersection, if feasible.

Aside from further improving roadways, air pollution impacts from vehicular emissions could conceivably be mitigated by reducing traffic volumes through the promotion of bus service and car pooling and/or by adjusting local school and business hours to begin and end during off-peak times. However, this mitigation measure is generally considered only partially successful. Reduction of emissions from individual vehicles would have to be achieved through the promulgation of county, state or federal air pollution control regulations. For example, Hawaii currently does not require annual inspections of motor vehicle air pollution control equipment. At the present time, there is no indication that the state is contemplating adopting such rules.

Another potential mitigation measure would be to provide added buffer zones between walkways and roadways in areas where space is available. Technically, however, the public would have to somehow be excluded from the buffer zones. The predicted worst-case concentrations in this report are based on a separation distance of 3 m (10 ft) between walkways and roadways. Doubling this distance to about 6 m (20 ft) would in many cases reduce maximum concentrations by about 10 to 15 percent.

A further measure that could be used to reduce air pollution levels near intersections in the project vicinity would be to reduce speed limits, particularly on Komohana Street. Reducing speed limits would reduce acceleration emissions from traffic queues. This could be expected to reduce worst-case concentrations by about 25 to 35 percent.

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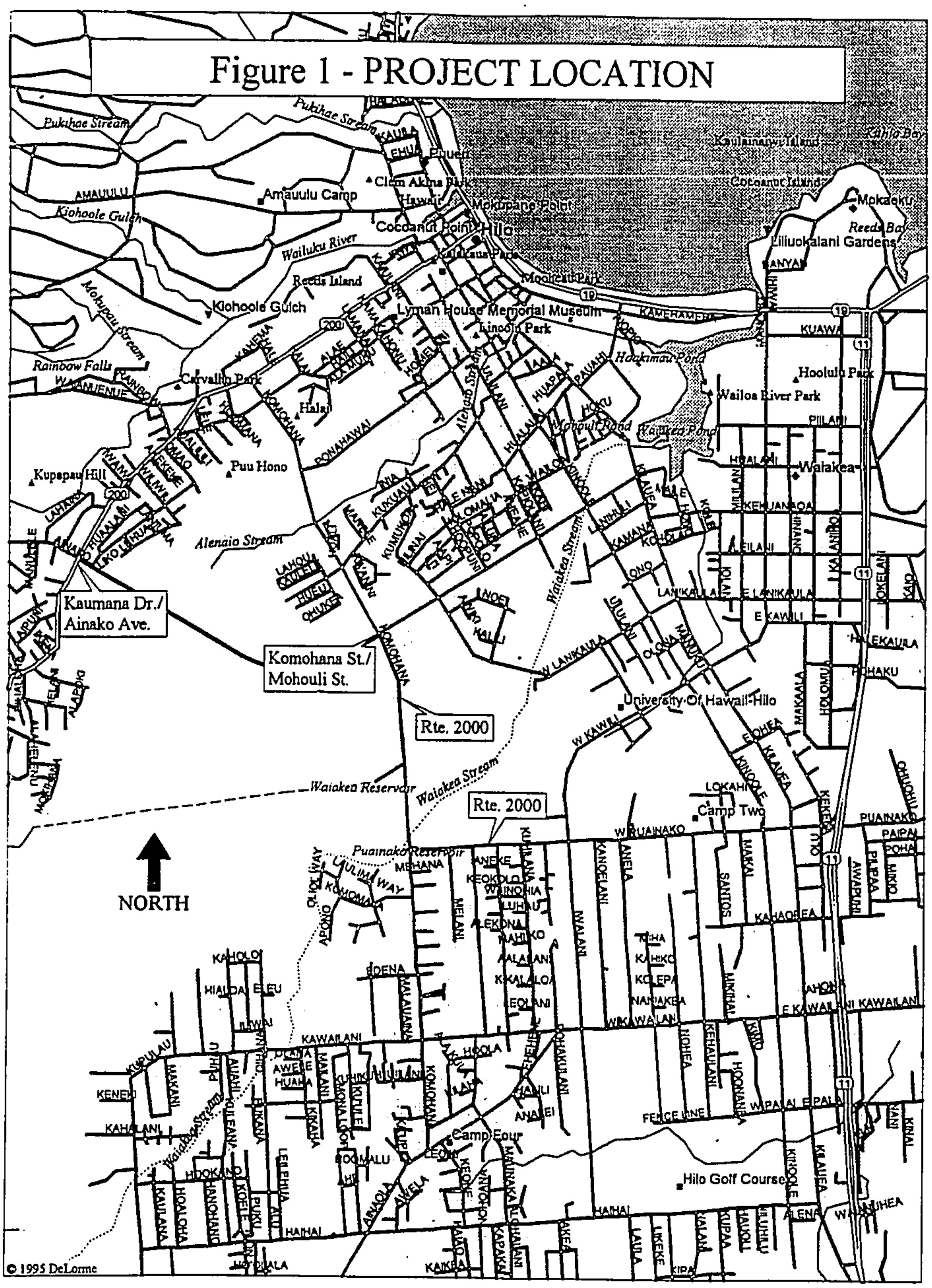

Figure 1 - PROJECT LOCATION

Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL
AMBIENT AIR QUALITY STANDARDS

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

[a]Particles less than or equal to 10 microns aerodynamic diameter

[b]Not to be exceeded more than once per year

Table 2

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR MOHOULI STREET EXTENSION PROJECT
(milligrams per cubic meter)

Roadway Intersection	Year/Scenario					
	1996/Present		2020/Without Project		2020/With Project	
	AM	PM	AM	PM	AM	PM
Kaumana Drive at Ainako Avenue	25.2	9.1	18.6	15.4	20.6	16.6
Mohouli Street at Komohana Street	29.3	25.0	30.0	20.7	35.8	28.3

Hawaii State AAQS: 10
National AAQS: 40

Table 3

ESTIMATED WORST CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR MOHOULI STREET EXTENSION PROJECT
(milligrams per cubic meter)

Roadway Intersection	Year/Scenario		
	1996/Present	2020/Without Project	2020/With Project
Kaumana Drive at Ainako Avenue	12.6	9.3	10.3
Mohouli Street at Komohana Street	14.7	15.0	17.9

Hawaii State AAQS: 5
National AAQS: 10

Appendix 3

ACOUSTIC STUDY
FOR
MOHOULI STREET EXTENSION

ACOUSTIC STUDY FOR THE MOHOULI STREET EXTENSION PROJECT KOMOHANA ST. TO AINAKO AVE. HILO, HAWAII

Prepared for:

Y.K. HAHN & ASSOCIATES

Prepared by:

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JULY 1996

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CHAPTER I. SUMMARY

The existing and future traffic noise along the corridor of the proposed Mohouli Street Extension Project from Komohana Street to the intersection of Ainako Avenue and Saddle Road (Kaumana Drive) in Hilo on the island of Hawaii were studied to evaluate potential noise impacts associated with the No Build and Build Alternatives. Noise measurements were obtained, traffic noise predictions developed, and noise abatement alternatives evaluated.

Existing traffic and background ambient noise levels along the Mohouli Street Extension corridor between Kaumana Drive and Komohana Street are relatively low. In these undeveloped areas, local or distant highway traffic, birds, dogs, or wind and foliage tend to be the dominant noise sources. Existing noise levels at these undeveloped areas are typically less than both FHWA exterior noise abatement criteria of 67 and 57 Leq(h).

The following general conclusions can be made in respect to the potential traffic noise impacts associated with the project:

A. Construction of the Mohouli Street Extension as planned should not result in traffic noise increases which exceed FHWA or Hawaii State DOT noise standards or noise abatement criteria. Therefore, traffic noise mitigation measures should not be required for the proposed project.

B. Under the No Build Alternative, the larger increases in traffic noise levels of 1.4 to 3.0 dB are expected to occur along Komohana Street and along the section of Ainako Avenue west of Kuamana Drive. Along Kuamana Drive, Mohouli Street, and Ainako Avenue east of Kuamana Drive, relatively small increases in traffic noise levels of 0.2 to 0.8 dB are expected under the No Build Alternative.

C. Under the Build Alternative, traffic noise increases are expected to be greater than under the No Build Alternative along the existing section of Mohouli Street east of Komohana Street and along Ainako Avenue on both sides of Kuamana Drive. Traffic noise levels are predicted to decrease along Kuamana Drive north of Ainako Avenue and along Komohana Street north of Mohouli Street under the Build Alternative. No significant changes in traffic noise levels under the Build Alternative are expected along Komohana Street south of Mohouli Street and along Kuamana Drive south of Ainako Avenue.

D. Under the Build Alternative, increases in existing background ambient noise levels are expected to be large (greater than 15 dB) along the high speed (50 mph) sections of the proposed Mohouli Street Extension. Fortunately, the lands adjoining the high speed sections of the proposed roadway are currently vacant, and the use of sound attenuation barriers and/or berms should not be required along the high speed sections of the proposed roadway.

E. Under the Build Alternative, relatively large increases in traffic noise levels are predicted to occur along the low speed (35 mph) sections of the Mohouli Street Extension in the vicinity of the Kukuau Street and Uluwai Street intersections. The magnitude of the increases, however, do not exceed current State DOT noise criteria.

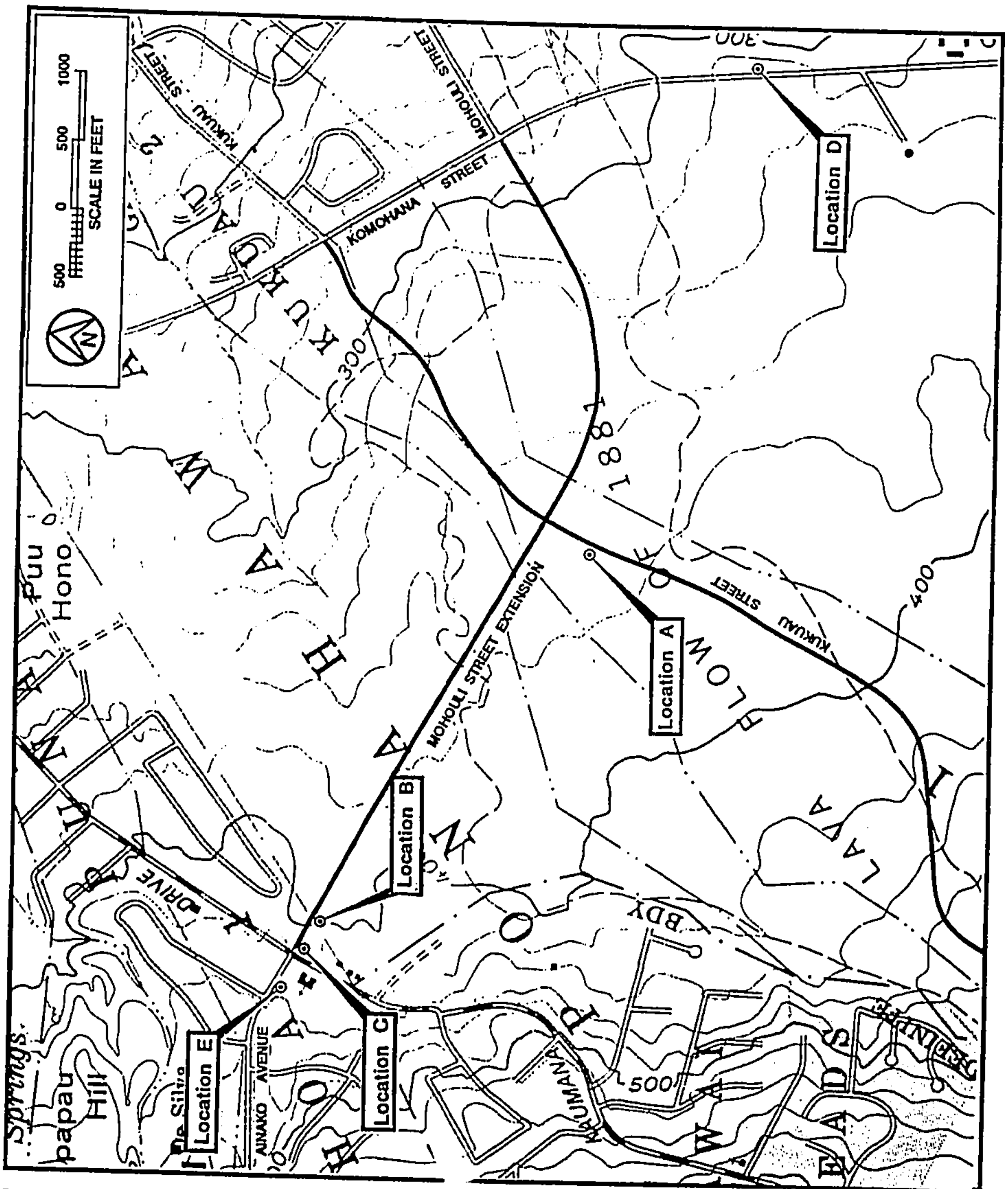
Unavoidable increases in background ambient noise levels at the quiet undeveloped areas along the roadway alignment are expected to occur following completion of the project. In essence, after the Mohouli Street Extension to Saddle Road is constructed, a redistribution of future traffic noise will occur from the existing lower sections of Saddle Road and Komohana Street to locations along the Mohouli Street Extension. This redistribution, however, will minimize future traffic noise impacts along the lower Saddle Road and Komohana Street corridors.

CHAPTER II. GENERAL STUDY METHODOLOGY

<u>Noise Measurements</u>. Existing traffic and background ambient noise levels at five locations in the project environs were measured in March and May 1996. The traffic noise measurements were used to calibrate the traffic noise model which was used to calculate the Base Year and future year traffic noise levels under the *No Build and Build Alternatives. The background ambient noise* measurements were used to define existing noise levels at noise sensitive receptors which may be affected by the project, and to determine if future traffic noise levels are predicted to "substantially exceed" existing background ambient noise levels at these noise sensitive receptors, and therefore exceed FHWA (U.S. Federal Highway Administration) and State DOT (Department of Transportation, Highways Division) standards.

The noise measurement locations are shown in **FIGURE 1.** The results of the traffic and background ambient noise measurements are summarized in **TABLES 1 and 2** and **FIGURES 2 thru 4.** In the tables and histograms, Leq represents the average (or equivalent), A-Weighted, sound level; L10 and L50 represent the sound levels exceeded 10 and 50 percent of the time, respectively; and Lmax and Lmin represent the maximum and minimum sound levels. A list and description of the acoustical terminology used is contained in **APPENDIX B.**

<u>Traffic Noise Predictions</u>. The Federal Highway Administration (FHWA) Traffic Noise Prediction Model (**Reference 1**) was used as the primary method of calculating Base Year and future traffic noise levels, with model parameters adjusted to reflect terrain, ground cover, and local shielding conditions. At the three traffic noise measurement locations along Ainako Avenue, Komohana Street, and Kaumana Drive, (Sites C thru E), the measured noise levels were compared with model predictions to insure that measured and calculated noise levels for the existing conditions were



LOCATIONS OF NOISE MEASUREMENT SITES

FIGURE 1

TABLE 1

TRAFFIC NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	--Hourly Traffic Volume-- AUTO	M. TRUCK	H. TRUCK	Measured Leq (dB)	Predicted Leq (dB)
C. 50FT from the center-line of Kaumana Dr. (3/25/96)	0756 TO 0817	45	637	6	6	63.6	63.5
C. 50FT from the center-line of Kaumana Dr. (5/14/96)	1615 TO 1715	45	977	6	4	64.6	64.5
D. 50FT from the center-line of Komohana St. (5/13/96)	1615 TO 1721	50	1207	11	4	67.3	67.1
E. 50FT from the center-line of Ainako Ave. (5/13/96)	0852 TO 0952	35	135	4	4	53.8	55.8
E. 50FT from the center-line of Ainako Ave. (5/15/96)	1615 TO 1715	35	286	3	2	56.1	56.0

TABLE 2

BACKGROUND AMBIENT NOISE MEASUREMENT RESULTS

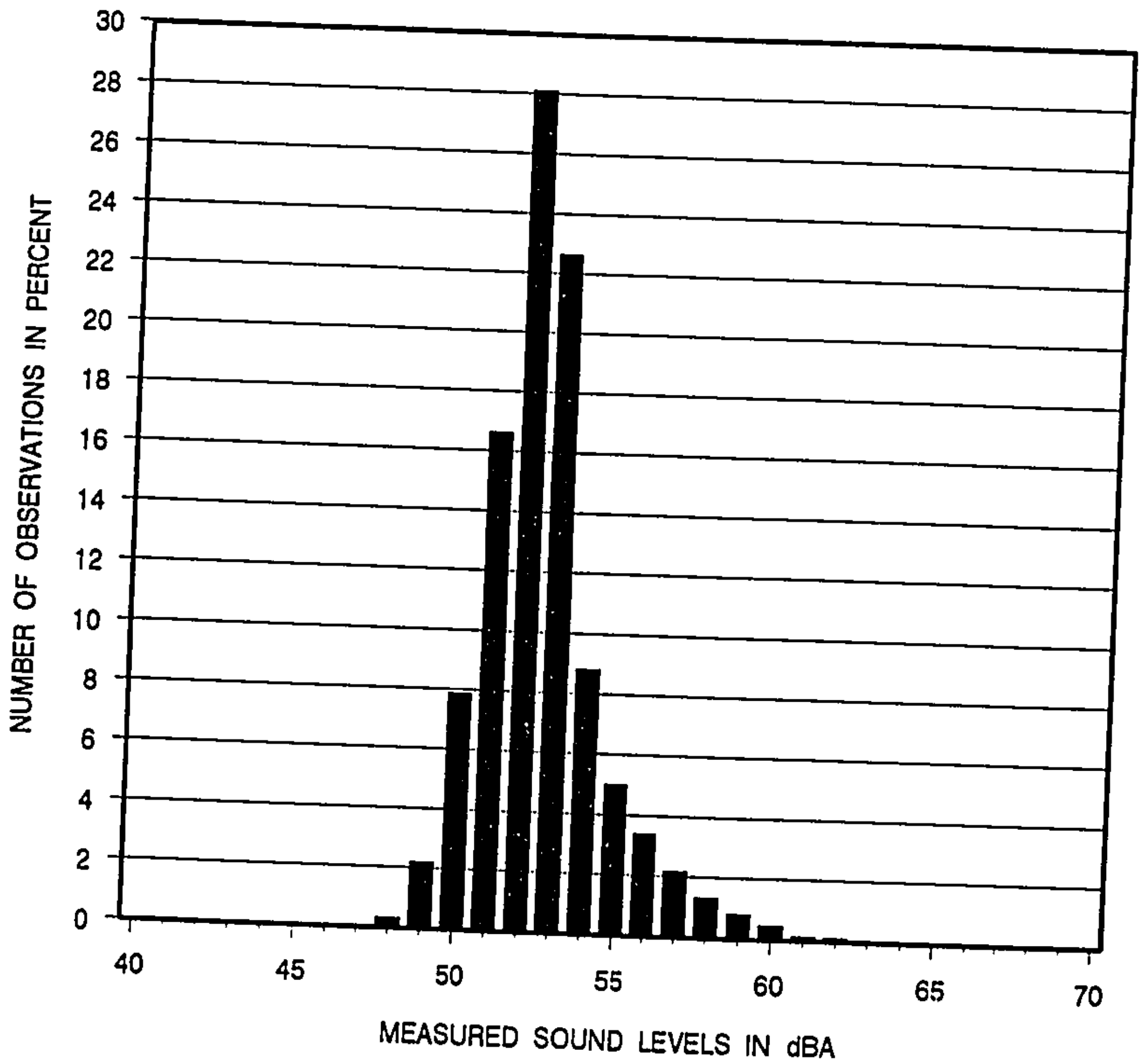
LOCATION	Time of Day (HRS)	Measured Lmax (dB)	Measured Leq (dB)	Measured Lmin (dB)
A. 42 FT from the centerline of Kukuau St. (3/25/96)	0640 TO 0700	71.4	49.9	35.5
B. Corner of Ainako Ave. and Uluwai St. (3/25/96)	0710 TO 0745	65.7	52.5	46.2

FIGURE 2

HISTOGRAM OF MEASURED SOUND LEVELS AT LOCATION "B"

DATE: MARCH 25, 1996
TIME: 0710–0745 HOURS

METER RESPONSE: FAST



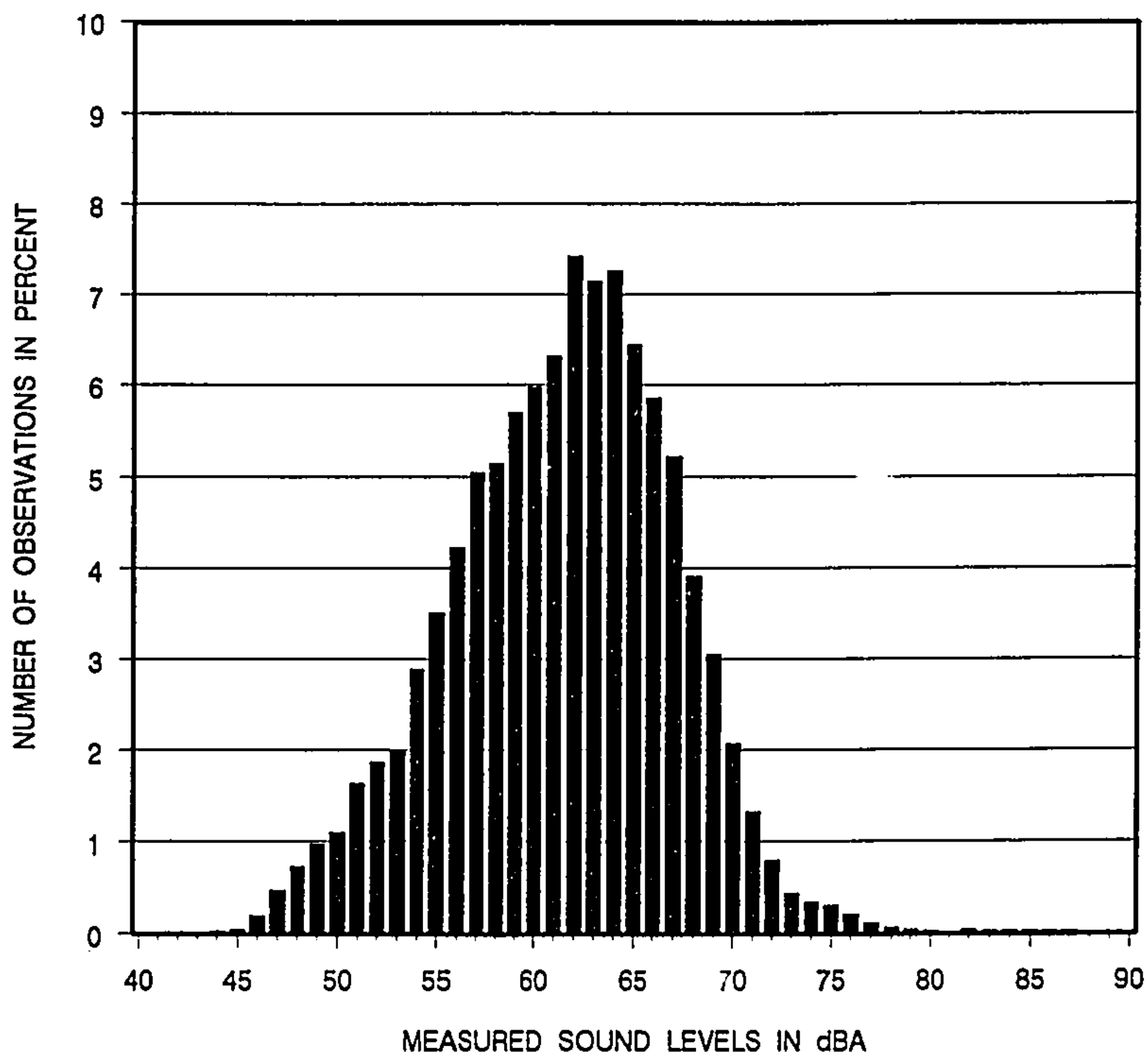
Lmax: 65.7 dBA
L10: 54.6 dBA
L50: 51.6 dBA
Leq: 52.5 dBA
Lmin: 46.2 dBA

FIGURE 3

HISTOGRAM OF MEASURED SOUND LEVELS AT LOCATION "C"

DATE: MAY 14, 1996
TIME: 1615–1715 HOURS

METER RESPONSE: FAST



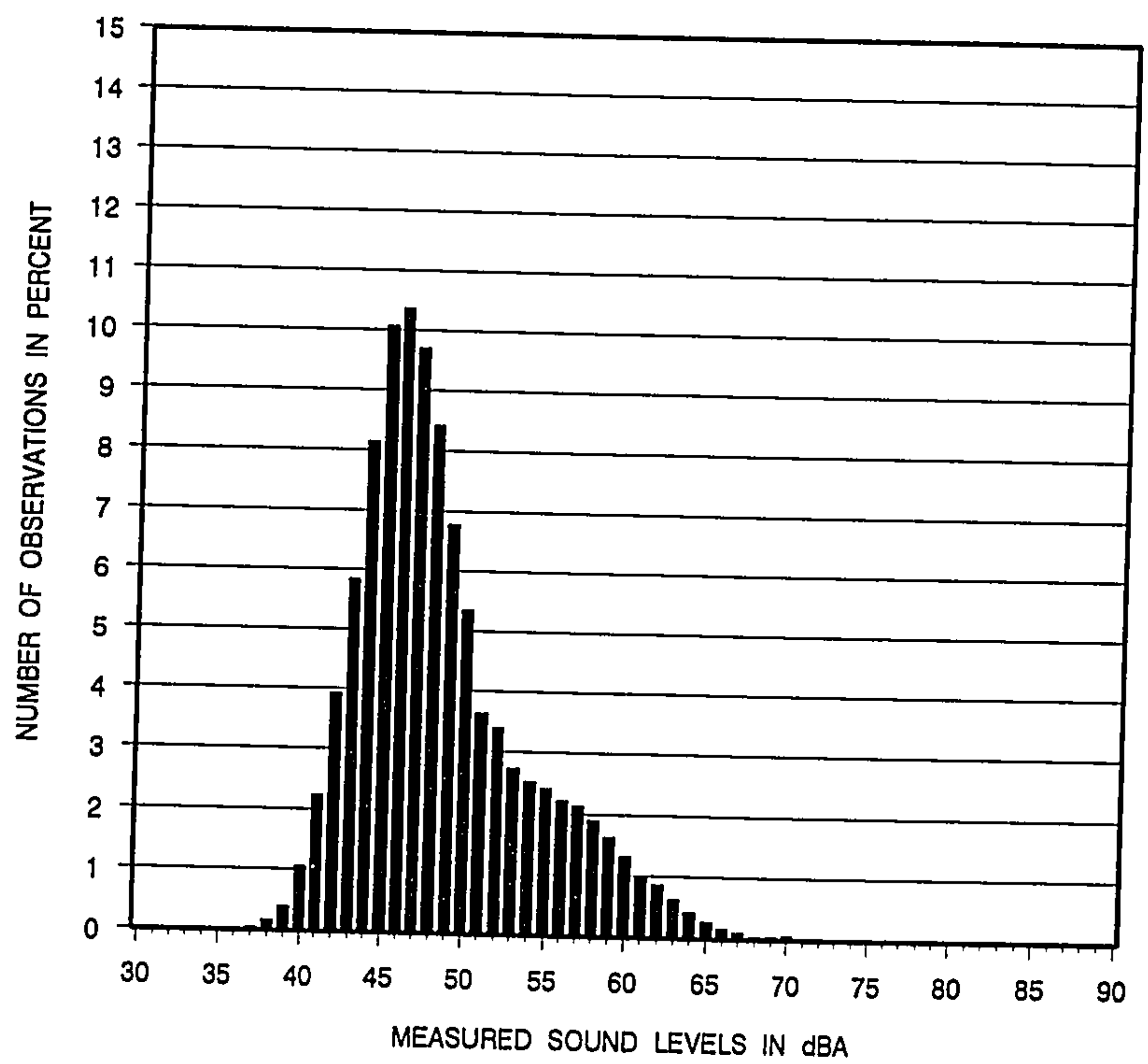
Lmax: 87.0 dBA
L10: 67.6 dBA
L50: 61.1 dBA
Leq: 64.6 dBA
Lmin: 43.1 dBA

FIGURE 4

HISTOGRAM OF MEASURED SOUND LEVELS AT LOCATION "E"

DATE: MAY 14, 1996
TIME: 0908–0953 HOURS

METER RESPONSE: FAST



Lmax:	70.1 dBA
L10:	56.1 dBA
L50:	46.6 dBA
Leq:	52.3 dBA
Lmin:	35.7 dBA

consistent and in general agreement. As indicated in **TABLE 1**, spot counts of traffic volumes were obtained during the measurement periods and were used to generate the Equivalent Sound Level (Leq) predictions shown in the table. The agreement between measured and predicted traffic noise levels was considered good, and sufficiently accurate to formulate the Base Year and future year traffic noise levels.

Base Year traffic noise levels were then calculated at feeder streets at both ends of the planned Mohouli Street Extension using Base Year (1996) traffic volume data for the AM and PM peak hours from **Reference 2**. Traffic mix by vehicle types and average vehicle speeds for the various sections of the existing and future roadway alignments were derived from observations during the noise monitoring periods and from **Reference 3**. The determination of the period of highest hourly traffic volumes along existing roadways and the future Mohouli Street Extension were made after a review of the Base Year AM and PM traffic volumes from **References 2 thru 5**. The Equivalent (or Average) Hourly Sound Level [Leq(h)] noise descriptor was used to calculate the Base Year and all future year traffic noise levels as required by **Reference 6**. Topographic maps and project plans (where available) of the area were used to determine terrain, ground cover, and local shielding effects from building structures, which were entered into the noise prediction model.

Future year (2020) traffic noise levels were then developed for the No Build and Build (Mohouli Street Extension) Alternatives using the future traffic assignments of **Reference 2**, the topographic and existing development features described previously, and the highway alignment and profile of the Extension Project. Preliminary roadway plans and cross-sections were available for this study.

The CY 2020 traffic assignments for the No Build Alternative reflected the forecasted demand traffic volumes along the existing roadways during the AM and PM peak hours. Future traffic conditions under the No Build Alternative may worsen if the capacity of the existing roadway system cannot accommodate the forecasted demand. Traffic assignments for the No Build Alternative under these constrained conditions were not available, but it was assumed that the excess volumes would tend to overflow into the hours adjacent to the historical peak hours. The resulting traffic noise levels during the AM and PM peak hours under the No Build Alternative were calculated for unconstrained conditions (i.e., average vehicle speeds similar to existing conditions), with the knowledge that these conditions may occur at hours other than the historical peak hours, and that they would tend to reflect a "worst case" rather than "average" prediction of noise levels along existing roadways under the No Build Alternative.

Impact Assessments and Mitigation. Following the calculation of the future traffic noise levels for the Build Alternative, comparisons of the future traffic noise levels and impacts between the No Build and Build Alternatives were made. Comparisons of predicted future traffic noise levels with FHWA noise abatement criteria (see **TABLE** 3) were also made to determine specific locations where noise abatement measures would be necessary. In addition, the State DOT's criteria of "greater than 15 dB increase above existing background noise levels" was also used as a noise abatement threshold for this project (from **Reference 7**). At the planned development areas which are currently vacant, the locations of the 57, 60, 65, 67, and 72 Leq(h) traffic noise contours, without the benefit of shielding from natural terrain or man-made sound barriers, were provided for siting future noise sensitive land uses along the new sections of the Mohouli Street Extension, and for defining the adequate buffer space between the roadway sections and these land uses. The FHWA 67 Leq(h) shown in **TABLE 3** and the State DOT "greater than 15 dB increase" criteria were applied to all dwellings along the proposed alignment of the Mohouli Street Extension. There are no churches, schools, or

TABLE 3

FHWA NOISE ABATEMENT CRITERIA
[Hourly A–Weighted Sound Level––Decibels (dBA)]

ACTIVITY CATEGORY	LEQ (H)	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extra–ordinary significance and serve an important public need and where the preservation of those qualities is essential if the areas are to continue to serve their intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, activity sports areas, parks, residences, motels, hotels, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	––––––	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

public parks along the project alignment. The use of noise barriers was considered as an option for mitigating adverse noise impacts where required.

CHAPTER III. EXISTING ACOUSTICAL ENVIRONMENT

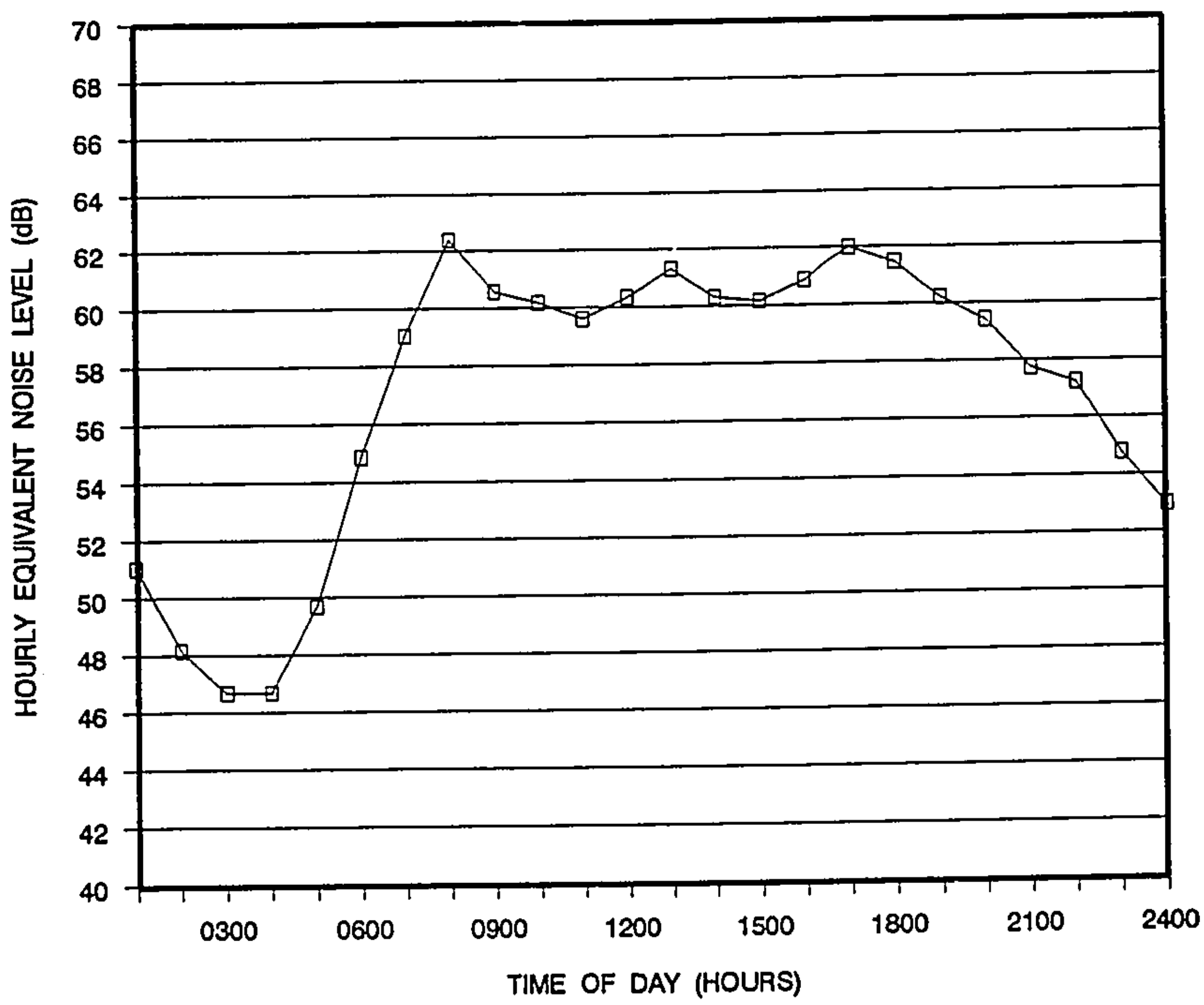
Along Existing Roadways in Project Environs. For the purposes of this study, 1996 was used as the Base Year for computing changes in traffic noise levels under the No Build and Build Alternatives. The Base Year noise environments along existing roadways in the project environs were described by computing the Hourly Equivalent Sound Levels [Leq(h)] along the existing roadways for the 1996 time period. These sound levels, expressed in decibels, represent the average level of traffic noise for a given hour of the day. Due to variations in existing traffic conditions along the roadways, evaluations of both the AM and PM peak hours were necessary to determine the hour with the highest traffic noise levels along each roadway. Typically, existing traffic noise levels are highest during the AM peak hour (see **FIGURES 5 and 6**).

TABLE 4 presents the traffic volume, speed, and mix assumptions used to calculate the Base Year noise levels along the various segments of the existing roadways. No existing traffic data was available along Kukuau Street. The roadway segment numbers and descriptions are shown in the table. Shown in **TABLE 4** are the calculated AM and PM Peak Hour Leq(h)'s at a reference distance of 100 FT from the centerline of the various roadway segments, and the calculated distances to the various noise contour lines (from 57 to 72 Leq) under unobstructed, line-of-sight conditions. The actual distances to the contour lines will generally be less than indicated in **TABLE 4** when intervening structures or walls exist between the highway and a receptor. This reduction (or shrinkage) of the traffic noise contour distances from the highway centerline are the result of noise shielding (or attenuation) affects caused by the intervening structures or walls.

By using the traffic assumptions of **TABLE 4**, the relationship of the existing free-field traffic noise contours to noise sensi-

FIGURE 5

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF KAUMANA DR. AT AINAKO AVE. (JUNE 27, 1994)



□ 100 FT from Roadway Centerline (61.8 Ldn)

FIGURE 6

HOURLY VARIATIONS OF TRAFFIC NOISE AT 100 FT SETBACK DISTANCE FROM THE CENTERLINE OF AINAKO AVE. AT KAUMANA DR.
(JUNE 27, 1994)

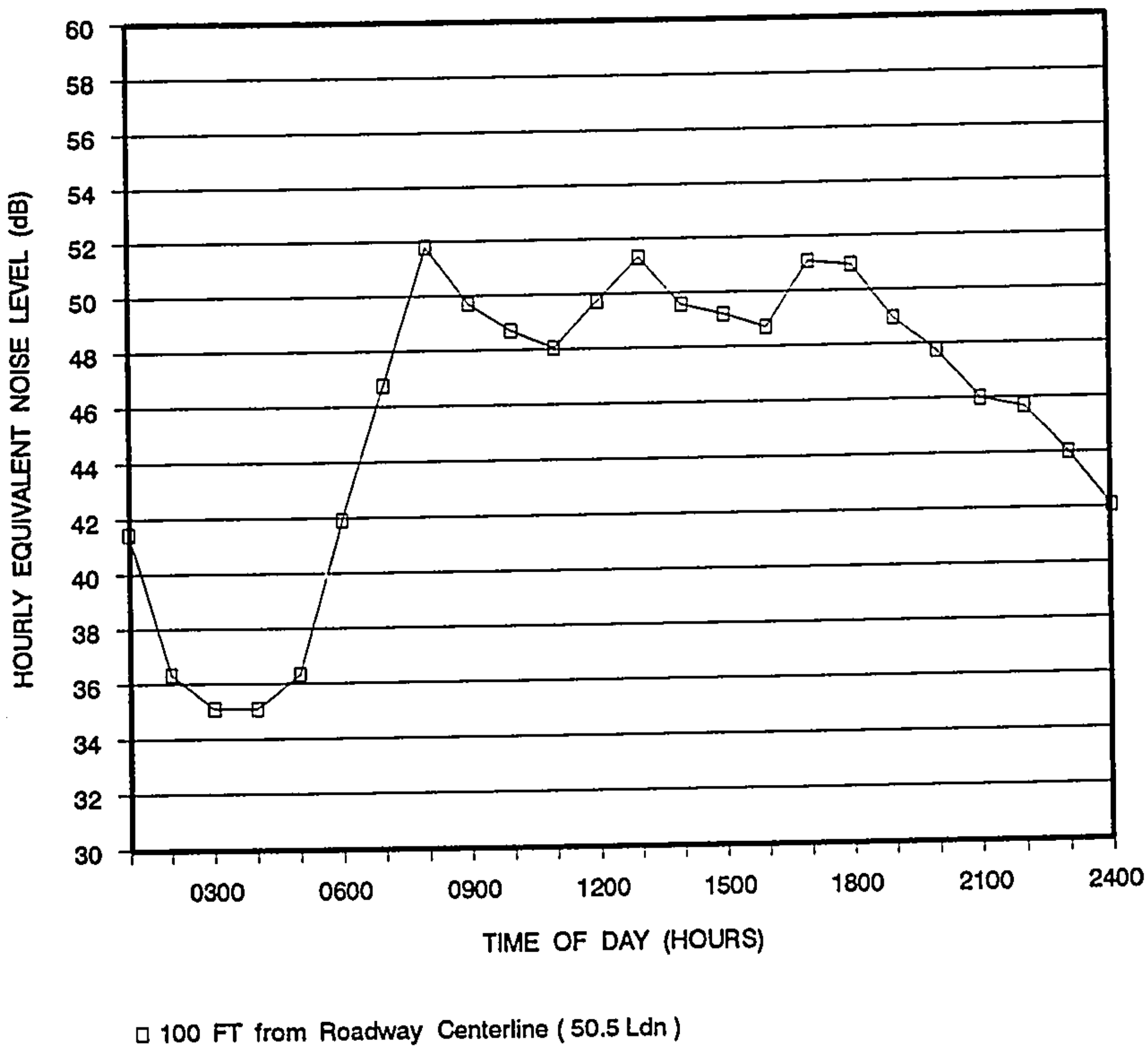


TABLE 4

EXISTING CONDITIONS; YEAR 1996; AM AND PM PEAK HOUR SETBACK DISTANCES

ROADWAY SEGMENT	SPEED	VEHICLE MIX (%A/%MT/%HT)	TOTAL VPH	Leq @ 100' dB	**** DISTANCE (FT) FROM CENTERLINE **** 57 Leq	60 Leq	65 Leq	67 Leq	72 Leq
AM Peak Hour:									
(1)	50 MPH	98.0/1.0/1.0	1,858	65.2	355	222	103	76	35
(2)	50 MPH	98.0/1.0/1.0	1,861	65.2	355	222	103	76	35
(3)	35 MPH	98.0/1.0/1.0	913	56.9	99	62	29	21	10
(4)	35 MPH	98.0/1.0/1.0	Unknown	N/A	N/A	N/A	N/A	N/A	N/A
(5)	35 MPH	98.0/1.0/1.0	Unknown	N/A	N/A	N/A	N/A	N/A	N/A
(6)	45 MPH	98.0/1.0/1.0	1,456	62.6	237	149	69	51	24
(7)	45 MPH	98.0/1.0/1.0	1,135	61.5	201	126	58	43	20
(8)	35 MPH	98.0/1.0/1.0	300	52.1	47	30	14	10	5
(9)	35 MPH	98.0/1.0/1.0	47	44.0	14	9	4	3	1
PM Peak Hour:									
(1)	50 MPH	98.0/1.0/1.0	1,557	64.5	315	200	93	68	32
(2)	50 MPH	98.0/1.0/1.0	1,294	63.7	279	176	82	60	28
(3)	35 MPH	98.0/1.0/1.0	771	56.2	88	56	26	19	9
(4)	35 MPH	98.0/1.0/1.0	Unknown	N/A	N/A	N/A	N/A	N/A	N/A
(5)	35 MPH	98.0/1.0/1.0	Unknown	N/A	N/A	N/A	N/A	N/A	N/A
(6)	45 MPH	98.0/1.0/1.0	1,388	62.4	229	145	67	49	23
(7)	45 MPH	98.0/1.0/1.0	1,131	61.5	200	126	58	43	20
(8)	35 MPH	98.0/1.0/1.0	258	51.4	42	27	12	9	4
(9)	35 MPH	98.0/1.0/1.0	47	44.0	14	9	4	3	1

ROADWAY SEGMENT	BOUNDING INTERSECTIONS
(1)	Komohana St., (North of Mohouli St.)
(2)	Komohana St., (South of Mohouli St.)
(3)	Mohouli St., (East of Komohana St.)
(4)	Kukuau St., (North of Proposed Mohouli St. Extension)
(5)	Kukuau St., (South of Proposed Mohouli St. Extension)
(6)	Kaumana Dr., (North of Ainako Ave.)
(7)	Kaumana Dr., (South of Ainako Ave.)
(8)	Ainako Ave., (West of Kaumana Dr.)
(9)	Ainako Ave., (Kaumana Dr. to Uluwai St.)

tive properties along the existing roadways can be determined. Along Komohana Street, a minimum setback distance of 76 feet from the roadway centerline is required to not exceed the FHWA 67 Leq standard. Along Mohouli Street, Kaumana Drive, and Ainako Avenue, the required minimum setback distance is 51 feet or less.

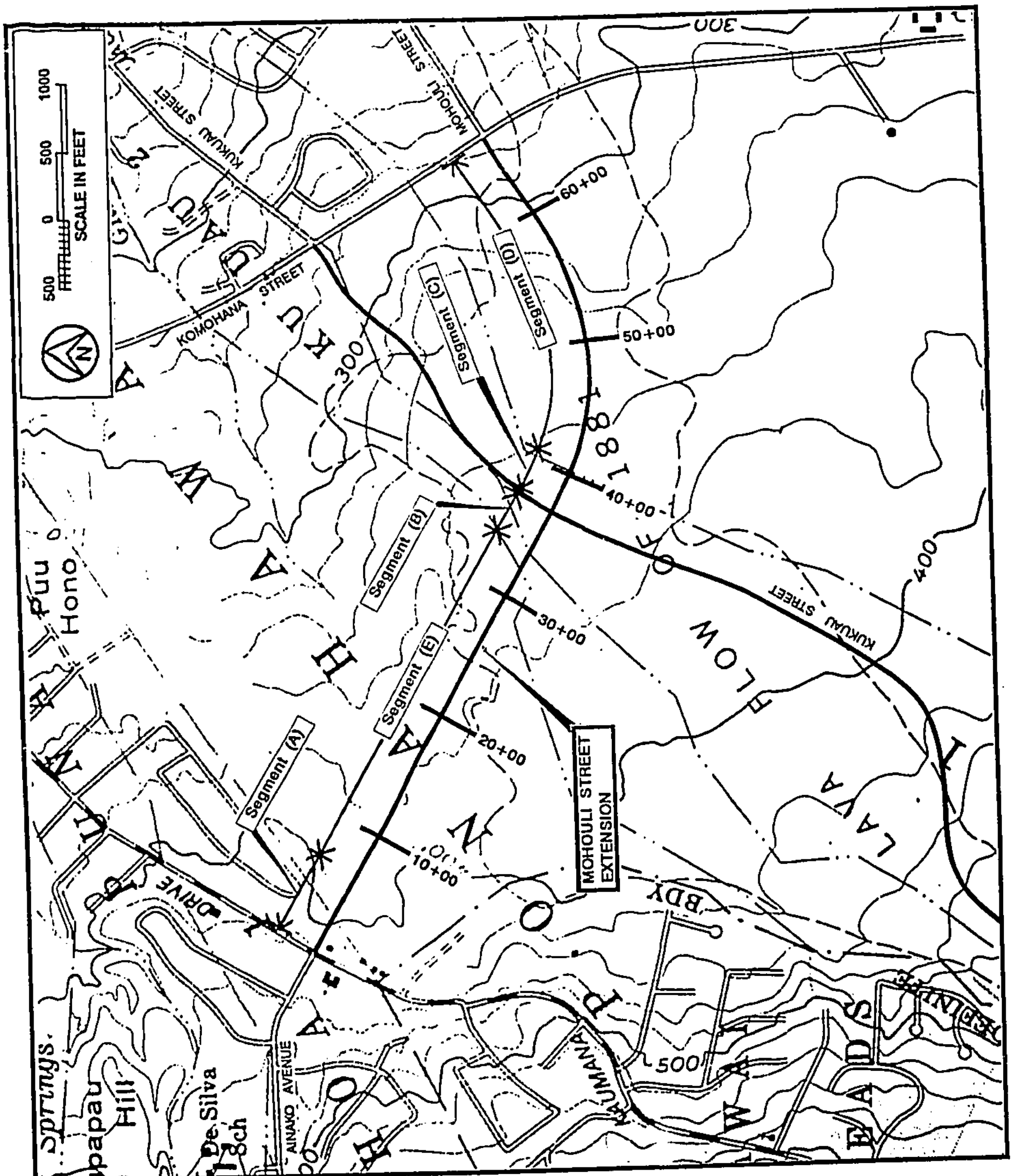
Along Mohouli Street Extension Alignment. Along the project corridor, no noise sensitive properties currently experience exterior noise levels above the FHWA noise abatement criteria of 67 Leq during the AM or PM peak hours. No dwelling units, churches, schools, or parks within the project corridor currently experience traffic noise levels greater than 67 Leq during the AM or PM peak hour as a result of existing noise levels along the future roadway alignment. At these vacant areas along the Mohouli Street Extension Alignment, Base Year noise levels are very low. As the background ambient noise measurement results of **TABLE 2** and **FIGURE 2** indicate, Base Year noise levels in areas along the project corridor are typically less than 57 Leq(h), and possibly as low as 45 Leq(h). In these less populated areas, local or distant roadway traffic, birds, dogs, or wind and foliage tend to be the dominant noise sources. Existing noise levels at these inland areas are typically less than both FHWA exterior noise abatement criteria of 67 and 57 Leq(h). Therefore, at least 10 dB of noise attenuation measures may be required below the 67 Leq(h) criteria of **TABLE 3** in order to minimize potential noise impacts which could result from a substantial increase in background ambient noise levels caused by the proposed alignment of the Mohouli Street Extension. In these situations, the State DOT's interim policy (to provide noise mitigation measures where project traffic noise is expected to exceed existing background ambient noise levels by more than 15 dB) was applied to minimize potential noise impacts at noise sensitive receptor locations.

CHAPTER IV. COMPARISONS OF FUTURE TRAFFIC NOISE LEVELS UNDER THE NO BUILD AND BUILD ALTERNATIVES

The future traffic noise levels along the proposed roadway extension alignment during CY 2020 were evaluated for the No Build Build Alternatives. The locations of the various Mohouli Street Extension segments and their alignments in relationship to the existing roadways are shown in **FIGURE 7**. The same methodology that was used to calculate the Base Year noise levels was also used to calculate the Year 2020 noise levels under the No Build and Build Alternatives.

TABLES 5 and 6 present comparisons of the predicted changes in traffic noise levels at the east (Komohana Street) and west (Saddle Road) ends of the project corridor, as well as along various roadway segments along the Mohouli Street Extension alignment under the No Build and Build Alternatives. Shown in the tables are the predicted traffic noise levels along the existing feeder roads at both ends of the extension alignment. **TABLES 7A and 7B** present comparisons of the corresponding changes in the setback distances to the 57 thru 72 Leq(h) noise contours at the east and west ends of the project corridor under the No Build and Build Alternatives. **TABLES 5 thru 7B** are useful for presenting an overview of the changes in future traffic noise levels that can be expected at the east and west ends of Mohouli Street Extension Project as well as along the project corridor.

The future (CY 2020) traffic volume, speed, and mix assumptions used for the No Build and Build Alternatives are shown in **TABLES 8A and 8B**, respectively. The existing roadway segment designations of **TABLES 8A and 8B** are identical to those listed in **TABLE 4**. Also shown in **TABLES 8A and 8B** are the future traffic noise levels at a reference distance of 100 FT from the roadways' centerlines, the changes in traffic noise levels from the Base Year (CY 1996) values along each roadway segment, and the future setback distances to the 57 thru 72 Leq(h) noise contours under



LOCATION OF PROPOSED MOHOULI STREET EXTENSION PROJECT ALIGNMENT

FIGURE 7

TABLE 5

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS
IN THE PROJECT ENVIRONS (AM PEAK HOUR)

LOCATION	SPEED (MPH)	VPH	** HOURLY Leq IN dB @ 100' ** AUTO	MT	HT	ALL VEH	DB INCREASE
YEAR 1996 AM PEAK HOUR TRAFFIC (Existing Condition):							
Komohana St., (North of Mohouli St.)	50	1,858	63.5	54.6	59.0	65.2	-
Komohana St., (South of Mohouli St.)	50	1,861	63.5	54.6	59.0	65.2	-
Mohouli St., (East of Komohana St.)	35	913	54.6	46.3	52.1	56.9	-
Kukuau St., (North of Proposed Mohouli St.)	35	Unknown	N/A	N/A	N/A	N/A	-
Kukuau St., (South of Proposed Mohouli St.)	35	Unknown	N/A	N/A	N/A	N/A	-
Kaumana Dr., (North of Ainako Ave.)	45	1,456	60.7	52.0	56.8	62.6	-
Kaumana Dr., (South of Ainako Ave.)	45	1,135	59.7	50.9	55.7	61.5	-
Ainako Ave., (West of Kaumana Dr.)	35	300	49.7	41.4	47.3	52.1	-
Ainako Ave., (Kaumana Dr. to Uluwai St.)	35	47	41.7	33.4	39.2	44.0	-
YEAR 2020 AM PEAK HOUR TRAFFIC (Base Condition, No Build Alternative):							
Komohana St., (North of Mohouli St.)	50	2,790	65.3	56.4	60.8	67.0	1.8
Komohana St., (South of Mohouli St.)	50	2,536	64.9	56.0	60.3	66.6	1.4
Mohouli St., (East of Komohana St.)	35	1,108	55.4	47.1	52.9	57.7	0.8
Kukuau St., (North of Proposed Mohouli St.)	35	124	45.9	37.6	43.4	48.2	N/A
Kukuau St., (South of Proposed Mohouli St.)	35	124	45.9	37.6	43.4	48.2	N/A
Kaumana Dr., (North of Ainako Ave.)	45	1,657	61.3	52.6	57.4	63.2	0.6
Kaumana Dr., (South of Ainako Ave.)	45	1,180	59.8	51.1	55.9	61.7	0.2
Ainako Ave., (West of Kaumana Dr.)	35	586	52.6	44.4	50.2	55.0	2.9
Ainako Ave., (Kaumana Dr. to Uluwai St.)	35	49	41.9	33.6	39.4	44.2	0.2
YEAR 2020 AM PEAK HOUR TRAFFIC (Future Condition with Project):							
Komohana St., (North of Mohouli St.)	50	1,804	63.4	54.5	58.9	65.1	-0.1
Komohana St., (South of Mohouli St.)	50	2,631	65.1	56.1	60.5	66.8	1.5
Mohouli St., (East of Komohana St.)	35	1,574	56.9	48.6	54.5	59.3	2.4
Kukuau St., (North of Mohouli St.)	35	15	36.7	28.4	34.3	39.1	N/A
Kukuau St., (South of Mohouli St.)	35	124	45.9	37.6	43.4	48.2	N/A
Kaumana Dr., (North of Ainako Ave.)	45	729	57.7	49.0	53.8	59.6	-3.0
Kaumana Dr., (South of Ainako Ave.)	45	1,126	59.6	50.9	55.7	61.5	0.0
Ainako Ave., (West of Kaumana Dr.)	35	780	53.9	45.6	51.4	56.2	4.1
Mohouli St. Extension, (Segment A)	35	1,389	56.4	48.1	53.9	58.7	14.7
Mohouli St. Extension, (Segment B)	35	1,366	56.3	48.0	53.8	58.7	-
Mohouli St. Extension, (Segment C)	35	1,509	56.8	48.5	54.3	59.1	-
Mohouli St. Extension, (Segment D)	50	1,509	62.6	53.7	58.1	64.3	-
Mohouli St. Extension, (Segment E)	50	1,366	62.2	53.3	57.7	63.9	-

Notes:

1. Segment (A) is from Kaumana Dr. to Uluwai St.
2. Segment (B) is 35 MPH section of new roadway west of Kukuau St. intersection.
3. Segment (C) is 35 MPH section of new roadway east of Kukuau St. intersection.
4. Segment (D) is high speed section of new roadway between Kukuau St. and Komohana St.
5. Segment (E) is high speed section of new roadway between Uluwai St. and Kukuau St.

TABLE 6

COMPARISONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS IN THE PROJECT ENVIRONS (PM PEAK HOUR)

LOCATION	SPEED (MPH)	VPH	** HOURLY Leq IN dB @ 100' ** AUTO	MT	HT	ALL VEH	DB INCREASE
YEAR 1996 PM PEAK HOUR TRAFFIC (Existing Condition):							
Komohana St., (North of Mohouli St.)	50	1,557	62.8	53.8	58.2	64.5	-
Komohana St., (South of Mohouli St.)	50	1,294	62.0	53.0	57.4	63.7	-
Mohouli St., (East of Komohana St.)	35	771	53.8	45.5	51.4	56.2	-
Kukuau St., (North of Proposed Mohouli St.)	35	Unknown	N/A	N/A	N/A	N/A	-
Kukuau St., (South of Proposed Mohouli St.)	35	Unknown	N/A	N/A	N/A	N/A	-
Kaumana Dr., (North of Ainako Ave.)	45	1,388	60.5	51.8	56.6	62.4	-
Kaumana Dr., (South of Ainako Ave.)	45	1,131	59.6	50.9	55.7	61.5	-
Ainako Ave., (West of Kaumana Dr.)	35	258	49.1	40.8	46.6	51.4	-
Ainako Ave., (Kaumana Dr. to Uluwai St.)	35	47	41.7	33.4	39.2	44.0	-
YEAR 2020 PM PEAK HOUR TRAFFIC (Base Condition, No Build Alternative):							
Komohana St., (North of Mohouli St.)	50	2,309	64.5	55.6	59.9	66.2	1.7
Komohana St., (South of Mohouli St.)	50	2,181	64.2	55.3	59.7	65.9	2.3
Mohouli St., (East of Komohana St.)	35	900	54.5	46.2	52.0	56.8	0.7
Kukuau St., (North of Proposed Mohouli St.)	35	169	47.2	39.0	44.8	49.6	N/A
Kukuau St., (South of Proposed Mohouli St.)	35	169	47.2	39.0	44.8	49.6	N/A
Kaumana Dr., (North of Ainako Ave.)	45	1,545	61.0	52.3	57.1	62.9	0.5
Kaumana Dr., (South of Ainako Ave.)	45	1,201	59.9	51.2	56.0	61.8	0.3
Ainako Ave., (West of Kaumana Dr.)	35	513	52.1	43.8	49.6	54.4	3.0
Ainako Ave., (Kaumana Dr. to Uluwai St.)	35	51	42.0	33.8	39.6	44.4	0.4
YEAR 2020 PM PEAK HOUR TRAFFIC (Future Condition with Project):							
Komohana St., (North of Mohouli St.)	50	1,497	62.6	53.7	58.1	64.3	−0.2
Komohana St., (South of Mohouli St.)	50	2,246	64.4	55.4	59.8	66.1	2.4
Mohouli St., (East of Komohana St.)	35	1,289	56.1	47.8	53.6	58.4	2.2
Kukuau St., (North of Mohouli St.)	35	19	37.8	29.5	35.3	40.1	N/A
Kukuau St., (South of Mohouli St.)	35	169	47.2	39.0	44.8	49.6	N/A
Kaumana Dr., (North of Ainako Ave.)	45	551	56.5	47.8	52.6	58.4	−4.0
Kaumana Dr., (South of Ainako Ave.)	45	1,230	60.0	51.3	56.1	61.9	0.4
Ainako Ave., (West of Kaumana Dr.)	35	781	53.9	45.6	51.4	56.2	4.8
Mohouli St. Extension, (Segment A)	35	1,432	56.5	48.2	54.1	58.9	14.8
Mohouli St. Extension, (Segment B)	35	1,380	56.4	48.1	53.9	58.7	-
Mohouli St. Extension, (Segment C)	35	1,270	56.0	47.7	53.5	58.3	-
Mohouli St. Extension, (Segment D)	50	1,270	61.9	53.0	57.3	63.6	-
Mohouli St. Extension, (Segment E)	50	1,380	62.2	53.3	57.7	63.9	-

Notes:

1. Segment (A) is from Kaumana Dr. to Uluwai St.
2. Segment (B) is 35 MPH section of new roadway west of Kukuau St. intersection.
3. Segment (C) is 35 MPH section of new roadway east of Kukuau St. intersection.
4. Segment (D) is high speed section of new roadway between Kukuau St. and Komohana St.
5. Segment (E) is high speed section of new roadway between Uluwai St. and Kukuau St.

TABLE 7A

EXISTING AND FUTURE DISTANCES TO 57, 67, AND 72 Leq CONTOURS (AM PEAK HR.)

LOCATION	57 Leq SETBACK (FT) EXISTING	57 Leq SETBACK (FT) CY 2020	67 Leq SETBACK (FT) EXISTING	67 Leq SETBACK (FT) CY 2020	72 Leq SETBACK (FT) EXISTING	72 Leq SETBACK (FT) CY 2020
YEAR 1996 AM PEAK HOUR TRAFFIC (Existing Condition):						
Komohana St., (North of Mohouli St.)	355	N/A	76	N/A	35	N/A
Komohana St., (South of Mohouli St.)	355	N/A	76	N/A	35	N/A
Mohouli St., (East of Komohana St.)	99	N/A	21	N/A	10	N/A
Kukuau St., (North of Proposed Mohouli St.)	Unknown	N/A	Unknown	N/A	Unknown	N/A
Kukuau St., (South of Proposed Mohouli St.)	Unknown	N/A	Unknown	N/A	Unknown	N/A
Kaumana Dr., (North of Ainako Ave.)	237	N/A	51	N/A	24	N/A
Kaumana Dr., (South of Ainako Ave.)	201	N/A	43	N/A	20	N/A
Ainako Ave., (West of Kaumana Dr.)	47	N/A	10	N/A	5	N/A
Ainako Ave., (Kaumana Dr. to Uluwai St.)	14	N/A	3	N/A	1	N/A
YEAR 2020 AM PEAK HOUR TRAFFIC (Base Condition, No Build Alternative):						
Komohana St., (North of Mohouli St.)	355	464	76	100	35	46
Komohana St., (South of Mohouli St.)	355	436	76	94	35	44
Mohouli St., (East of Komohana St.)	99	112	21	24	10	11
Kukuau St., (North of Proposed Mohouli St.)	Unknown	26	Unknown	6	Unknown	3
Kukuau St., (South of Proposed Mohouli St.)	Unknown	26	Unknown	6	Unknown	3
Kaumana Dr., (North of Ainako Ave.)	237	258	51	56	24	26
Kaumana Dr., (South of Ainako Ave.)	201	206	43	44	20	21
Ainako Ave., (West of Kaumana Dr.)	47	73	10	16	5	7
Ainako Ave., (Kaumana Dr. to Uluwai St.)	14	14	3	3	1	1

Notes:

1. All setback distances are from the roadways' centerlines.
2. Setback distances are for unobstructed line-of-sight conditions.

TABLE 7A (CONTINUED)

EXISTING AND FUTURE DISTANCES TO 57, 67, AND 72 Leq CONTOURS (AM PEAK HR.)

LOCATION	57 Leq SETBACK (FT) EXISTING	57 Leq SETBACK (FT) CY 2020	67 Leq SETBACK (FT) EXISTING	67 Leq SETBACK (FT) CY 2020	72 Leq SETBACK (FT) EXISTING	72 Leq SETBACK (FT) CY 2020
YEAR 2020 AM PEAK HOUR TRAFFIC (Future Condition with Project):						
Komohana St., (North of Mohouli St.)	355	348	76	75	35	35
Komohana St., (South of Mohouli St.)	355	447	76	96	35	45
Mohouli St., (East of Komohana St.)	99	142	21	31	10	14
Kukuau St., (North of Mohouli St.)	Unknown	6	Unknown	1	Unknown	1
Kukuau St., (South of Mohouli St.)	Unknown	26	Unknown	6	Unknown	3
Kaumana Dr., (North of Ainako Ave.)	237	149	51	32	24	15
Kaumana Dr., (South of Ainako Ave.)	201	199	43	43	20	20
Ainako Ave., (West of Kaumana Dr.)	47	89	10	19	5	9
Mohouli St. Extension, (Segment A)	14	131	3	28	1	13
Mohouli St. Extension, (Segment B)	N/A	129	N/A	28	N/A	13
Mohouli St. Extension, (Segment C)	N/A	138	N/A	30	N/A	14
Mohouli St. Extension, (Segment D)	N/A	308	N/A	66	N/A	31
Mohouli St. Extension, (Segment E)	N/A	289	N/A	62	N/A	29

Notes:

1. All setback distances are from the roadways' centerlines.
2. Setback distances are for unobstructed line–of–sight conditions.
3. Segment (A) is from Kaumana Dr. to Uluwai St.
4. Segment (B) is 35 MPH section of new roadway west of Kukuau St. intersection.
5. Segment (C) is 35 MPH section of new roadway east of Kukuau St. intersection.
6. Segment (D) is high speed section of new roadway between Kukuau St. and Komohana St.
7. Segment (E) is high speed section of new roadway between Uluwai St. and Kukuau St.

TABLE 7B

EXISTING AND FUTURE DISTANCES TO 57, 67, AND 72 Leq CONTOURS (PM PEAK HR.)

LOCATION	57 Leq SETBACK (FT)		67 Leq SETBACK (FT)		72 Leq SETBACK (FT)	
	EXISTING	CY 2020	EXISTING	CY 2020	EXISTING	CY 2020
YEAR 1996 PM PEAK HOUR TRAFFIC (Existing Condition):						
Komohana St., (North of Mohouli St.)	315	N/A	68	N/A	31	N/A
Komohana St., (South of Mohouli St.)	279	N/A	60	N/A	28	N/A
Mohouli St., (East of Komohana St.)	88	N/A	19	N/A	9	N/A
Kukuau St., (North of Proposed Mohouli St.)	Unknown	N/A	Unknown	N/A	Unknown	N/A
Kukuau St., (South of Proposed Mohouli St.)	Unknown	N/A	Unknown	N/A	Unknown	N/A
Kaumana Dr., (North of Ainako Ave.)	229	N/A	49	N/A	23	N/A
Kaumana Dr., (South of Ainako Ave.)	200	N/A	43	N/A	20	N/A
Ainako Ave., (West of Kaumana Dr.)	42	N/A	9	N/A	4	N/A
Ainako Ave., (Kaumana Dr. to Uluwai St.)	14	N/A	3	N/A	1	N/A
YEAR 2020 PM PEAK HOUR TRAFFIC (Base Condition, No Build Alternative):						
Komohana St., (North of Mohouli St.)	315	410	68	88	31	41
Komohana St., (South of Mohouli St.)	279	394	60	85	28	39
Mohouli St., (East of Komohana St.)	88	98	19	21	9	10
Kukuau St., (North of Proposed Mohouli St.)	Unknown	32	Unknown	7	Unknown	3
Kukuau St., (South of Proposed Mohouli St.)	Unknown	32	Unknown	7	Unknown	3
Kaumana Dr., (North of Ainako Ave.)	229	246	49	53	23	25
Kaumana Dr., (South of Ainako Ave.)	200	208	43	45	20	21
Ainako Ave., (West of Kaumana Dr.)	42	67	9	14	4	7
Ainako Ave., (Kaumana Dr. to Uluwai St.)	14	14	3	3	1	1

Notes:

1. All setback distances are from the roadways' centerlines.
2. Setback distances are for unobstructed line–of–sight conditions.

TABLE 7B (CONTINUED)

EXISTING AND FUTURE DISTANCES TO 57, 67, AND 72 Leq CONTOURS (PM PEAK HR.)

LOCATION	57 Leq SETBACK (FT) EXISTING	57 Leq SETBACK (FT) CY 2020	67 Leq SETBACK (FT) EXISTING	67 Leq SETBACK (FT) CY 2020	72 Leq SETBACK (FT) EXISTING	72 Leq SETBACK (FT) CY 2020
YEAR 2020 PM PEAK HOUR TRAFFIC (Future Condition with Project):						
Komohana St., (North of Mohouli St.)	315	307	68	66	31	31
Komohana St., (South of Mohouli St.)	279	402	60	87	28	40
Mohouli St., (East of Komohana St.)	88	124	19	27	9	12
Kukuau St., (North of Mohouli St.)	Unknown	7	Unknown	2	Unknown	1
Kukuau St., (South of Mohouli St.)	Unknown	32	Unknown	7	Unknown	3
Kaumana Dr., (North of Ainako Ave.)	229	124	49	27	23	12
Kaumana Dr., (South of Ainako Ave.)	200	212	43	46	20	21
Ainako Ave., (West of Kaumana Dr.)	42	89	9	19	4	9
Mohouli St. Extension, (Segment A)	14	133	3	29	1	13
Mohouli St. Extension, (Segment B)	N/A	130	N/A	28	N/A	13
Mohouli St. Extension, (Segment C)	N/A	123	N/A	26	N/A	12
Mohouli St. Extension, (Segment D)	N/A	275	N/A	59	N/A	27
Mohouli St. Extension, (Segment E)	N/A	290	N/A	63	N/A	29

Notes:

1. All setback distances are from the roadways' centerlines.
2. Setback distances are for unobstructed line–of–sight conditions.
3. Segment (A) is from Kaumana Dr. to Uluwai St.
4. Segment (B) is 35 MPH section of new roadway west of Kukuau St. intersection.
5. Segment (C) is 35 MPH section of new roadway east of Kukuau St. intersection.
6. Segment (D) is high speed section of new roadway between Kukuau St. and Komohana St.
7. Segment (E) is high speed section of new roadway between Uluwai St. and Kukuau St.

TABLE 8A

NO BUILD; BASE CONDITION; YEAR 2020; AM AND PM PEAK HR. SETBACK DISTANCES

ROADWAY SEGMENT	SPEED	VEHICLE MIX (%A/%MT/%HT)	TOTAL VPH	Leq @ 100' dB	CHANGE	**** DISTANCE (FT) FROM CENTERLINE **** 57 Leq	60 Leq	65 Leq	67 Leq	72 Leq ****
AM Peak Hour:										
(1)	50 MPH	98.0/1.0/1.0	2,790	67.0	1.8	464	293	136	100	46
(2)	50 MPH	98.0/1.0/1.0	2,536	66.6	1.4	436	275	128	94	44
(3)	35 MPH	98.0/1.0/1.0	1,108	57.7	0.8	112	71	33	24	11
(4)	35 MPH	98.0/1.0/1.0	124	48.2	N/A	26	16	8	6	3
(5)	35 MPH	98.0/1.0/1.0	124	48.2	N/A	26	16	8	6	3
(6)	45 MPH	98.0/1.0/1.0	1,657	63.2	0.6	258	163	76	56	26
(7)	45 MPH	98.0/1.0/1.0	1,180	61.7	0.2	206	130	60	44	21
(8)	35 MPH	98.0/1.0/1.0	586	55.0	2.9	73	46	21	16	7
(9)	35 MPH	98.0/1.0/1.0	49	44.2	0.2	14	9	4	3	1
PM Peak Hour:										
(1)	50 MPH	98.0/1.0/1.0	2,309	66.2	1.7	410	258	120	88	41
(2)	50 MPH	98.0/1.0/1.0	2,181	65.9	2.3	394	249	115	85	39
(3)	35 MPH	98.0/1.0/1.0	900	56.8	0.7	98	62	29	21	10
(4)	35 MPH	98.0/1.0/1.0	169	49.6	N/A	32	20	9	7	3
(5)	35 MPH	98.0/1.0/1.0	169	49.6	N/A	32	20	9	7	3
(6)	45 MPH	98.0/1.0/1.0	1,545	62.9	0.5	246	155	72	53	25
(7)	45 MPH	98.0/1.0/1.0	1,201	61.8	0.3	208	131	61	45	21
(8)	35 MPH	98.0/1.0/1.0	513	54.4	3.0	67	42	20	14	7
(9)	35 MPH	98.0/1.0/1.0	51	44.4	0.4	14	9	4	3	1

Note:

1. See TABLE 4 for Roadway Segments.

TABLE 8B

BUILD ALTERNATIVE; YEAR 2020; AM AND PM PEAK HR. SETBACK DISTANCES

ROADWAY SEGMENT	SPEED	VEHICLE MIX (%A/%MT/%HT)	TOTAL VPH	Leq @ 100' dB	CHANGE	**** DISTANCE (FT) FROM CENTERLINE **** 57 Leq	60 Leq	65 Leq	67 Leq	72 Leq
AM Peak Hour										
(1)	50 MPH	98.0/1.0/1.0	1,804	65.1	−0.1	348	219	102	75	35
(2)	50 MPH	98.0/1.0/1.0	2,631	66.8	1.5	447	282	131	96	45
(3)	35 MPH	98.0/1.0/1.0	1,574	59.3	2.4	142	89	41	31	14
(4)	35 MPH	98.0/1.0/1.0	15	39.1	N/A	6	4	2	1	1
(5)	35 MPH	98.0/1.0/1.0	124	48.2	N/A	26	16	8	6	3
(6)	45 MPH	98.0/1.0/1.0	729	59.6	−3.0	149	94	44	32	15
(7)	45 MPH	98.0/1.0/1.0	1,126	61.5	−0.0	199	126	58	43	20
(8)	35 MPH	98.0/1.0/1.0	780	56.2	4.1	89	56	26	19	9
(A)	35 MPH	98.0/1.0/1.0	1,389	58.7	14.7	131	82	38	28	13
(B)	35 MPH	98.0/1.0/1.0	1,366	58.7	–	129	81	38	28	13
(C)	35 MPH	98.0/1.0/1.0	1,509	59.1	–	138	87	40	30	14
(D)	50 MPH	98.0/1.0/1.0	1,509	64.3	–	308	194	90	66	31
(E)	50 MPH	98.0/1.0/1.0	1,366	63.9	–	289	182	84	62	29
PM Peak Hour										
(1)	50 MPH	98.0/1.0/1.0	1,497	64.3	−0.2	307	193	90	66	31
(2)	50 MPH	98.0/1.0/1.0	2,246	66.1	2.4	402	254	118	87	40
(3)	35 MPH	98.0/1.0/1.0	1,289	58.4	2.2	124	78	36	27	12
(4)	35 MPH	98.0/1.0/1.0	19	40.1	N/A	7	5	2	2	1
(5)	35 MPH	98.0/1.0/1.0	169	49.6	N/A	32	20	9	7	3
(6)	45 MPH	98.0/1.0/1.0	551	58.4	−4.0	124	78	36	27	12
(7)	45 MPH	98.0/1.0/1.0	1,230	61.9	0.4	212	133	62	46	21
(8)	35 MPH	98.0/1.0/1.0	781	56.2	4.8	89	56	26	19	9
(A)	35 MPH	98.0/1.0/1.0	1,432	58.9	14.9	133	84	39	29	13
(B)	35 MPH	98.0/1.0/1.0	1,380	58.7	–	130	82	38	28	13
(C)	35 MPH	98.0/1.0/1.0	1,270	58.3	–	123	78	36	26	12
(D)	50 MPH	98.0/1.0/1.0	1,270	63.6	–	275	173	80	59	27
(E)	50 MPH	98.0/1.0/1.0	1,380	63.9	–	290	183	85	63	29

Note:

1. See TABLE 8C for Roadway Segments.

TABLE 8C

IDENTIFICATION OF ROADWAY SEGMENTS

ROADWAY SEGMENT	BOUNDING INTERSECTIONS
Year 1996 (Existing Condition):	
(1)	Komohana St., (North of Mohouli St.)
(2)	Komohana St., (South of Mohouli St.)
(3)	Mohouli St., (East of Komohana St.)
(4)	Kukuau St., (North of Proposed Mohouli St.)
(5)	Kukuau St., (South of Proposed Mohouli St.)
(6)	Kaumana Dr., (North of Ainako Ave.)
(7)	Kaumana Dr., (South of Ainako Ave.)
(8)	Ainako Ave., (West of Kaumana Dr.)
(9)	Ainako Ave., (Kaumana Dr. to Uluwai St.)
Year 2020 (Base Condition, No Build Alternative):	
(1)	Komohana St., (North of Mohouli St.)
(2)	Komohana St., (South of Mohouli St.)
(3)	Mohouli St., (East of Komohana St.)
(4)	Kukuau St., (North of Proposed Mohouli St.)
(5)	Kukuau St., (South of Proposed Mohouli St.)
(6)	Kaumana Dr., (North of Ainako Ave.)
(7)	Kaumana Dr., (South of Ainako Ave.)
(8)	Ainako Ave., (West of Kaumana Dr.)
(9)	Ainako Ave., (Kaumana Dr. to Uluwai St.)
Year 2020 (Future Condition with Project):	
(1)	Komohana St., (North of Mohouli St.)
(2)	Komohana St., (South of Mohouli St.)
(3)	Mohouli St., (East of Komohana St.)
(4)	Kukuau St., (North of Proposed Mohouli St.)
(5)	Kukuau St., (South of Proposed Mohouli St.)
(6)	Kaumana Dr., (North of Ainako Ave.)
(7)	Kaumana Dr., (South of Ainako Ave.)
(8)	Ainako Ave., (West of Kaumana Dr.)
(A)	Mohouli St. Extension, (Kaumana Dr. to Uluwai St.)
(B)	Mohouli St. Extension, (35 MPH section west of Kukuau St. intersection)
(C)	Mohouli St. Extension, (35 MPH section east of Kukuau St. intersection)
(D)	Mohouli St. Extension, (High speed section from Kukuau St. to Komohana St.)
(E)	Mohouli St. Extension, (High speed section from Uluwai St. to Kukuau St.)

unobstructed, line-of-sight conditions. The results of the noise contour setback distance calculations of **TABLES 8A and 8B** were used to isolate structures and lands which may be impacted under the Build Alternative. As indicated in **TABLE 9**, no existing noise sensitive structures and lands are expected to be impacted under the Build Alternative along the project corridor as a result of traffic noise levels exceeding the FHWA standard of 67 Leq.

The following general conclusions can be made in respect to the effects of the No Build and Build Alternatives on the existing traffic noise levels in the project environs:

A. Under the No Build Alternative, traffic noise levels along the existing roadways at the east and west ends of the project corridor are predicted to increase by 0.2 to 3.0 dB or Leq(h). No significant changes in traffic conditions (average vehicle speed and vehicle mix) were assumed to occur by CY 2020 on the existing roadways. Because actual traffic conditions during the AM and PM peak hours may worsen under the No Build Alternative, with reduced speeds and increased delays expected during the peak hours, the predicted increases in traffic noise levels may be less than the range of 0.2 to 3.0 dB. However, increases in traffic noise levels during the historical off-peak hours may be of this magnitude.

B. Under the No Build Alternative, the larger increases in traffic noise levels of 1.4 to 3.0 dB are expected to occur along Komohana Street and along the section of Ainako Avenue west of Kuamana Drive. Along Kuamana Drive, Mohouli Street, and Ainako Avenue east of Kuamana Drive, relatively small increases in traffic noise levels of 0.2 to 0.8 dB are expected under the No Build Alternative.

C. Under the Build Alternative, traffic noise increases are expected to be greater than under the No Build Alternative along

TABLE 9

LIST OF NOISE IMPACTED EXISTING STRUCTURES AND LAND AREAS WITH THE PROJECT; YEAR 2020 (AM AND PM PEAK HOURS)

MOHOULI ST. EXTENSION SEGMENT	*********** NUMBER OF IMPACTED UNITS ********** PRIVATE STRUCTURES	PUBLIC USE STRUCTURES	PARK LANDS
AM Peak Hour:			
(A)	None	None	None
(B)	None	None	None
(C)	None	None	None
(D)	None	None	None
(E)	None	None	None
	--------	-------	------
Total:	0	0	0
PM Peak Hour:			
(A)	None	None	None
(B)	None	None	None
(C)	None	None	None
(D)	None	None	None
(E)	None	None	None
	--------	-------	------
Total:	0	0	0

Note:

1. See ABLE 8C for Mohouli Street Extension Segments.

the existing section of Mohouli Street east of Komohana Street and along Ainako Avenue on both sides of Kuamana Drive. Traffic noise levels are predicted to decrease along Kuamana Drive north of Ainako Avenue and along Komohana Street north or Mohouli Street under the Build Alternative. No significant changes in traffic noise levels under the Build Alternative are expected along Komohana Street south of Mohouli Street and along Kuamana Drive south of Ainako Avenue.

D. Under the Build Alternative, increases in existing background ambient noise levels are expected to be large (greater than 15 dB) along the high speed (50 mph) sections of the proposed Mohouli Street Extension. Fortunately, the lands adjoining the high speed sections of the proposed roadway are currently vacant, and the use of sound attenuation barriers and/or berms should not be required along the high speed sections of the proposed roadway.

E. Under the Build Alternative, relatively large increases in traffic noise levels are predicted to occur along the low speed (35 mph) sections of the Mohouli Street Extension Alignment in the vicinity of the Kukuau Street and Uluwai Street intersections. Because of existing and future dwelling units near these two intersections, additional evaluations of potential traffic noise impacts resulting from a significant increase in traffic noise levels were performed.

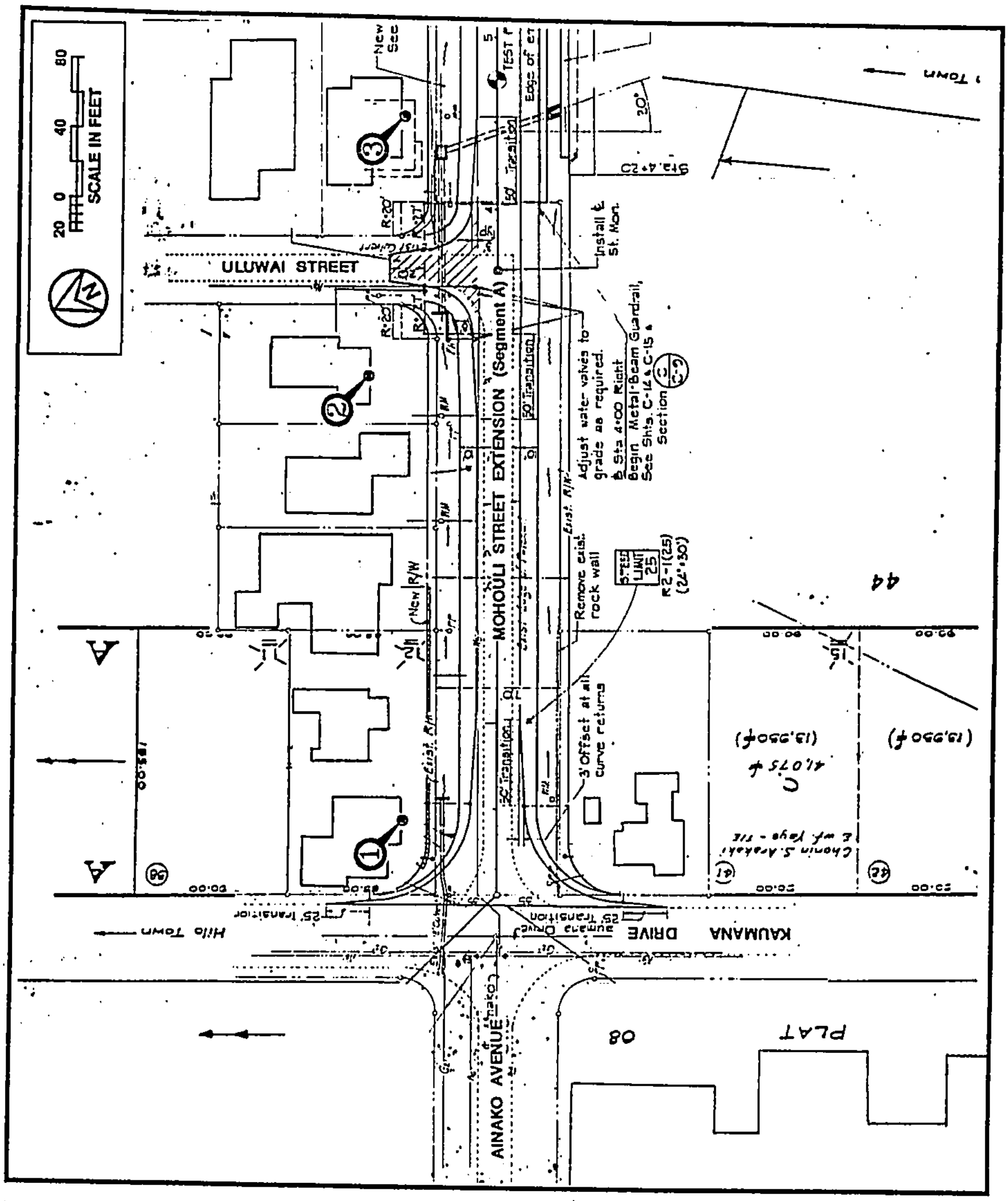
The future traffic noise levels at noise sensitive properties were calculated along the sections of the proposed Mohouli Street Extension in the vicinity of the proposed Kukuau Street and Uluwai Street intersections. The general locations of existing structures along the Mohouli Street Extension at Uluwai Street, as well as those existing vacant lots at the Kukuau Street intersection are shown in **FIGURES 8 and 9**, respectively. At the numbered locations (#1 thru #6) shown in the figures, exceedances of the FHWA

67 Leq, FHA/HUD 65 Ldn, and the State DOT ">15 dB increase" criteria were examined. The results of these evaluations are shown in **TABLE 10** for noise sensitive locations #1 thru #6.

The following general conclusions can be made in respect to the number of impacted structures and lands which would result from the Build Alternative. These conclusions are valid as long as the future vehicle mixes and average speeds do not differ from the assumed values.

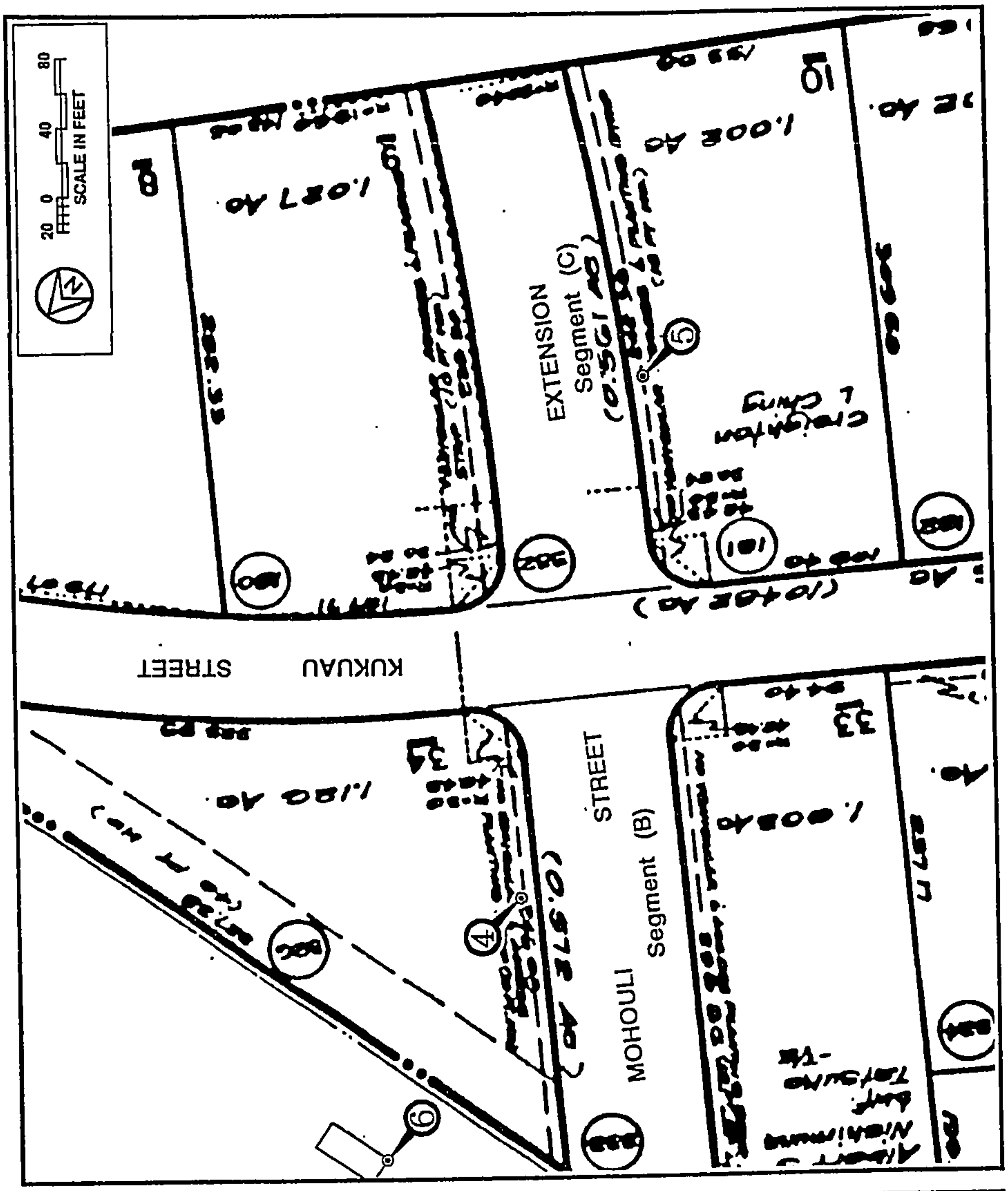
A. Future traffic noise levels along the west (Ainako Avenue) end of the Mohouli Street Extension are not expected to exceed FHWA or State DOT noise standards at existing noise sensitive residences along the proposed 80 foot wide Right-of-Way. The existing homes which front Kuamana Drive may exceed the FHA/HUD standard of 65 Ldn as a result of traffic noise contributions from both Kuamana Drive and the Mohouli Street Extension.

B. Future noise levels at the vacant lots and existing farm building near the Kukuau Street crossing are not expected to exceed state or federal noise standards.



PROPOSED ALIGNMENT OF MOHOULI STREET EXTENSION AT AINAKO AVENUE END

FIGURE 8



PROPOSED ALIGNMENT OF MOHOULI STREET EXTENSION AT KUKUAU STREET CROSSING

FIGURE 9

TABLE 10

SUMMARY OF EXISTING AND PREDICTED TRAFFIC NOISE LEVELS AT NOISE SENSITIVE RECEPTOR LOCATIONS ALONG MOHOULI STREET EXTENSION (5 FT RECEPTOR, AM OR PM PEAK HOUR)

RECEPTOR LOCATION	SETBACK DIST FROM R/W	EXISTING (CY 1996) Leq	FUTURE (CY 2020) Leq	INCREASE Leq
1 (Dwelling)	14 FT	62.8	65.8 *	3.0
2 (Dwelling)	32 FT	54.4	61.9	6.6
3 (Dwelling)	12 FT	52.5	63.2	10.7
4 (Vacant Lot)	10 FT	49.9	63.2	13.3
5 (Vacant Lot)	10 FT	49.9	63.6	13.7
6 (Farm House)	106 FT	49.9	56.2	6.2

Notes:

1. Receptor locations shown in FIGURES 8 and 9.
2. * Denotes exceedance of FHA/HUD 65 Ldn Standard for Residences.

CHAPTER V. POSSIBLE NOISE MITIGATION MEASURES

Possible noise mitigation measures considered included the following:

A. Restricting the Growth In the Number of Noisy Buses, Heavy Trucks, Motorcycles, and Automobiles with Defective Mufflers. The percentage contribution to the total traffic noise by heavy trucks, buses, and noisy vehicles is currently less than 50 percent, and elimination of these noise sources would reduce total traffic noise levels by less than 3 dB. Restricting the growth rate of these vehicles (to growth rates below passenger automobile growth rates) could produce noise reductions in the order of 1 or 2 dB, which are not considered significant for the level of regulatory efforts required.

B. Alteration of the Horizontal Or Vertical Alignment of the Highway. This mitigation measure has been incorporated into the Extension Alternative, and the proposed alignments represent the optimum alignment for the east and west sections of the Mohouli Street Extension.

C. Acquisition of Property Rights for Construction of Noise Barriers, and/or Construction of Noise Barriers Along the Right-of-Way. Along the existing and proposed roadway sections of the Mohouli Street Extension alignment, construction of noise barriers would normally be the preferred noise mitigation measure if such measures are required. The 5 to 10 dB of noise attenuation achievable with a 6 FT high wall is normally sufficient for all single story structures in most instances. However, because predicted traffic noise levels at noise sensitive properties are not expected to exceed FHWA and State DOT noise abatement criteria, the use of noise barriers along the Right-of-Way should not be required.

D. Acquisition of Real Property Interests To Serve As A Noise Buffer Zone. Where multistory structures are expected to be impacted by future traffic noise, the use of sound attenuating barriers (see para. C above) will not be practical due to the excessive heights required to shield the upper floors from traffic noise. In these situations, the only other noise mitigation possibilities are sound insulation of the affected upper floor units or acquisition of the property interests for noise buffer zones. In general, the acquisition of property for the creation of noise buffer zones or noise mitigation has seldom been applied in Hawaii. Where existing multistory homes or apartment complexes are within the high noise zones, the application of sound insulation treatment should be evaluated prior to consideration of property acquisition for noise mitigation. Along the Mohouli Street Extension alignment, additional acquisition of real property for noise buffer zones should not be required.

E. Noise Insulation of Public Use or Nonprofit Institutional Structures. Based upon currently available information and traffic forecasts, this mitigation measure should not be required for this project to meet FHWA or State DOT noise abatement criteria.

CHAPTER VI. FUTURE TRAFFIC NOISE IMPACTS AND RECOMMENDED NOISE MITIGATION MEASURES

Future traffic noise impacts are not expected to occur at existing noise sensitive homes or properties along the proposed Mohouli Street Extension between Kuamana Drive and Komohana Street. As such, traffic noise mitigation measures should not be required along the project corridor.

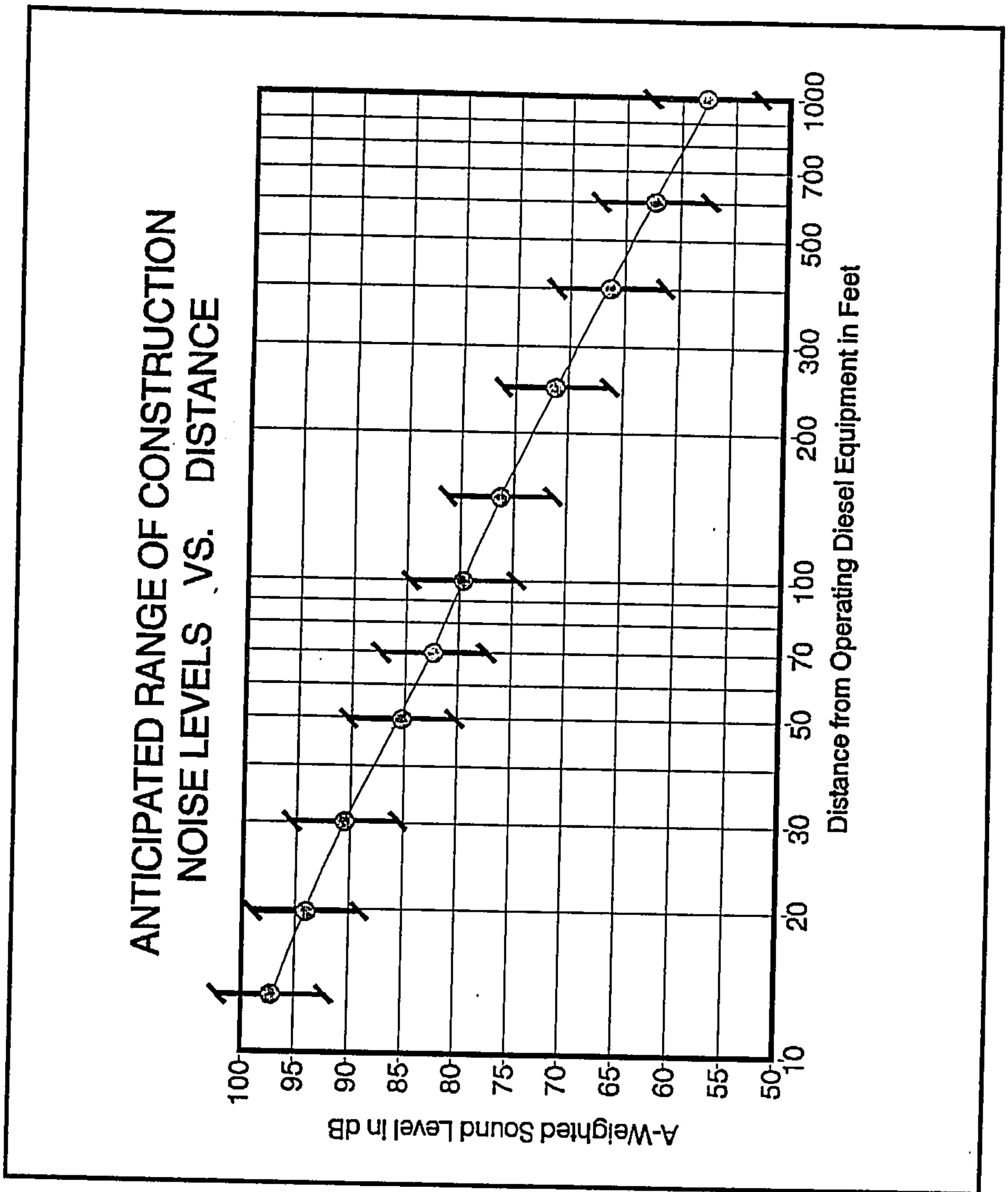
Alongside the currently undeveloped sections of the proposed extension alignment, it is anticipated that potential noise impacts at future noise sensitive receptors along the final roadway alignment may be mitigated through the inclusion of sound walls or other noise mitigation measures within the individual project development plans. In addition, the future noise sensitive land uses which may be planned along the extension alignment represent areas of potential adverse noise impacts if adequate noise mitigation measures are not incorporated into the planning of these projects. It is anticipated that the portions of the Mohouli Street Extension segments may be completed prior to the development of the lands adjacent to the new roadway sections. Under these conditions, noise abatement measures such as adequate setbacks, construction of sound attenuating walls or berms, or closure and air conditioning would probably be incorporated into these new developments along the new Mohouli Street Extension sections as required. The predictions of highway noise levels vs. distance from the centerline of the new Mohouli Street Extension segments (**TABLES 8A and 8B**) may be used to assist the developers in providing the necessary setbacks to the new roadway segments.

CHAPTER VII. CONSTRUCTION NOISE IMPACTS

Short-term noise impacts associated with new construction activities along the project corridor may occur. These impacts can occur as a result of the short distances (less than 100 FT) between existing noise sensitive receptors and the anticipated construction sites, particularly along the roadway sections which cross through residential areas. The total duration of the construction period for the proposed project is not known, but noise exposure from construction activities at any one receptor location is not expected to be continuous during the total construction period.

Noise levels of diesel powered construction equipment typically range from 80 to 90 dB at 50 FT distance. Typical levels of noise from construction activity (excluding pile driving activity) are shown in **FIGURE 10**. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in **FIGURE 10**, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Construction noise levels at existing structures can intermittently exceed 90 dB when work is being performed at close distances in front of these structures. Along the major portion of the project corridor, distances between the construction sites and receptors are expected to be greater than 100 FT, and construction noise levels should generally be below 80 dB or inaudible. The State Department of Health currently regulates noise from construction activities on Oahu under a permit system (**Reference 8**).



CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 10

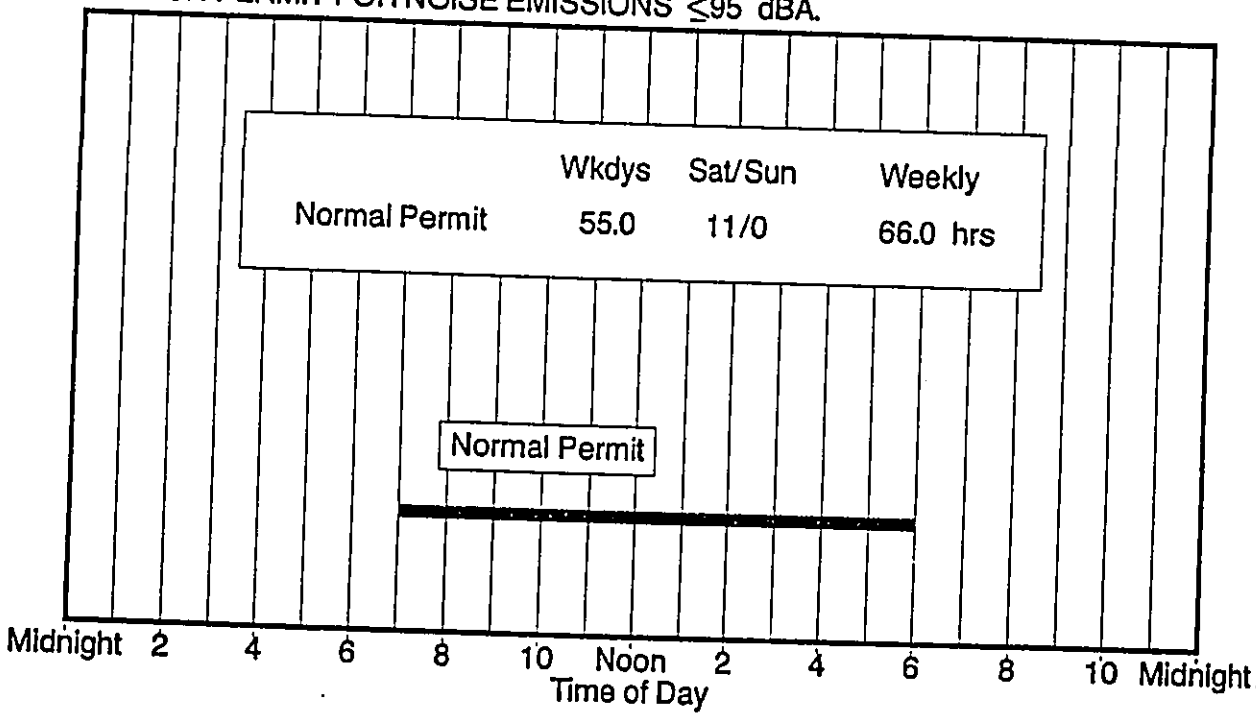
Under current permit procedures (see **TABLE 11**), noisy construction activities which exceed 95 dB at the project boundary lines are restricted to hours between 9:00 AM and 5:30 PM, from Monday through Friday, and exclude certain holidays. These restrictions can minimize construction noise impacts on noise sensitive receptors along the project corridor, and have generally been successfully applied. Consideration should be given to employing the curfew system of the State Department of Health regulations relating to excessive construction noise. In this way, construction noise impacts on noise sensitive receptors can be minimized.

In addition, the use of quieted portable engine generators and diesel equipment should be specified for use within 500 FT of noise sensitive properties. Heavy truck and equipment staging areas should also be located at areas which are at least 500 FT from noise sensitive properties whenever possible. Truck routes which avoid residential communities should be identified wherever possible. The use of 8 to 12 FT high construction noise barriers should also be used where close-in construction work to noise sensitive structures are unavoidable.

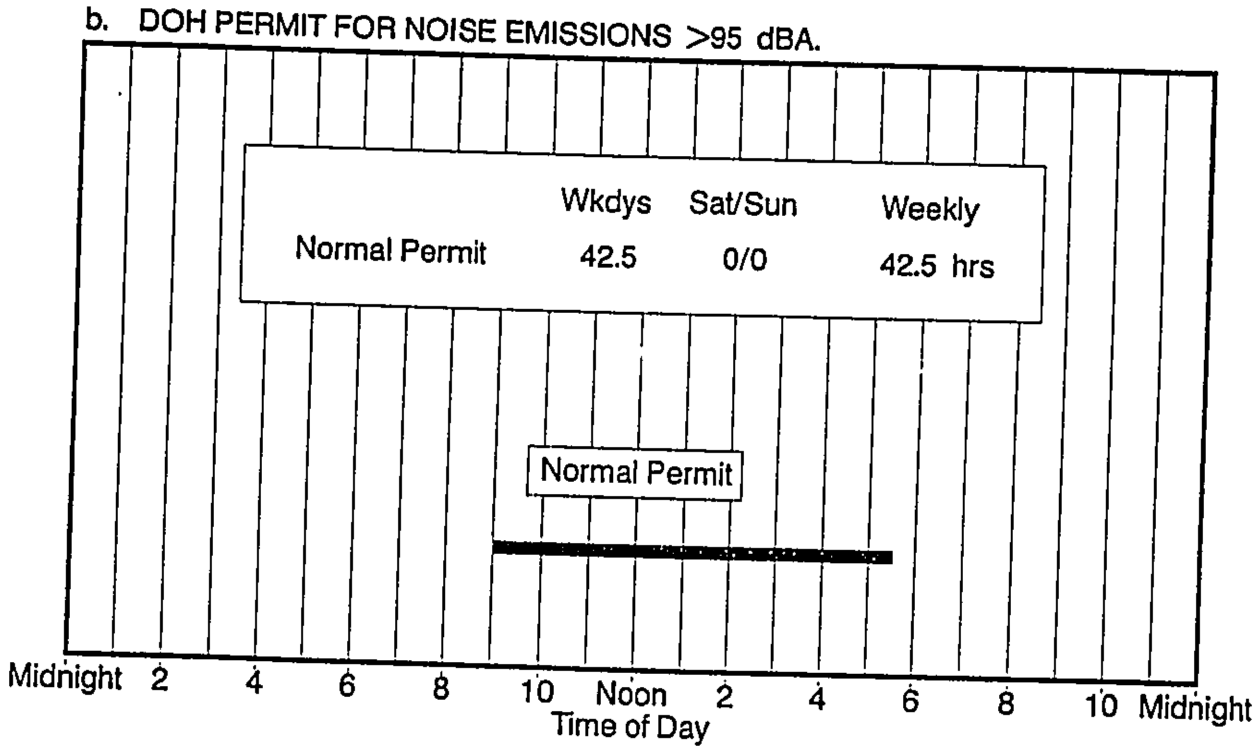
TABLE 11

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

a. DOH PERMIT FOR NOISE EMISSIONS ≤95 dBA.



b. DOH PERMIT FOR NOISE EMISSIONS >95 dBA.



APPENDIX A. REFERENCES

(1) Barry, T. and J. Reagan, "FHWA Highway Traffic Noise Prediction Model;" FHWA-RD-77-108, Federal Highway Administration; Washington, D.C.; December 1978.

(2) CY 1996 and CY 2020 traffic assignments and forecasts for Mohouli Street Extension Project; Transmittals from Julian Ng, Inc. dated June 5 and July 8, 1996.

(3) 24-Hour Traffic Counts and Vehicle-Type Classification, Station 18-HH, Komohana St. at Ponahawai St.; June 27-28, 1994; Hawaii State Department of Transportation.

(4) 24-Hour Traffic Counts, Station C-19-D, Kaumana Dr. at Ainako St.; June 27, 1994; Hawaii State Department of Transportation.

(5) 24-Hour Traffic Counts, Station C-19-D, Ainako Ave. at Kaumana Dr.; June 27, 1994; Hawaii State Department of Transportation.

(6) Federal Highway Administration; "Procedures for Abatement of Highway Traffic Noise and Construction Noise;" 23 CFR Chapter I, Subchapter J, Part 772; April 1, 1995.

(7) February 1, 1995 Letter from Ron Tsuzuki, State DOT to AMFAC/JMB Hawaii, Inc.; HWY-PA 2.4400.

(8) "Title 11, Administrative Rules, Chapter 43, Community Noise Control for Oahu;" Hawaii State Department of Health; November 6, 1981.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

TERM	SYMBOL
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78, NOISE REGULATION REPORTER.

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

TERM	A-WEIGHTING	ALTERNATIVE(1) A-WEIGHTING	OTHER(2) WEIGHTING	UNWEIGHTED
1. Sound (Pressure) (3) Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level (4) Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average value over (non-time domain) set of observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level exceeded x% of the total set of (non-time domain) observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

Appendix 4

FLORA AND FAUNA REPORT
FOR
MOHOULI STREET EXTENSION

FLORA AND FAUNA REPORT

FOR

MOHOULI ST. EXTENSION

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June 14, 1996

FLORA AND FAUNA REPORT FOR MOHOULI ST. EXTENSION

TABLE OF CONTENTS

FLORA AND FAUNA REPORT FOR MOHOULI ST. EXTENSION

EXECUTIVE SUMMARY

A flora and fauna study was conducted of the proposed right-of-way for the extension of Mohouli St. from Ainako Ave. to Komohana Ave. This study was conducted on behalf of the Public Works Department, County of Hawaii, to provide documentation for an Environmental Assessment as required by the National Environmental Policy Act and Hawaii Revised Statutes Chapter 343. The site of the proposed project is on the ouskirts of the city of Hilo in the South Hilo District, County of Hawaii (Island of Hawaii), on the lower slopes of Mauna Loa between 260 and 420 feet (80 and 130 meters) above sealevel.

The project site is generally vacant land. Slightly more than half of the length of the project site is on the 1881 lava flow, vegetated by low-stature forest dominated by the native 'ohi'a-lehua (Metrosideros polymorpha var. incana) and the mat-forming fern, uluhe (Dicranopteris linearis). It appears this plant community contains no rare species or other legally protected biological resource; however, it is the youngest flow at low elevation in the immediate Hilo area and is an important element in the spatial biodiversity of Hilo. Reasonable efforts should be made to minimize the area of this vegetation type to be cleared.

The remainder of the proposed site is abandoned agricultural lands now covered with thick mats of introduced grasses and scatterred thickets of introduced trees. These communities have no special biological resource valuess. Ordinary precautions should be taken to minimize soil erosion during construction and to revegetate the site.

A total of eighty plant species were recorded on the project site: sixty-two of these are introduced species and eighteen are naitve to Hawaii. No plants listed, or proposed for listing, as threatened or endangered by the U.S. Fish and Wildlife Service were found within or near the propcsed right-of-way.

No endangered or otherwise rare bird or mammal species were observed within the project site. However it is possible that several species of native birds forage or fly over the site. In the unlikely event that a nest of the 'I'o (Hawaiian Hawk) is found, it should be left undisturbed until the chicks have left the nest. Street lights should be shielded to prevent light shining upwards that might be harmful to night-flying seabirds, including the Endangered 'Ua'U (Dark-Rumped Petrel) and the 'A'o (Newell's Shearwater).

No flowing streams or well-developed stream channels were found within the project site. Distinct, poorly drained sites with clear wetland indicators were found near Komohana St with an estimated cumulated area of no more than 3000 sq. ft. Other wetland indicators can be found locally at other points, but the majority of them were found to lack one or more of the essential criteria of regulated wetlands. It is recommended that attention should be given to erosion control during construction to prevent pollution of streams with watersheds in the project site (Alenaio and Waiakea Streams) and that informal consultations be initiated with the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers to seek concurrence with the finding that no streams or other aquatic habitat occur within the project site and to confirm the preliminary estimate of the extent of wetlands within the project site.

FLORA AND FAUNA REPORT FOR MOHOULI ST. EXTENSION

1.0 INTRODUCTION

A flora and fauna study was conducted of the proposed right-of-way for the extension of Mohouli St. from Ainako Ave. to Komohana Ave. The purpose of this study is to describe and evaluate the plant and animal life of the proposed right-of-way and to identify ecologically sensitive or valuable biological resources. Special attention was given to the search for rare or listed endangered species, and for ecosystems that might be unique to the project area. The vegetation characteristics were used to identify areas that may be wetlands, as regulated by the U.S. Corps of Engineers under the Clean Water Act and other federal laws.

This study was conducted by biologist, Grant Gerrish, Ph.D. on behalf of the Public Works Department, County of Hawaii, to provide documentation to be included in an Environmental Assessment as required by Hawaii Revised Statutes Chapter 343.

2.0 SITE DESCRIPTION AND METHODS

2.1 SITE DESCRIPTION

The site of the proposed project is on the ouskirts of the city of Hilo in the South Hilo District, County of Hawaii (Island of Hawaii) within the lands (ahupua'a) identified as Ponahawai and Kukuau I and II (USGS 1981). The site is on the lower slopes of Mauna Loa, an active shield volcano, between 260 and 420 feet (80 and 130 meters) above sealevel. The substrate of a large portion of the project site was formed by the 1881 lava flow from Mauna Loa, the volcanic origin of the remainder of the land surface was prehistoric. The aspect of the project site faces the prevailing northeast trade winds and receives high annual rainfall. (Figure 1.)

The project site is generally vacant land. The portion on the 1881 lava flow is predominantly vegetated by primary, native low-stature forest. The remainder of the proposed site is abandoned agricultural lands. Portions of two public streets traverse the site (Uluwai St. and the extension of Kukuau St.).

The study area for the proposed right-of-way is 200 feet (61 meters) in width and 6,677 feet (2054 meters) long. The width of the actual right-of-way would be approximately 60 feet (18 meters). At the time of the field survey described herein, the center-line of the proposed right-of-way had been surveyed and staked at 100 foot (31 meter) intervals. The boundaries, 100 feet (31 meters) either side of the center-line, were also surveyed and marked with stakes at less frequent intervals. These survey stakes permitted an accurate flora and fauna survey of the proposed right-of-way and precise location of features of interest. Within this report, locations are reported in reference to these survey stakes, eg. "1600' survey marker," meaning at the stake inscribed as "16 + 00" which is located 1600 feet from the origin of the proposed right-of-way at Kaumana Drive.

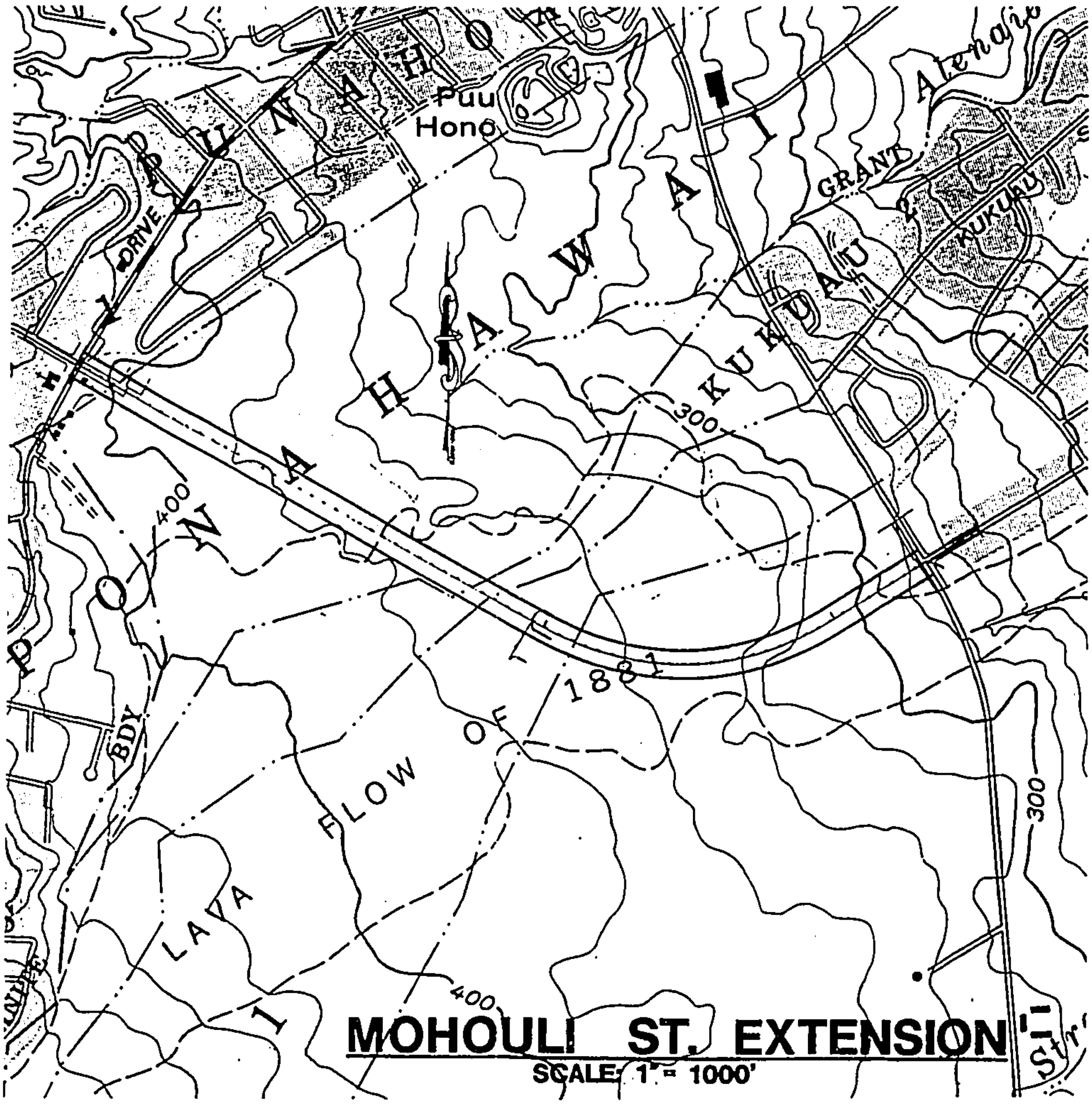

Figure 1. Site Plan.

2.2 FLORA STUDY

The study began with a literature search to determine which, if any, plant species listed or proposed for listing as endangered or threatened by the U. S. Fish and Wildlife Service might occur within the region of the proposed Puainako St. extension. Such listed plants are legally protected by federal and State law. The lists of threatened and endangered plants were reviewed (*Federal Register* 1990a, 1990b; and updated lists provided by USFWS, Pacific Islands Office, Honolulu). The ranges of listed and proposed plants were determined from the Manual of Flowering Plants of Hawai'i (Wagner et al. 1990).

The field survey consisted of an intensive visual search along the entire right-of-way by the botanist carried out on three days in March and April, 1996. All segments of the right-of-way center-line were walked at least once. Excursions were frequently made to the right-of-way boundaries, and beyond, when necessary to determine the vegetation characteristics or physical factors affecting the vegetation of the project site.

Vegetation descriptions were recorded in all plant communities encountered along the right-of-way and all plant species found were recorded. A list of all vascular plant species found within the project site was compiled (Table 1). The list includes the following information for each plant species: the region of origin, lifeform, estimate of abundance in each major community type of the project site, and Wetland Indicator Status (USFWS 1988). Nomenclature used for flowering plants generally follows Wagner et al. (1990); plants not listed in that source are named according to St. John (1973). Fern nomenclature follows Neal (1965), for the most part, or secondarily, Mueller-Dombois et al. (1980).

Factors controlling the vegetation pattern were analyzed. The Soil Survey (Sato et al. 1973), the U.S. Geological Survey topographic maps, Hilo Quadrangle (USGS 1981), and other sources were consulted for information relating to substrate age and type and to land-use history.

2.3 FAUNA STUDY

Observations of birds and mammals were also recorded during the field survey. Bird names are in accordance with the published list of the Hawaii Audubon Society (HAS 1989). No observations of invertebrate animals were made or recorded. The Federal Register (1990a and 1990b) and updated lists of Endangered Species (USFWS 1994) were consulted to see if any animals observed or likely to be present are listed or proposed for listing as Endangered or Threatened Species by the U.S. Fish and Wildlife Service. Finally, the National List was consulted to determine the wetland-indicator status of each plant species (USFWS 1988).

2.4 WETLAND HABITAT SURVEY

Special attention was given to searching for plant species or site conditions that may indicate the presence of wetlands. Areas that may contain wetlands were identified using vegetation data from the field surveys and information from the soil survey (Sato et al. 1973). This analysis of wetland habitats was guided by the Corps of Engineers Wetlands Delineation Manual (Corps of Engineers 1987) and the National List of Plant Species That Occur in Wetlands: Hawaii (Region H) (U.S. Fish and Wildlife Service 1988). The vegetation, soil and hydrological criteria defined in the Delineation Manual are used in this report to identify parts of the project area that have one or more indicators of wetland habitat.

3.0 RESULTS

3.1 SUBSTRATE AND GENERAL SITE CONDITIONS

The proposed right-of-way traverses two major substrate types. These are identified in the Soil Survey (Sato et al 1973) as 1) a shallow organic soil over prehistoric Mauna Loa pahoehoe lava, and 2) the 1881 lava flow with very little soil development. The existing vegetation and the land use histories of these two types are very different and distinct.

The first type is a lithic tropofolist mapped as Keaukaha extremely rocky muck, denoted by the map symbol rKFD (Sato et at 1973). This soil series is generally described as 2 to 8 inches thick and rapidly permeable. Within the project area, this substrate type extends from Survey Marker 0' at Kaumana Drive to Survey Marker 2400', at the edge of the 1881 Lava Flow.

The soil, vegetation and conditions of this segment of the right-of-way have been greatly alterred by human activity. The right-of-way was graded, presumably in preparation for construction of the Mohouli St. extension, ten years or more ago. The grading produced a near-level surface. Apparently, all or most of the soil was removed; today, in many places, the surface is solid pahoehoe lava with no overlying soil. The surrounding area was once used for sugarcane production , but is now abandoned or little-used. The land adjacent to the project site is developing a secondary forest of introduced trees. Because of the past grading, the right-of-way supports a more open, mostly grassy vegetation.

The other major substrate type along the right-of-way is the 1881 lava flow, extending from about the 2400' Survey Marker to the junction with Komohana St. at the 6677' Survey Marker. This pahoehoe lava flow from Mauna Loa is designated on the Soil Survey by the map symbol rLW (Sato et al 1973). This recent lava flow has very little soil development and, consequently, has not for the most part been cleared and used for agriculture. This segment of the right-of-way was only partially graded in the past. From Survey Marker 4200', near the extension of Kukuau St., to the proposed junction at Komohana St., the vegetation of only a narrow strip about 20' shows the affect of past right-of-way survey, clearing or grading.

3.2 FLORA

3.21 VEGETATION OF THE PROJECT AREA

3.211 ORIGINAL VEGETATION

Originally, the natural vegetation of most of the project area was 'Ohi'a/Uluhe (Metrosideros/Dicranopteris) Fern Forest, which is a subtype of the Lowland Wet Forest (Gagne and Cuddihy 1990). This 'Ohi'a/Uluhe Fern Forest community is associated with young lava flows and shallow soils on the lower windward slope of Mauna Loa. This community is dominated by a deep mat of uluhe, more or less scattered 'ohi'a trees, and relatively few other plant species. This simple, primary vegetation now exists only on undisturbed areas of the 1881 lava flow.

3.212 EXISTING VEGETATION OF THE PROJECT AREA

The major vegetation types or plant communities found within the proposed right-of-way are described below. This narration describes the vegetation as it is encountered moving along the right-of-way, generally southeastward from Kaumana Dr. to Komohana St.

The proposed right-of-way from Survey Marker 0' to 400' is superimposed over the existing Uluwai St. The northeast side of this paved street is landscaped residences. The southwest side is a secondary forest of African tulip trees (Spathodea campanulata), octopus tree (Shefflera actinophylla), fiddlewood (Citharexylem caudatum), and common guava (Psidium guajava); with a sparse understory of thimbleberry (Rubus rosifolius) and palmgrass (Setaria palmifolia).

Near Survey Marker 400', the proposed right-of-way enters long-abandoned fields. Nearly the full 200-foot width of the proposed right-of-way was graded long ago. All of the vegetation from this point to the 1881 lava flow near Survey marker 2400' can be characterized as secondary plant communities reinvading abandoned agricultural land and the graded right-of-way. Generally, the vegetation where previously graded is made up of herbaceous plants, often dominated by thick grass mats with a variety of other herbs and scattered trees of the secondary forest. Where the right-of-way has not been graded, thickets of secondary forests occur.

The species makeup of this secondary vegetation is highly variable. Dense mats over one meter high of California grass (Brachiaria mutica) and wainaku grass (Panicum repens) are extensive. Usually one or the other grass has nearly one-hundred percent cover, with other herbaceous species sparingly included. Scattered woody shrubs, such as melastoma (Melastoma candidum), Stachytarpheta urticifolia, and comb hyptis (Hyptis pectinata) grow through the grass mats. A few invading trees of melochia (Melochia umbellata), gunpowder tree (Trema orientalis), fiddlewood and African tulip are widely scattered

It appears that a small amount of pedestrian and other light traffic has maintained a trail through this area near the centerline of the proposed right-of-way. This traffic or other uses has been sufficient to cause a visual difference between the vegetation within approximately 20' of the centerline and the vegetation farther away. The mat-forming California and wainaku grasses are largely replaced by Hilo grass (Paspalum conjugatum), ricegrass (P. scrobiculatum), and molasses grass (Melinis minutiflora) and a wide variety of other herbaceous and semi-woody plants such as sensitive plant (Mimosa pudica) and Stachytarpheta.

Thickets often occur at the outer edges of the proposed right-of-way. These appear to be in places that were not previously graded. The species composition of these closed thickets is variable. The more common trees include Alexander palm (Archontophoenix alexandrae), melastoma, and especially waiawi or strawberry guava (Psidium cattleienum). Both the yellow-fruited and red-fruited strawberry guavas were found in fruit in the project area. The yellow-fruited form is known on the Island of Hawaii as waiawi; this name is not here applied to the red-fruited form, which is generally called 'strawberry guava.' The two forms cannot be easily distinguished when not bearing fruit. The distinction is of some regulatory importance because the two forms have different statuses as wetland indicators. The name Psidium cattleienum form lucidum is identified with the yellow-fruited form that grows on the windward side of the Island of Hawaii (Degener 1975), and it is this yellow-fruited form that was intended to be identified by that name as a 'Facultative' species on the National List (USFWS 1988; Personal Communication R. Lani Stemmermann 1995).

Near Survey Marker 1800', the thickets impinge toward the centerline of the proposed right-of-way and become somewhat intermixed with grassy patches. It is not known if this indicates a narrow strip was graded or more advanced tree invasion of the grade in this area. Whatever the cause, the vegetation from Survey Marker 1800' to the 1881 lava flow is very heterogeneous.

Generally, the vegetation of the 1881 lava flow is dominated by the native 'ohi'a-lehua (Metrosideros polymorpha var. incana) and the mat-forming fern, uluhe (Dicranopteris linearis). Where the vegetation has not been cleared or heavily disturbed, the plant community is an open stand of saplings and pole-sized 'ohi'a trees. The tallest of these are about 25-feet tall. In some places these small trees are closely spaced, forming a completely closed canopy,but more generally, the trees are widely spaced, producing a canopy with less than fifty percent cover.

In undisturbed parts of these stands, where uluhe forms dense mats up to 2 m thick, few other species of plants may be found. Native plants that do occur infrequently are 'ahaniu (Machaerina mariscoides), 'uki (M. angustifolia), pukiawe (Styphelia tameiameiae), neneleau (Rhus sandwicensis), and wawai-'iole (Lycopodium cernuum). Invading, introduced plants are infrequent within the deep uluhe mats. Those that do occur are bamboo orchid (Arundinia bambusifolia), broomsedge (Andropogon virginicus), and scaly swordfern (Nephrolepis multiflora). Invading woody plantsd are limited to melastoma, strawberry guava or waiawi, rose myrtle (Rhodomyrtus tomentosa) and wax myrtle (Myrica cerifera).

Disturbed sites within this 'ohi'a community have a much higher frequency and wider variety of introduced plants. From the 2400' Survey Marker to the 4200' Survey Marker on the southwest side of Kukuau St., much of the right-of-way was disturbed by grading. The 'ohi'a/uluhe open forest described above ie evident near the edges of the 200-foot wide proposed right-of-way, but the center has few 'ohi'a trees and the groundcover is dominated by introduced grasses and other herbs. Most common of these grasses are broomsedge, wainaku grass and little bluestem. The other introduced plants named in the above paragraph occur on these disturbed sites, as well as the secondary tree species, melochia, trema and shefflera.

The 'ohi'a/uluhe open forest continues from 4200' to the 6100' Survey Marker. Most of this extent is relatively undisturbed with extensive cover of uluhe. Throughout this segment, approximately 20 feet on both sides of the centerline appear to have been disturbed in the past and are now by dominated introduced grasses and shrubby waiawi trees less than 2 m tall.

From the 6100' Survey Marker to the junction with Komohana at Survey marker 6677, the vegetation is more heavily disturbed. In places, the 'ohi'a open forest is completely replaced by introduced secondary growth, often dominated by waiawi up to 25 feet tall or java plum (Syzigium cumini). Small grassy pools also occur in this same segment. These pools had standing water up to 30 cm deep at the time of the field survey in March and April 1996. The pools lack trees, but have a near-complete cover of emergent wainaku grass. Herbs such as kamole and honohono (Commelina diffusa) also grow in these localized bogs.

3.22 PLANT SPECIES OF THE PROJECT AREA

A large proportion of the plant species recorded from the entire length of the proposed right-of-way are plant species that were introduced to Hawaii by people (Table 1). Sixty-two of the total eighty species found are such alien or introduced species. Eighteen species naitve to Hawaii were recorded. Of these, fifteen are indigenous species and three are endemic, meaning naturally occuring only in Hawaii.

3.23 ENDANGERED PLANTS

No plants listed, or proposed for listing, as threatened or endangered by the U.S. Fish and Wildlife Service were found within or near the proposed right-of-way, nor were any other plant species considered rare found.

3.3 FAUNA

3.31 MAMMALS

No mammals were observed within the proposed project during the field survey. Scat of a small mammal, probably the Small Indian Mongoose was observed a number of times. It is probable that feral dogs and cats and introduced rats and mice utilize the project site.

3.32 BIRDS

Few birds were observed during the field survey. Introduced birds seen or heard during the field survey were the Japanese White-eye (Zosterops japonicus), Nutmeg Mannikin (Lonchura punctulata), Common Myna (Acridotheres tristis), Hwamei or Melodious Laughing thrush (Garrulax canorus), Zebra Dove (Geopelia striata) and the Northern Cardinal (Cardinalis cardinalis). Other species of introduced birds may also utilize the site.

3.33 ENDANGERED ANIMALS

No endangered or otherwise rare bird or mammal species were observed within the project site.

3.4 STREAMS AND WETLANDS

3.41 STREAMS

No flowing streams or well-developed stream channels were found within the project site. The USGS (1981) Hilo Quadrangle Topographic Map (7.5 minute series) also shows that no perennial or intermittent streams traverse the project site.

The Floodzone map prepared by FEMA and on file at the County of Hawaii Public Works Department shows streams and flood zones existing within two parts of the project site. Alenaio Stream, bordered by a narrow band of floodzone, is shown crossing the proposed right-of-way near the 1640' survey marker. Alenaio Stream is shown continuing southwest beyond the project site and connecting with Waipahoehoe Stream.

A comparison of the Floodzone map with the USGS Hilo Quadrangle Map shows that the Floodzone map is in error. The USGS Map portrays Alenaio Stream as intermittent and originating below (east side) the project site, not crossing the proposed right-of-way. The USGS Map also shows that Waipahoehoe Stream does not connect with Alenaio Stream. This map does show broad deflections of the 20-foot contour lines within the project site that appear to be part of a drainage pattern leading to Alenaio Stream.

The field survey did find indications of water movement across the proposed right-of-way between approximately 1600' and 2400' survey markers. A culvert has been placed across the previously-graded right-of-way at the 1640'marker. The culvert is approximately 36 inches in diameter with a channel approximately 2 feet wide and 2 feet deep leading to it. No water was found in the channel during the field survey in March and April 1996. This channel does not continue as a distinct feature above or below the culvert.

In this same area, flattened vegetation showed that water had recently flown across the proposed right-of-way. Such signs were especially evident at 1750',1900-2000', and 2100 to 2200' markers. Near the 2200' marker, the flow of water had uprooted small clumps of mature waiawi trees. Within these areas, the ground surface is gullied and often revegetated. None of the gullies appear to be permanent channels and no pools of standing water were found.

The other area shown on the Floodzone map is near the junction with Komohana Street. Here, a broad area of flood zone is shown associated with an unnamed tributary of Waiakea Stream. The USGS map shows this tributary as an unnamed perennial stream that originates outside the project site and does not traverse the proposed right-of-way. The field survey confirmed that there is no stream within this part of the project site. Poorly drained depressions with water ponding were found between the 6100' and 6500' survey markers.

3.42 WETLANDS

The Wetland Indicator Status of each plant species recorded during the field surveys is given in Table 1. Those identified as 'F' and 'FW' are species known to occur in both wetland and non-wetland conditions, and are generally called 'facultative species.' Those species identified as 'OBL' are called 'obligate species' and are thought to occur in wetland conditions 99% of the time (USFS 1988).

Many facultative species were found within the project site. In some areas, the vegetation is dominated by such plants, including California grass (Brachiaria mutica), Wainaku grass (Panicum repens), 'ohi'a (Metrosideros polymorpha var incana), waiawi (Psidium cattleienum) and scaly swordfern (Nephrolepis multiflora). One obligate species, kamole (Ludwigia octovalis) was frequently found in some areas.

The secondary vegetation on abandoned fields, from survey markers 400' to about 2400' is often dominated by California grass and Wainaku grass and contains other facultative species and, locally, the obligate species kamole. Because of the presence of the obligate species, the hydrology and soils of these sites were inspected. In certain areas between the 400' and 700' survey markers, standing water was found on the substrate surface, usually below dense mats of grass.

It was noted that in this part of the project site, previous grading has left the surface nearly level and removed most or all of the soil. In some areas, the lack of soil beneath the surface water made determination of soil properties problematic. In other areas, up to 10 cm of very stoney soil was found above pahoehoe lava bedrock. In some places, this soil was inundated or saturated with water. However, even these wet soils possessed distinct structure and lacked indicators (Corps of Engineers 1987) of hydric soils (associated with wetlands). Specifically, the soils did not show gleying, mottles or low matrix chroma; fine roots were abundant throughout with no visible oxidation of root channels; and their was no sulfidic odor. It is possible that the ponding was due to slow runoff on this level site of recent heavy rains.

Between 1600' and 2400' survey markers, where evidence of surface flow was noted above, the vegetation was found not to be dominated by facultative and obligate species, and the soil was well-drained with strong structure.

The portion of the project site on the 1881 lava flow is generally well-drained and covered by vegetation not dominated by facultative species. No obligate species were found on this substrate, which in most places is bare pahoehoe lava. The proposed right-of-way from about the 2400' to 6100' marker appears to contain no wetlands.

From the 6100' to the junction with Komohana St. near 6500' marker, parts of the 1881 lava flow appears to be covered with silt deposits associated with water movement. This area is shown on the Floozone maps as a drainage area leading to Waiakea Stream. In general, the vegetation was found not to be dominated by facultative and obligate species and the soil is clearly well-drained. Several undrained depressions were found. These were inundated by up to 30 cm of water and dominated by wainaku grass, a facultative species, along with kamole and other species strongly associated with wetlands. The soil was completely saturated with water and structureless.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 CRITERIA FOR DETERMINING GENERAL AND BIOLOGICAL RESOURCE VALUE

All vegetation has general resource value regardless of the species present, whether dominated by native or introduced plants, or the rarity or abundance of the species present. These general values include control of soil erosion, retention of water in the soil, atmospheric cooling, noise reduction and aesthetic value associated with greenery and open space. The vegetation of the project area provides these resource values to the Hilo community.

Biological resource value refers to values that individual species have because of their important role in supporting the ecosystem, uniqueness or rarity. A community with a unique combination of plant species or that is habitat for valuable animal species also has biological value. For the purposes of the present assessment, introduced plants and animals are considered to have general value but no biological resource value because these introduced species are abundant in other parts of the world.

Biological values identified in this report are

1) vegetation dominated by native plants, especially if the plant community is a combination of species found only in that area;
2) plant communities that support native animal species.;
3) rare or Endangered or Threatened native plants and animals and the ecosystems that support them.

Wetland communities are also protected under State and Federal law.

Finally, biological resource value was also determined by concerns identified by the U.S. Fish and Wildlife Service (USFWS), Office of the Pacific Islands Ecoregion, Honolulu, Hawaii. USFWS responded with a letter of comment to the Notice of Intent to prepare an Environmental Assessment for the proposed Extension of Mohouli St. This letter (Appendix A), identifies species, communities and other resources of concern over which USFWS may have regulatory jurisdiction. These concerns are addressed in the present report to the extent that they fall within the scope of a Flora and Fauna Study.

4.2 VEGETATION

4.21 DISCUSSION

The secondary vegetation now present on abandoned agricultural land is made up almost entirely of introduced plants and appears to be unimportant as habitat for native animals. This vegetation has no biological resource value.

The vegetation on the 1881 lava flow, between the 2400' and 6500 'survey markers is predominantly native 'ohi'a/uluhe open forest. This is an early succession forest of naturally low species diversity, containing no rare plants. Invasion and degradation of the community by introduced plant species is low to moderate within the project site.

The 1881 lava flow is the youngest flow at low elevation in the immediate Hilo area. Its presence is an important element in the spatial biodiversity of Hilo. Clearing the proposed right-of-way for construction of the Mohouli Street extension would fragment this community by almost completely traversing the lava flow.

It appears that this habitat is not of significant value to native vertebrate animals. The importance of this habitat to invertebrates is not known. This vegetation type is fairly widespread on young lava flows in the Puna and South Hilo District.

4.22 RECOMMENDATIONS FOR VEGETATION

The vegetation between 0' and 2400' has general resource value only. Ordinary precautions should be taken to minimize soil erosion during construction and to revegetate the site.

Since the *'ohi'a/uluhe open forest* is a widespread vegetation type, the clearing and fragmentation that the proposed action would cause would not have significant adverse impact on any biological resource identified in this report. Reasonable efforts should be made to minimize the area of this vegetation type to be cleared.

4.3 ENDANGERED PLANTS

4.31 DISCUSSION

No plants listed, or proposed for listing, as threatened or endangered by the U.S. Fish and Wildlife Service were found within or near the proposed right-of-way, nor were any other plant species considered rare found. A review of the known distributions of listed or proposed endangered and threatened plant species revealed that none have ever been previously found within the project area. Based on the vegetation types found to be present and this review of known distributions, it is concluded that it is very improbable that any plant now listed or proposed for listing as endangered or threatened occurs within the project area.

4.32 RECOMMENDATIONS FOR ENDANGERED PLANTS

The absence of rare plants indicates that no precautions or mitigative efforts are required for the protection of such plants.

4.4 ENDANGERED ANIMALS

4.41 DISCUSSION

The only land mammal native to Hawaii is the Hawaiian Hoary Bat (Lasiurus cinereus semotus), which is a listed Endangered Species (Federal Register 1990a). No dawn or evening observations were made during the field survey; this study detected no bats within the project area. The Hawaiian Hoary Bat is well-known in the general Hilo area. It is possible that the Hawaiian Hoary Bat roosts or forages within the project area. The distribution and habits of this bat are poorly known. It is known to be widely distributed on the island of Hawaii and is known to be a solitary rooster that utilizes alien as well as native tree species. Being relatively in the type of habitat required for nesting and foraging, the Hawaiian Hoary Bat appears to be well-adapted to human-alterred landscapes (Tomich 1986).

The 'Io (Hawaiian Hawk: Buteo solitarius) is known to nest and forage in the Hilo area (Berger 1990) and almost certainly forages at times above the project area. However, no known vegetaion or other resource important to the 'Io is localized within the project site. The 'Io requires large trees for nest building (Griffin 1985). The 'ohi'a trees and other trees species within the project site do not grow above about 30 feet in height and, therefore, are not well-suited for nesting. Furthermore, all the plant species and community types within the project site are widely available within the surrounding region.

The Listed Threatened 'A'o, (Newell's Shearwater: Puffinus auricularis newelli) was reported in the upper Hilo area before 1980 (Conant 1980), but no recent sightings are known. The 'A'o was not observed during the field survey. Although the 'A'o can make use of dense uluhe mats within native vegetation as nesting sites, the project area is unlikely to be desirable nesting habitat because the proximity of homes ensures that domestic or feral cats roam the project area. The ground-nesting 'A'o is highly vulnerable to predation by rats and cats (HAS 1989).

It is possible that the 'A'o or the Listed Endangered 'Ua'u (Dark-Rumped Petrel: Pterodroma phaeopygia sandwicensis) fly above the project site when travelling between nesting grounds at higher elevations and the ocean where they feed. These night-flying seabirds are known to become confused by bright lights and to fly into obstacles such as buildings or utility wires and be injured or killed.

It is unlikely that any other endangered or threatened native bird species utilize the site. The elevation of the site (280 to 400 feet above sea level) is well below the elevation where endemic forest birds occur (Scott and Stone 1988).

4.42 RECOMMENDATIONS FOR ENDANGERED ANIMALS

In the unlikely event that construction crews encounter an 'I'o defending a nest with noisy calls, construction activity should be halted and the U.S. Fish and Wildlife Service contacted. If a nest is found within the project site, it should be left undisturbed until any 'I'o chicks have left the nest and the nest site has been abandoned.

Street lights should be shielded to prevent light shining upwards that might be harmful to Listed night-flying seabirds.

4.5 STREAMS AND WETLANDS

4.51 DISCUSSION

No streams were found within the project site. However, the proposed right-of-way does cross drainage areas above the headwaters of Alenaio Stream and a tributary of Waiakea Stream. Runoff from the construction and use of the Mohouli St. extension could affect aquatic life in these streams.

No permanent or semi-permanent pools that might support aquatic life were found within the proposed right-of-way. The only sites with standing water seen during the field survey are described in the following two paragraphs.

Distinct, poorly drained sites with clear wetland indicators were found within the proposed right-of-way between the 6100′ and 6500′ survey markers near Komohana St. A preliminary estimate of the extent of potential wetlands in this area is not more than 3000 sq. ft.

Strong indications of the presence of wetlands exist locally between the 400′ and 700′ markers. However, the lack of strong indicators of wetland soil makes the determination problematic. One inundated depression of not more han 2000 sq. ft. was found that may meet all criteria as a regulated wetland.

A preliminary survey showed that all other areas, between the 700′ and 6100′ foot markers lack either hydrophytic vegetation or hydric soil, essential criteria of regulated wetlands.

4.52 RECOMMENDATION FOR STREAMS

Careful attention should be given to erosion control during construction to prevent pollution of streams with watersheds in the project site (Alenaio and Waiakea Streams).

It is recommended that informal consultations with the appropriate personnel within U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers be initiated to seek concurrence with the finding that no streams traverse the project site and that the project would pose no direct threat to any aquatic organisms or ecosystem.

4.53 RECOMMENDATIONS FOR WETLANDS

It is recommended that informal consultations with the appropriate personnel within the U.S. Army Corps of Engineers be initiated to seek concurrence with the preliminary estimate of the extent of regulated wetlands within the project site. In consultation with the Corps of Engineers, a permit to construct the proposed roadway should be sought under the Nationwide Permit process.

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Table 1. Vascular plant species within the proposed right-of-way for the Mohouli St. Extension project area.
ORGN = Origin (E = endemic, I = indigenous, P= Polynesian introduction, A = other alien); LF = Life Form (T = tree, TF = tree fern, S = shrub, H = herb, G = grass or grass-like, F = fern, L = liana or vine); WET = Wetland Indicator Status from National List (FWS 1988) (OBL = Obligate, FW = Facultative Wetland, F = Facultative, FU = Facultative Upland, NI = Not Indicator). AREA = part of project site where found (1 = on 1881 lava flow, 2 = abandoned agricultural land) (D = Dominant, C = Common, F = Frrequent, I = Infrequent, L = Localized).

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	AREA 2
Abutilon grandifolium (Willd.) Sweet hairy abutilon	A	S	NI		I
Ageratum conyzoides L. maile-honohono	A	H	FU	I	
Andropogon virginicus L. broomsedge	A	G	FU	L	C
Archontophoenix alexandrae (F. v. Muell.) H. A. Wendl. & Drude Alexander palm	A	T	NI	C	L
Ardisia crenata Sims Hilo holly	A	S	NI	I	
Ardisia elliptica Thunb. shoebutton ardisia	A	S	FU	L	
Arundinia bambusifolia (Roxb.) Lindl. bamboo orchid	A	H	FU		C

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1 2
Blechnum occidentale L. blechnum	A	F	NI	I
Brachiaria mutica (Forsk.) Stapf California grass	A	G	FW	D
Buddleia asiatica Lour. butterfly bush	A	S	NI	I
Caesalpinia bonduc (L.) Roxb. kakalioa	I	S	FU	L
Centella asiatica (L.) Urb. Asiatic pennywort	A	H	F	I
Chamaecrista nicitans (L.) Moench partridge pea	A	H	NI	F
Citharexylum caudatum L. fiddlewood	A	T	NI	F
Coix lachryma-jobi L. Job's tears	A	G	FW	L
Commelina diffusa N. L. Burm. honohono	A	H	FW	L
Cordyline fruticosa (L.) A. Chev. ti, ki	P	S	NI	I

TABLE 1. (CONTINUED)

BOTANICAL NAME / COMMON NAME	ORGN	LF	WET	AREA 1	AREA 2
Crotolaria juncea L. sunn hemp	A	H	NI	I	
Cuphea carthagenensis (Jacq.) Macbride tarweed	A	H	F	L	
Desmodium sandwicense E. Mey. Spanish clover	A	H	FU	C	
Dicranopteris linearis (Burm.) Underw. uluhe, false staghorn	I	F	FU	L	D
Emilia sonchifolia (L.) DC Flora's paintbrush	A	H	NI	I	
Eriobotyra japonica (Thunb.) Lindl. loquat	A	T	NI	I	
Hibiscus furcellatus Desr. 'akiohala	I	S	F*	L	
Hyptis pectinata (L.) Poit. comb hyptis	A	S	NI	C	
Ipomoea indica (J. Burm.) Merr. morning glory	I	L	FU	I	
Kalanchoe pinnata (Lam.) Pers. airplant	A	H	NI	I	

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	AREA 2
Kyllinga nemoralis (J. R. Forst & G. Forst.) Dandy ex Hutchinson & Dalziel kili'o'opu	A	G	F	I	
Ludwigia octovalvis (Jacq.) Raven kamole, primrose willow	A	H	OBL	F	
Lygodium japonicum Sw. climbing fern	A	F	NI	I	
Machaerina angustifolia (Gaud.) T. Koyama 'uki	I	G	F		I
Machaerina mariscoides (Gaud.) J. Kern 'ahaniu	I	G	FU		I
Mangifera indica L. mango	A	T	FU		
Melastoma candidum D. Don melastoma	A	S	NI	D	C
Melinis minutiflora Beauv. molassesgrass	A	G	NI	C	
Melochia umbellata (Houtt.) Staph. melochia	A	T	NI	C	
Metrosideros polymorpha Gaud. var. incana 'ohi'a-lehua	E	T	F-		D

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	AREA 2
Microsorium scolopendria (Burm.) Copel. laua'e	I	F	NI	L	I
Mimosa pudica L. sensitive plant	A	S	FU	C	I
Myrica cerifera wax myrtle	A	T	NI	F	
Nephrolepis multiflora (Roxb.) Jarrett ex Morton swordfern	A	F	F	C	C
Ophioglossum pendulum L. adder's tongue	I	F	NI		I
Paederia scandens (Lour.) Merr. maile pilau	A	L	NI	C	
Pandanus tectorius S. Parkinson ex Z hala	I	T	F*	I	
Panicum repens L. wainaku grass	A	G	F+	D	
Paraserianthes falcataria (L.) Nielson albizia	A	T	NI	I	
Paspalum conjugatum Berg. Hilo grass	A	G	F+	F	

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	AREA 2
Paspalum scrobiculatum L. ricegrass	I	G	F*	F	
Paspalum urvillei Steud. vaseygrass	A	G	F	I	
Passiflora edulis Sims liliko'i	A	L	NI	I	
Passiflora suberosa L. huehue haole	A	L	NI	I	
Pennisetum purpureum Schumach. elephant grass	A	G	FU	L	
Phyllanthus debilis Klein ex Wild. niruri	A	H	NI	I	
Pleopeltis thunbergiana Kaulf. pakahakaha	I	F	NI		F
Pluchea symphytifolia (Mill.) Gillis sourbush	A	S	F*	F	
Polygala paniculata L. Milkwort	A	H	NI	F	
Psidium cattleianum Sabine waiawi, yellow strawberry guava	A	T	F	D	C
Psidium guajava L. common guava	A	T	FU	F	

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	 2
Psilotum nudum (L.) Griseb. moa	I	F	NI		F
Pycreus polystachyos (Rottb.) P. Beauv. no common name	I	G	F	I	
Rhodomyrtus tomentosa (DC)Rchb. Rose Myrtle	A	S	FU		I
Rhus sandwicensis Gray neneleau	E	T	NI	I	I
Rubus rosifolius Sm. thimbleberry	A	S	F-	C	
Saciolepis indica (L.) Chase Glenwoodgrass	A	G	F+	F	
Schinus terebinthifolius Raddi christmasberry	A	T	FU	I	
Schizachyrium condensatum (Kunth) Nees little bluestem	A	G	NI		L
Scleria testacea Nees nutgrass	I	G	FU	L	
Setaria palmifolia (Koen.) Stapf palmgrass	A	G	FU	F	
Shefflera actinophylla (Endl.) Harms octopus tree	A	T	NI	I	F

TABLE 1. (CONTINUED)

BOTANICAL NAME COMMON NAME	ORGN	LF	WET	AREA 1	 2
Spathodea campanulata Beauv. African tulip tree	A	T	NI	C	
Spathoglottis plicata Blume Philippine ground orchid	A	H	F+	I	I
Sphenomeris chusana (L.) Copel. palaa, lace fern	A	F	F	I	
Spermacoce assurgens Ruiz & Pav. buttonweed	A	H	F	I	
Stachytarpheta urticifolia (Salisb.) Sims no common name	A	S	F*	C	
Styphelia tameiameiae (Cham.) F. Muell. pukiawe	E	T	NI		I
Syzigium cumini (L.) Skeels Java plum	A	T	FU		L
Trema orientalis (L.) Bl. gunpowder tree	A	T	NI	C	I
Waltheria indica L. uhaloa	I	S	NI	F	
Wedelia trilobata (L.) Hitchc. wedelia	A	H	FU	C	

APPENDIX A

ATTACHMENT Letter of comment from the U.S. Fish and Wildlife Service in response to the Notice of Intent to prepare an Environmental Assessment for the Mohouli St. Extension.

96003

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

RECEIVED
MAR 28 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

In Reply Refer To: TR

MAR 26 1996
COPY
ORIGINAL FILED
IN ....

Mr. Bruce K. Meyers, P.E.
Okahara & Associates, Inc.
200 Kohola St.
Hilo, HI 96720

Re: Notice of Intent to Prepare an Environmental Assessment for Mohouli Street Extension.

Dear Mr. Meyers:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Intent (NOI) to prepare an Environmental Assessment (EA) for Mohouli Street Extension. The purpose of the project is to provide a direct link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas. The project sponsors are the Federal Highway Administration and the County of Hawaii Department of Public Works. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The proposed project would traverse a lowland ohia forest that may support native species of plants, birds and invertebrates. The proposed project route may also pass over subterranean lava tube systems. The Service recommends that the draft EA address project-related impacts to fish and wildlife resources and habitats along the project route, particularly impacts on endangered and threatened species and migratory fish and birds.

The federally listed Hawaiian hawk (*Buteo solitarius*), dark-rumped petrel (*Pterodrama phaeopygia sandwichensis*), Newell's shearwater (*Puffinus auricularis*), and the Hawaiian hoary bat (*Lasiurus cinereus semotus)* may occur within the vicinity of the project site or traverse the area. It is unlikely that the Hawaiian hoary bat will be impacted by the proposed project. However, the Hawaiian hawk may nest or roost in the area and may be impacted by forest clearing. The Service is also concerned that the proposed street lighting system may attract listed seabirds. Seabirds, especially young birds leaving interior mountain nest sites for the first time, are attracted to bright lights. They may become blinded and disoriented and fly into unseen objects such as utility wires, buildings, and other urban structures. This phenomena is known as seabird "fallout" and occurs most frequently between October and November each year. The Service recommends that the draft EA address the impact of forest clearing on the Hawaiian hawk, as well as the impact of the street lighting on seabirds.

The Service also recommends that the draft EA consider alternate alignments or other measures that would avoid or minimize impacts to any cave systems and any aquatic resources that may be associated with Alenaio Stream. We suggest that Alenaio stream be surveyed for the presence of permanent pools. If the stream has permanent pools, the proposed project area may contain Pacific megalagrion damselfly (*Megalagrion pacificum)* and orangeback megalagrion damselfly (*Megalagrion xanthomelas*) (both candidates for listing), as well as native amphidromous fish and crustaceans.

Finally, the Service has also reviewed maps prepared by the Hawaii Heritage Program of the Nature Conservancy. These maps show historical records of endangered, threatened or proposed endangered species in the vicinity of the proposed corridor including one species of bird, *Psittirostra psittacea* (possibly extinct), and four species of plants: *Adenophorus periens, Asplenium fragile* var. *insulare, Cyanea platyphylla,* and *Stenogyne angustifolia.* Records of species of concern in the vicinity of the project area include historic records of nine species of plants: *Botrychium subbifoliatum* (possibly extinct), *Cyanea tritomantha, Joinvillea ascendens* ssp. *ascendens, Lindsaea repens* var. *macraeana, Phyllostegia brevidens, Phyllostegia floribunda, Phyllostegia vestita, Thelypteris boydiae, Torulinium odoratum* ssp. *auriculatum* and a current record of one species of insect, *Pentarthrum obscurum.* While species of concern are not currently federally protected, they may be added to the Endangered Species List in the future. It is unlikely that any of the above species are present in the proposed project area, with the exception of *Pentarthrum obscurum.* However, the Service recommends that the proposed road realignment be surveyed to confirm that no rare flora or fauna will be impacted by the project.

The Service appreciates the opportunity to provide comments on the NOI, and we look forward to receiving a copy of the draft EA for review. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Tanya Rubenstein at 808/541-3441.

Sincerely,

Acting Karen Evans

Brooks Harper
Field Supervisor
Ecological Services

cc: USGS, Honolulu
EPA-Region IX, San Francisco
DOT, Honolulu
DPW, Hilo, Hawaii County

ADDENDUM TO THE FLORA AND FAUNA REPORT
FOR
MOHOULI ST. EXTENSION

PREPARED BY:

Grant Gerrish, Ph.D.

And

Okahara and Associates
200 Kohola St.
Hilo, Hawaii 96720

February 1, 1998

PURPOSE OF THIS ADDENDUM

This is an addendum to the "Flora and Fauna Report for Mohouli St. Extension," prepared by Grant Gerrish and Y.K. Hahn and Associates, April 25, 1996. That original flora and fauna report as well as this addendum support an Environmental Assessment for the proposed street extension. Engineering and design considerations associated with drainage needs require expansion of the proposed Mohouli Street Extension study area. This addendum reports the field survey and analysis of the biological and wetland characteristics of this expanded area needed for drainage.

EXPANDED STUDY AREA

The study has been was expanded on both sides of the proposed right-of-way. Between survey stations 14+00 and 25+00 on the right side (southwest), the study area has been expanded from 100 feet (31 m) from the surveyed centerline to 150 (46 m) feet from the centerline. This is an extent of 1100 feet (339 m).

On the left side (northeast), the area of expansion is between survey stations 15+00 and 25+00, an extent of 1000 feet (308 m). Previously, the study area extended 100 feet from the centerline. The width of the new expansion is variable. Between survey stations 15+00 and 17+50 the new width is 225 feet (69 m). Between 17+50 and 20+00, the new width is 250 feet (77 m). Between 20+00 and 22+00, the new width is 325 feet (100 m). Between 22+00 and 25+00, the new width is 250 feet.

METHODS

The expanded study area was revisited for pedestrian biological surveys on January 23 and 30, 1998. Methods were in accordance with those used in the original flora and fauna study cited above. Additionally, a line-intercept transect was run through areas containing wetland habitat. The extent of the transect intercepting each vegetation type was recorded and converted to a percent of total transect. The area of each vegetation type was then estimated, by multiplying total area by the vegetation type percent. The transect was established and measured using tape measures and a hand-held GPS receiver.

Wetland determinations were made in accordance with the US Army Corps of Engineers Wetlands Delineation Manual (USACE 1987).

FINDINGS

VEGETATION AND FLORA

In general, the vegetation of the expanded study area was very similar to the descriptions of the original flora and fauna study given in Section 3.212.

An extent of about 200 feet (62 m) at the southeastern end of the expanded area is on the 1881 lava flow, with a native vegetation dominated by 'ohi'a-lehua (Metrosideros polymorpha) and uluhe (Dicranopteris linearis). Alien plants are also present in this area.

The remainder of the expanded study area is within a secondary vegetation on abandoned sugarcane fields. On the right side of the right-of-way centerline, the expanded area consists mostly of thickets of waiawi (Psidium cattleianum) as described in the original report. On the left side, the expanded area is a heterogenous mix of thickets of alien trees and grassy openings, the latter dominated by Wainaku grass (Panicum repens).

Only one additional plant species was encountered during the new surveys, Rhynchospora caduca, an alien rush.

FAUNA

The fauna of the area was described in Sections 3.3 and 4.41 of the original report. The fauna of the expanded area appears to be similar to that describe in the original report. On the January 30 field survey, a pair of 'Io (Hawaiian Hawk: Buteo solitarius) was observed flying above the project area.

WETLAND CONDITIONS

The expanded study area is located within the flood zone of Alenaio Stream, as described in Section 3.41 of the original report. No intermittent or permanent streams cross the study area; however, it is well known that during periods of intense rainfall surface flow crosses the proposed right-of-way between the 16+00 and 24+00 survey stations. Erosional features, including short sections of shallow gullies or swales, give evidence of this flow. Nearly all sections of these gullies and swales are vegetated, lacking high water marks. The swales are typically several meters wide, no more than one meter lower than the surrounding surface, and occurring in disconnected sections less than 30 meters long. The original study found the vegetation to be not hydrophytic and the soils to be well-drained.

On the left side of the centerline, the expanded study area contains a few areas of jurisdictional wetlands, based on the plant, soil and hydrological indicators required by the Delineation Manual (USACE 1987). A single water-hole measuring about 15 by 4 feet (4.6 by 1.2 m) with open water was found in a swale. This water-hole was mostly vegetated by submerged Wainaku grass. Tracks of birds and small mammals were found in mud and the water teamed with tadpoles and insects. No damselflies were seen at the time of encounter, about 4:00 PM.

Areas vegetated by thickets or more open woodland cover were found to not contain wetlands. The vegetation is not hydrophytic and the soil well-drained. Wetlands were found in swales in some grassy openings dominated by Wainaku Grass. Not all the openings contain jurisdictional wetlands. Openings with scattered trees lack hydrophytic vegetation and appear to lack indicators of hydric soils. Some other openings lack hydric soil indicators.

Several of the swales were found to include at least some areas that meet all three criteria as jurisdictional wetlands. Their vegetation is hydrophytic by virtue of the dominance of Wainaku Grass and the soils were saturated with hydric indicators including sulfidic smell, low chroma and lack of structure. An 882-foot (271 m) transect through this area found that about 25% of the area is occupied by Wainaku Grass-dominated openings. However, those openings that contained strong indicators of wetlands conditions comprised only 3.4% of the transect. Strong indicators found include presence of kamole (Ludwigia octovalis), an obligate wetland plant, surface soil saturated with water, sulfidic smell or low chroma soil.

The total study area on the northeast side of the centerline between survey station 15+00 and the 1881 lava flow (which lacks any evidence of wetland conditions) was calculated to be 208,750 square feet (19763 square m). The area of jurisdictional wetland within this portion of the study area is calculated to be 3.4% times 208,750 square feet, or 7,098 square feet (672 square meters).

RECOMMENDATIONS

FLORA AND FAUNA GENERAL RESOURCE VALUES

The flora and fauna of the expanded study is considered to have general resource value as described in Section 4.1 of the original report. No other resource values of the biological resources were discovered. Recommendations are the same as given in Section 4.22 of the original report.

ENDANGERED SPECIES

No endangered plants were found in the expanded study area.

A pair of endangered 'Io was seen, confirming the assumptions that this species does utilize the general area. A single small waterhole was found within the expanded study area that may be utilized as a water source by the fauna, including mammal and bird prey species of the 'Io. The significance of this resource to the 'Io is not known.

Recommendations for endangered species are the same as those given in Sections 4.32 and 4.42 of the original report.

WETLANDS

It is estimated that the expanded study area includes 7,098 square feet of jurisdictional wetlands not enumerated in the original report.

Few native plant species occur in the vicinity of these wetland areas. Significance of these wetland areas to any native plants or animals is probably low.

Although the movement of water in this area is not well understood, hydrologically, this area is part of a drainage pattern of some importance during heavy rainfall. The proposed roadway is designed not to interfere with the existing drainage pattern.

The expanded study area would be uniformly graded to provide sufficient slope for drainage away from the roadway. This graded area may revert to the semi-natural wetland conditions, mitigating the proposed loss of wetlands that now occur within portions of the site. As described in Section 4.21 of the original report, level, graded areas have developed at least some wetland characteristics. A grading design and management plan that allows the graded area to be revegetated would probably allow extensive redevelopment of wetlands similar to those now presence.

Based on the original flora and fauna report and other information, the U.S. Army Corps of Engineers acknowledged that the proposed construction of the Mohouli Street extension was provisionally authorized under Nationwide Permit #26. This authorization was based on the representation that fill of wetlands would be not more than 3,000 square feet. The findings of this expanded study are that an additional estimated 7,098 square feet of wetlands would be filled (graded).

It is recommended that construction within the entire proposed drainage area conform with the conditions enumerated in the Permit Letter of September 9, 1996, from the U.S. Army Corps of Engineers.

REFERENCE

USACE. 1987. Corps of Engineers Wetlands Delineation Manual. US Corps of Engineers, Washington, DC.

MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

APPENDIX 5

PUBLIC INVOLVEMENT

1. Record of Pre-Environmental Assessment Meetings
2. Comments in Response to Pre-Consultation
3. Public Hearing Notice for October 8, 1997 Meeting
4. Newspaper Article, Hawaii Tribune Herald, October 5, 1997
5. Agenda for Hearing
6. Sign-In Sheet/EEO Report
7. Transcripts of Public Hearing
8. Summary of Issues/Responses
9. Comment Letters/Responses to the EA

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

1. Record of Pre-Environmental Assessment Meetings

Okahara & Associates, Inc.
ENGINEERING CONSULTANTS

MEETING TO DISCUSS
MOHOULI STREET EXTENSION

DATE/TIME: Tuesday, May 28, 1996, 7:00 PM
PLACE: UH-Hilo Campus Center, Room 313
SPONSORS: Y.K. Hahn & Associates and William L. Moore Planning

---

You are cordially invited to a meeting of your neighborhood residents to discuss the proposed Mohouli Street Extension.

The County of Hawaii proposes to extend Mohouli Street between Komohana Street and Kaumana Drive in Hilo. The extension, which is part of the Hawaii County General Plan adopted in 1987, will provide a useful link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas.

Funding for the project construction is estimated at $4.85 million and would be derived from federal match funds. If necessary approvals are obtained, the project would begin construction in mid-1997 and would last approximately 12 months.

The firm of Y.K. Hahn and Associates has been sub-contracted to prepare an Environmental Assessment (EA) in compliance with Chapter 343, HRS, and the federal National Environmental Policy Act (NEPA). Members of your community are invited to discuss the project with planners and environmental scientists involved in the EA. This meeting is an important way to share information about the project and its impacts.

If you have any questions regarding the scheduling of meeting, please call Joy Nakamoto at 961-5527.

Letter No. 44970

Donald K. Okahara, P.E. • Masahiro Nishida, P.E. • Terrance Nago, P.E. • Glenn Suzuki, P.E. • Nancy E. Burns, P.E.
200 KOHOLA ST. • HILO, HI 96720 • (808) 961-5527 • FAX (808) 961-5529
470 NORTH NIMITZ HWY., STE. 212 • HONOLULU, HI 96817 • (808) 524-1224 • FAX (808) 521-3151
73-5574 MAIAU STREET, BAY 6B • KAILUA-KONA, HI 96740 • (808) 329-1221 • FAX (808) 329-1006

MEETING TO DISCUSS
MOHOULI STREET EXTENSION

DATE/TIME:	Wednesday, May 29, 7:00 PM
PLACE:	UH-Hilo Campus Center, Room 313
SPONSORS:	Y.K. Hahn & Associates and William L. Moore Planning

You are cordially invited to a meeting of your neighborhood residents to discuss the proposed Mohouli Street Extension.

The County of Hawaii proposes to extend Mohouli Street between Komohana Street and Kaumana Drive in Hilo. The extension, which is part of the Hawaii County General Plan adopted in 1987, will provide a useful link between the growing Kaumana area and Komohana Street, which connects to the University and major shopping areas.

Funding for project construction is estimated at $4.85 million and would be derived from federal match funds. If necessary approvals are obtained, the project would begin construction in mid-1997 and would last approximately 12 months.

The firm of Y.K. Hahn and Associates has been contracted to prepare an Environmental Assessment (EA) in compliance with Chapter 343, HRS, and the federal National Environmental Policy Act (NEPA). Members of your community are invited to discuss the project with planners and environmental scientists involved in the EA. This meeting is an important way to share information about the project and its impacts.

Mohouli St. Extension Sign-In

28 MAY 1996

	Name	Address (opt)	Phone (opt)
1	Fred Dietma	1983 KALANIANAOLE.	969-9381
2	Galen Macaraas/Michele Paiva	177 Uluwai St.	935-3304
3	Bob & Pauline Okinaka	182 Uluwn'i St	9359957
4	Ron Terry	Y.K. Ikhe Associates	982-5831
5	Bruce Meyers	Okahara & ~~Assoc~~.	961-5527
6	Cindy Hoota	850 Kukuau St.	935-3006
7			
8			
9			
10			

29 May 1996

1	Mac & Lisa Cooper	305 Mohouli St.	961-9000
2			
3			
4			
5			
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7			
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10			

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

2. Comments in Response to Pre-Consultation

BRIAN J. DE LIMA
Vice-Chairman

COUNTY COUNCIL
County of Hawaii
Hawaii County Building
25 Aupuni Street
Hilo, Hawaii 96720

Phone: (808) 961-8261
Fax: (808) 969-3291

RECEIVED
MAR 01 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

February 26, 1996

Mr. Bruce Myers. P.E.
Project Engineer
200 Kohola Street
Hilo, HI 96720

Dear Mr. Myers:

Thank you for letter dated February 16, 1996 related to the Environmental Assessment for the Mohouli Street Extension. Your letter listed the most important areas that need to be considered in the Environmental Assessment and I am satisfied with that list. I am very supportive of this project and look forward to its completion. If I can do anything to facilitate the expedition of its construction, please feel free to call on me.

Thank you again for your letter. Should you have any questions or concerns, please do not hesitate to contact my office at 961-8261.

Sincerely,

Brian J De Lima, Chairman
Committee on Human Services and Public Works

COPY
ORIGINAL FILED
IN ....

Stephen K. Yamashiro
Mayor

Wayne G. Carvalho
Police Chief

James S. Correa
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2702

February 26, 1996

Mr. Bruce K. Meyers
Project Engineer
Okahara & Associates, Inc.
200 Kohola Street
Hilo, Hawaii

Dear Mr. Meyers:

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR MOHOULI STREET EXTENSION

In conjunction with this project, the County may be able to determine who should be responsible for the improvements and signalization of the Komohana/Kukuau intersection as well. This will assure a more balanced flow of traffic along Komohana, especially at peak traffic periods.

The only other concern we have is that the Mohouli extension will likely result in higher average vehicle speeds than residents of the contiguous Sunrise Estates may be accustomed to.

We anticipate complaints from adjoining residents about the traffic, dust, and noise that will be generated during the project.

We would appreciate a copy of the Draft EA when it is completed.

Sincerely,

Wayne G. Carvalho

WAYNE G. CARVALHO
POLICE CHIEF

EO:esk/lk

COPY
ORIGINAL FILED
IN 96003

RECEIVED
FEB 29 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

Stephen K. Yamashiro
Mayor

Harry Kim
Administrator

Bruce D. Butts
Assistant Administrator

County of Hawaii
CIVIL DEFENSE AGENCY
920 Ululani Street • Hilo, Hawaii 96720
(808) 935-0031 • Fax (808) 935-6460

February 21, 1996

Bruce K. Meyers, P.E.
Okahara & Associates, Inc.
200 Kohola Street
Hilo, HI 96720

ENVIRONMENTAL ASSESSMENT FOR MOHOULI STREET EXTENSION
LETTER NO. 44527, REFERENCE NO. 96003

The proposed extension crosses over areas of flooding concerns during heavy rains.

It is extremely critical that the proposed extension does not add to the runoffs between Komohana Street and Kapiolani Street. This area is already past maximum load during heavy rains and have caused major damages to homes between Komohana and Kapiolani Streets. The present Alenaio flood project does not address this issue.

This agency would like to receive a copy of the draft environmental assessment.

Harry Kim

HARRY KIM, ADMINISTRATOR

dy

0334P

RECEIVED
FEB 26 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

COPY
ORIGINAL FILED
IN 96CC:2

96003

Stephen K. Yamashiro
Mayor

Virginia Goldstein
Director

Norman Olesen
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-9615

September 24, 1996

RECEIVED
OCT - 2 1996
OKAHARA & ASSOC., INC.
HILO OFFICE

Mr. Bruce K. Meyers, P.E., Project Engineer
Okahara & Associates, Inc.
200 Kohola Street
Hilo, HI 96720

Dear Mr. Meyers:

Request for Comments Re: Special Environmental Conditions or Impacts Related to Mohouli Street Extension Preparation of HRS 343 Environmental Assessment

The following comments are made concerning the environmental conditions or impacts of the Mohouli Street Extension (MSE). We apologize for the delay in responding to your request.

1. Land Use Designations - Zonings. According to the department's zoning tax maps, the street extension will be located across the following Tax Map Key parcels, from Mohouli Street in a westerly direction mauka to Kaumana Drive connecting with Ainako Street.

TMK	County Zoning	State Land Use (SLU)	
2-4-01: 122	A-1ac.	"Agricultural"	(319.205 acs.) Waiakea Cane Lots, So. Hilo
2-4-08: 26	A-1a	"A"	(193.451 acs.) Por. Panaewa, Upper Waiakea & Waiakea F.R., So. Hilo
2-5-06: 01	A-1a	"A"	(59.143 acs.) Pors. Ponahawai, Kaumana, Kukuau, So. Hilo
2-3-44: 09	A-1a & Open	"Urban"	(218.6308 acs.) Ponahawai, So. Hilo

General Plan Designations: Urban Expansion, Low Density, and Flood Plain. The proposed street extension goes across and will be within the above land use designations of the HI County General Plan, according to the LUPAG (Land Use Pattern Allocation Guide) Map - Hawaii County General Plan and are defined as follows:

"...*Low Density:* Single family residential in character, ancillary community and public uses, and convenience type commercial uses...
Urban Expansion: Allows for a mix of high..., medium..., and low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined. Within areas designated for development as resorts,...."

2. County General Plan Transportation Goals, Policies, Standards - Thoroughfares & Streets. The GP *transportation* and *thoroughfares and streets goals* seeks provision for a transportation system or a system of thoroughfares and streets for people and goods to move efficiently, safely, comfortably and economically within various sections of the county. GP sec. 4.L. & (1) at 12 - 13. The MSE connection to Ainako Street is consistent with these goals because it will add to the City of Hilo's transportation, thoroughfares and streets traffic circulation system by providing another mauka-makai arterial access route; presently, mauka traffic users are limited to Kaumana Drive and Waianuenue Avenue. Moreover, the mauka-makai routes of the drive and the avenue merges into Waianuenue Avenue creating a funnel effect that increases the congestion of mauka traffic into Hilo. An additional arterial connection will provide another route for travel from Hilo's mauka residential sections to the city's makai routes and destinations and vice versa; and hopefully, relieving the traffic congestion along Kaumana Drive into Waianuenue Avenue.

   The MSE mauka arterial street extension is also consistent with the GP's transportation policy to provide for present traffic and future demands for high growth areas, like Hilo's mauka residential sections along Kaumana Drive.

3. MSE is Consistent with South Hilo Courses of Actions: Transportation. The MSE is consistent with the GP Courses of Actions. The GP's Course of Action are actions necessary to promote the policies, development objectives, standards and principles of the transportation - thoroughfares and streets element within the South Hilo district, for example. The South Hilo transportation Course of Action states that Ainako should extend across Kaumana Drive to meet the Mohouli extension to provide one of the major mauka cross-city connections. GP sec. 5.B.8(a) at 26. The proposed MSE is intended to accomplish the GP's Course of Action and function as a major arterial connection for the

mauka subdivisions into the city's traffic circulation system. The MSE's mauka route is documented on the South Hilo District Facilities Map - Hawaii County General Plan, Ordinance 439 (Approved 12/22/71).

Any clarification or discussion of the above comments can be made with Daryn Arai or Earl Lucero, telephone: 961-8288.

Sincerely,

Sidney K. Nakano

VIRGINIA GOLDSTEIN
Planning Director

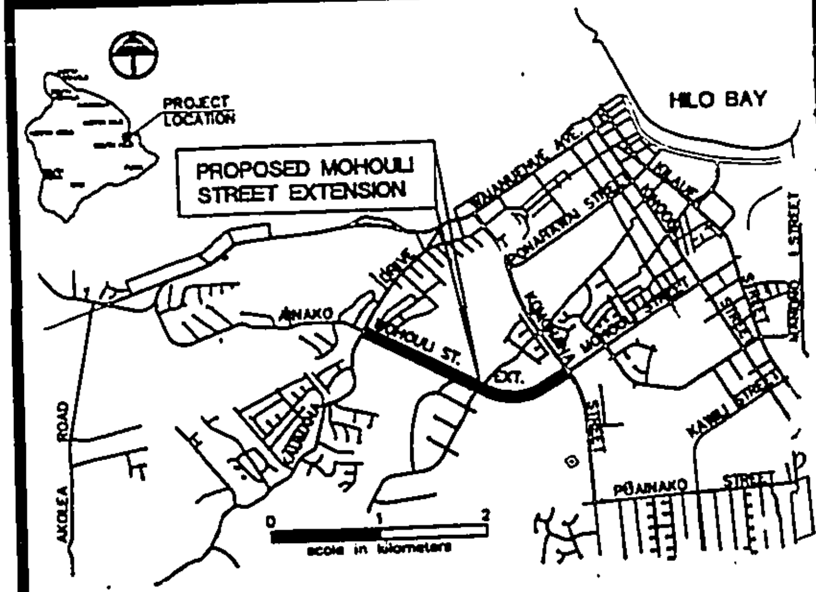
EML:pak
F:\WP60\Earl\Letters\LMEYER01.EML

cc: SMA Section

**MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT**

PUBLIC INVOLVEMENT APPENDIX

3. Public Hearing Notices for October 8, 1997 Meeting



NOTICE OF PUBLIC HEARING

Notice is given that the Hawaii County Department of Public Works in cooperation with the State Department of Transportation and the Federal Highway Administration will hold a public hearing on October 8, 1997, at 6:30 p.m., at the Edith Kanakaole Hall (EKH) Room 128, University of Hawaii at Hilo, 200 W. Kawili Street, Hilo, Hawaii. The purpose of the hearing is to receive evidence and testimony relating to the proposed Mohouli Street Extension project, which would extend Mohouli Street in Hilo 2.13 km between Komohana Street and Kaumana Drive.

The Country of Hawaii will discuss the project alternatives, environmental effects, relocation assistance programs and tentative schedules for right-of-way acquisition and construction. Interested persons with testimony on the social, economic or environmental impact of any of the alternatives are invited to be heard. Persons unable or not desiring to appear at the hearing may file signed statements presenting their views on the project. Such statements should be submitted on or before October 23,1997, and should be addressed to the Chief Engineer, Hawaii County Department of Public Works, 25 Aupuni Street, Hilo, Hawaii 96720.

Maps, drawings and other pertinent information including written comments received as a result of coordination with other governmental agencies are available for inspection at the following location:

Hawaii County Department of Public Works,
25 Aupuni Street
Hilo, Hawaii 96720

Notice is also given that the Environmental Assessment (EA) for the proposed Mohouli Street Extension is available for public review and copying at the following locations:

U.S. Department of Transportation
Federal Highway Administration
Highway Division
Room 3202
300 Ala Moana Boulevard
Honolulu, Hawaii

Hawaii State Department of Transportation
Highways Division
Planning Branch
600 Kapiolani Street, Room 301
Honolulu, Hawaii

Hawaii State Department of Transportation
Highways Division, Hawaii District
50 Makaala Street
Hilo, Hawaii

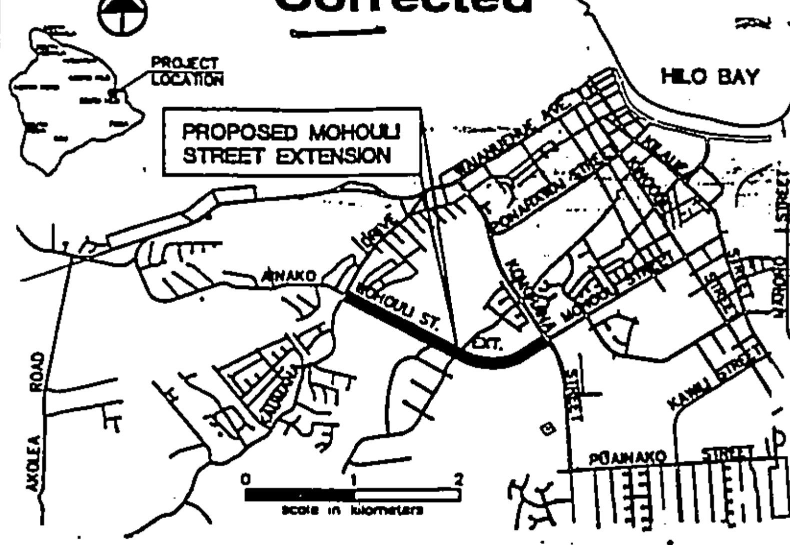
Hawaii County Department of Public Works
25 Aupuni Street
Hilo, Hawaii

Hilo Public Library
300 Waianuenue Avenue
Hilo, Hawaii

Donna Fay Kiyosaki
Chief Engineer

(090625–Hawaii Tribune-Herald: September 23, 30, 1997

Corrected



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Hawaii State Department of Transportation
Highways Division, Hawaii District
50 Makaala Street
Hilo, Hawaii

Hawaii County Department of Public Works
25 Aupuni Street
Hilo, Hawaii

Hilo Public Library
300 Waianuenue Avenue
Hilo, Hawaii

Donna Fay Kiyosaki
Chief Engineer

(090625–Hawaii Tribune-Herald: September 23, 30, 1997

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

4. Newspaper Article, Hawaii Tribune Herald, October 5, 1997

Hawaii Tribune Herald
October 5, 1997

EIS: Work on Mohouli road extension could start in '98

By Kevin Dayton
Tribune-Herald

Construction on the long-planned Mohouli Street extension from Komohana Street to Kaumana Drive at Ainako Avenue may begin as early as mid-1998, according to a new report on the project.

The extension, which is expected to cost more than $7.6 million, would cut through the growing Sunrise Ridge neighborhood.

State and federal officials plan to condemn and buy pieces of four properties there for the roadway, according to the environmental assessment for the project.

The environmental assessment indicated that "no relocation of residences, businesses, community organizations or farms would occur because of the project."

See PROJECT, Page 8

PROJECT

From Page 1

The area where the road will pass is mostly owned by the state, although the road will cut through two privately owned parcels.

All of the land involved is "vacant or not fully utilized," according to the report.

Construction is expected to last about a year.

The 1.3 mile roadway extension is expected to ease traffic congestion at the busy intersection of Komohana Street and Wainuenue Avenue.

It is also expected to cut down sharply on traffic on Punahele Street.

On the other hand, the project is expected to boost traffic on the existing segment of Mohouli Street by about 50 percent, and will also make Ainako Avenue and Ponahawai Street a bit busier, according to the report.

To help cope with the extra traffic, Ainako would be widened between Kaumana Drive and Uluwai Street as part of the project.

The environmental assessment predicts air quality will generally improve with the project as there is less congestion and stopped traffic in the area.

What's next

What: Public hearing on the planned Mohouli Street Extension project

When: 6:30 p.m. Wednesday

Where: University of Hawaii at Hilo's Edith Kanakaole Hall, 200 W. Kawili St., Room 128

Why: The hearing will give the public a chance to testify on the project, and will allow county officials to discuss alternatives, environmental effects, relocation assistance programs and the tentative schedules for obtaining land for the project

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

5. Agenda for Hearing

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

OCTOBER 8, 1997
UNIVERSITY OF HAWAII AT HILO,
EDITH KANAKAOLE HALL, ROOM 128

AGENDA

1. Opening Remarks and Introductions

2. Project Description

3. Environmental Assessment Process

4. Open Session

    Viewing Exhibits
    One-on-one Questions for Team Members
    Testimony
    Submission of Written Testimony

5. Public Question and Answers, Testimony

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

6. Sign-In Sheet/EEO Report

MOHOULI STREET EXTENSION
PUBLIC HEARING

DATE: October 8, 1997
TIME/PLACE: 6:30 PM - UH-Hilo EKH 128

SIGN-IN SHEET

NAME (please print)	GROUP (if applicable)	PHONE (optional)
Clint & Pauline Okinaka		9359957 H
Irene Ozaki	Univ. Hts. Comm. Assoc.	9356207
Howard Pereira		
Carrn Komura		9694148
Lincoln Fujimori		961-6623
Thomas Pyenta		935-2770
[illegible] Pyenta		935-4122
John Nakashima		"
GALEN KUBA		
RZADA KUJIMOTO		
Don & Cindy Hoota		935-3006
LISA & MAC COOPER		
Wilbert Shimabukuro		9355401
Hugh Clark		935-3916
DIANE SAITO		
[illegible] YAMADA		961-6108
NEWTON J. CHU	P.A.T.H.	961-0406
DONNA KIYOSAWA		

CIVIL RIGHTS REPORT OF PUBLIC PARTICIPATION

A (Check one) ✓ Public Hearing

_____ Informational Meeting

was held (Date) 10-8-97

at (Time) 6:30 pm

at (Place) University of Hawaii
EKH Room 128

for (subject, include project number if appropriate) Mohouli Street Extension

Those attending were approximately:
(If unsure make a guess)

	M	F
Black		
American Indian		
Japanese	13	5
Chinese	1	
Korean		
Filipino		
Hawaiian and part Hawaiian		
Puerto Rican		
Samoan		
Caucasian	5	4
Other		

Remarks:

By: A. Nakamoto Date: 10-8-97

Route completed form to EEO Coordinator.

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

7. Transcripts of Public Hearing

Mohouli Street Extension
Public Hearing
October 8, 1997

Donna Kiyosaki (DK): First of all I'd like to thank all of you for showing up tonight. I know that you're all busy and you're taking time from your schedules to be here and I just want to let you know that we really appreciate it. We're here tonight to talk about the proposed Mohouli Street extension. This is a project that is going to run from the intersection of *Komohana and Mohouli Street to the intersection of Kaumana* and Ainako and that's a distance of about 2.13 kilometers. I have a difficult time thinking in kilometers, so to me that's about one-and-a-quarter miles, for those of us that don't think in meters. We are here tonight, basically we're in the environmental assessment process. Our consultants have done an environmental assessment. We want to receive whatever input we can from you here tonight and we're very interested in hearing what your concerns, thoughts are about the project and we will be considering all the testimony that we receive tonight and we want to let you know that it's very important to us. We want this to be a community project. We want all of you to be able to freely speak on it and we hope that you feel free to do that tonight. First of all, let me introduce some of the County people that we have here tonight. Our Engineering Division chief is Mr. Galen Kuba and he's in the University Heights subdivision so he becomes affected somewhat by this project also, and our Project Engineer is Mr. Ben Ishii and he's in our Engineering Division, and I'd like to thank both of them for showing up tonight. Right now I'm going to turn it over to the representative from our prime consultant. Our consultant on the project is Okahara and Associates. They've been working on the environmental assessment together with their subconsultant and here tonight from Okahara is Mr. Bruce Meyers, and I'll turn it over to Bruce right now. Thank you.

Bruce K. Meyers (BKM): Thank you. What I'd like to do is first of all maybe briefly go through the design of the extension and--well, I'll tell you what I'll do first is introduce the gals over here on the left as Joy and Ethel. They're from Okahara as well. They helped us with the refreshments and are taking the notes tonight. So, we thank them for helping us tonight. As Donna mentioned, the roadway extends from Mohouli and Komohana intersection all the way up to the Kaumana-Ainako intersection; most of you probably know that better than I do. Seems that this project was in the making for years. I was probably this high when this thing was first introduced. This is a typical right-of-way, I mean, typical cross sections of road. As you see we have two 12-foot travel lanes, 8-foot shoulders on both sides, and then paved swales. The right of way itself is 80 feet but the prism, the roadway prism--what we call the roadway prism--will be for 60 feet. We will be crossing Kukuau Street. This is Kukuau, right here. We'll be crossing Kukuau at this point and then coming to the Komohana-Mohouli Street intersection. That's just a brief rundown. We will improve the intersections here at the Kaumana-Ainako intersections. As you know, now they have the lights, they're working on improving the lighting there, traffic lighting--signals--and we will be modifying that a little bit as well. There will be no, at this time, traffic signals here at this intersection (pointing to the Komohana-Kukuau intersection) and then we'll modify the Mohouli-Komohana intersection, the light that's there now. That is just a brief rundown of the project. We'll get into a bit more detail as the evening goes on. At this time I'd like to introduce Ron Terry, who is with Y. K. Hahn and Associates who did the environmental assessment. And without further ado I'll turn it over to him.

Ron Terry (RT): That is Y. K. Hahn, here. Thank you all for coming. We're conducting, as Donna Kiyosaki said, an environmental assessment. Environmental assessment is required by both State and Federal law for any project of this magnitude. What we try to do in an environmental assessment is look at all the impacts of a project and propose mitigation measures or things that can help alleviate these impacts so that they're not bad or maybe they're even beneficial. We also determine in an environmental assessment if there are significant impacts, very severe impacts, that would require a larger, more detailed document to be prepared, an environmental impact statement, or EIS--you all probably heard that term before--and that's what we're in the process of doing right now. Because we have Federal funds for this project, we have both a Federal and a State environmental assessment going on; they're going on at the same time. Because it's a Federal process, we had to put notices in the paper that some of you may have seen, public, legal advertising; some of you may have seen this through our--we had a front page story in the Tribune-Herald on Sunday, and we've also mailed out a number of notices to community associations, to agencies, affected groups, the Sierra Club, the University, etc., etc., to try to get the broadest possible participation. Now, this is a hearing that we are having tonight, and therefore everything that we're saying up here is being recorded. Not very well--our primary system, we can't figure out how to work. If we got an audio-visual expert, we'd love to have you come up and fix it for us...so we're using a little old back-up tape recorder here. You'll have to excuse us. It's a little crude, but it'll do our purposes. We're also having notes taken here. We--the way we're going to do the meeting tonight is a brief introduction, and we're two-thirds of the way through that, and then we're going to pause again and have some refreshments and have an opportunity for an informal session where everyone can come, look at the exhibits and our entire project team will be up here to answer any of your questions. Now, if you want to make testimony that will appear in the environmental assessment, on record of the environmental assessment, we have a tape recorder here and we'll have a person stationed near the tape recorder. We may move it over to there, though, I think, during this time, to keep the hubbub down, and we'll tape the testimony at that point. So you can speak into the tape recorder and your comments or questions will become an official part of the record on this project. Now the--if I can briefly run down the environmental assessment process: We look at every aspect of the environment that you can think of. We look at biology, we look at traffic, we loot at wetlands, we looked at--help me out here--

Donna Kiyosaki (DK): Noise.

Ron Terry (RT): Noise. We look at visual impacts, air quality, water quality, and for many of these studies we have individual consultants. We have a traffic engineer, we had a professional biologist, a professional wetlands consultant, an archaeologist who surveyed every inch of the alignment to see if there were any features. And I can--without going into the impacts of everything--you can read the environmental assessment if you'd like. We have several copies at the library, we have copies available at the Department of Public Works, the State Department of Transportation, and if you represent a community group or something, we sent out some but we can make some extra copies if you need to pass it around to a large group. You can read that if you want to get the full picture on everything, but in general, we didn't find a lot if impacts in most categories. Very few biological impacts. We're going to take a small area of wetlands, about 7/100s of an acre which is an insigificant amount in the context of what we have in Hilo, which actually is many thousands of acres. As you all know, most of your back yards are technically wetlands, if you didn't know. And we have no archaeological sites on the process. We don't have any water quality issues to speak of. We are passing over an area of flood plains and we'd be happy to go over that with any of you either formally or informally at any time, and we also have traffic concerns. And for the most part, we can--I think you'll--those of you who are interested in this will probably want to come up here, look at this diagram and ask questions about it. It looks at the '92 traffic volumes which were the biggest picture that we could get. It's a few years old but it's all the numbers. And then 2020 without the project, the year 2020 without the project, the year 2020 with the project. So we got those numbers up here for you to look at and I'm sure you'll be interested in these. For the most part, we find a tremendous improvement in traffic, although, you know, traffic is going to go somewhere and it's just going somewhere different here but I think if I--in a nutshell, what we can say is we're taking a whole lot of traffic off the Waianuenue-Punahele area that's not built for this traffic, and putting it on a road that has limited access and will be designed to handle this traffic, and this means that some areas will be getting less and some areas will be getting more. I think a concern to many people is the fact that Mohouli Street--the lower part--is going to see an increase in traffic. And our chief engineer is here to explain what we plan to do about that because that hasn't gone unnoticed and there are plans to help upgrade that separately from this project. And I think with that, I think we'll call this segment of the meeting to a close, we'll have an informal session. The coffee isn't brewed yet but it's coming along. We have some refreshments here and we'd like you to come up and take a look at the exhibits and ask us questions. And if any of you would like to give testimony, we'll have our tape recroder ready for you. Joy and Ethel can help handle your testimony. And when we're all done with that--we're talking maybe 30, 40 minutes or so, we can reconvene if you like and we can have a question and answer session up here. But I think it's first important--some of you have individual questions, I know, some of you are only interested in one thing and you want to find out what the answer to that is and then you're satisfied, so we don't want to prolong this unnecessarily. Thank you.

(Informal session, 45 minutes)

And we can begin. If someone has a question or comment, again, please come up here. Raise your hand and I'll recognize you to come on up. That's easy.

Mac Cooper (MC): Okay. Do you want my name?

Ron Terry (RT): Yes, would you please give me...okay.

Mac Cooper (MC): My name's Mac Cooper. I live at 305 Mohouli and I was looking at the EA as well as most of the traffic studies and it's very detailed down Mohouli to I guess Kumukoa, and then below that it's like there's no, there's no more information, and it seems like, I mean, I don't know where you think the cars go, right? I mean it's a sarcastic remark, but all those cars are going to end up at the intersection of Kinoole and the intersection of Mohouli and Kilauea. And I don't know if you drive through there at all but like that place is totally gridlocked as schools start up and close down there. So every day for like an hour in the morning and an hour in the afternoon, between Kinoole and Kilauea, like there's buses stopping, there's cars pulling off to drop kids, there's street monitors at two, three intersections right there, and it strikes me that it's a real hole in the EA to not have any comments whatsoever about those intersections because they're by far the most problem in this traffic issue...

Ron Terry (RT): Well, it's one of the problems, when you do a traffic study, is where to cu⁺ it off. Because everything is connected to everything else. I think John Muir said that, one of the original environmentalists. And if we--if we stop at somewhere, there's always another area that we can go to. Now, we have--although it doesn't show up on the diagrams--we have considered the effects on lower Mohouli. The diagram shows that we're going to have 12,000 cars as opposed to about 8,500 coming down here with the project instead of without. Now, we realize that most of those cars are not going to stop as soon as they get past the stop light. They're going to keep going. Some are going to turn on Kumukoa, some are going to go down to Kinoole and turn, some will extend all the way to Kilauea. We haven't modelled exactly what everybody's going to do. I'm not sure that we could do that for this project. But we have addressed what we're going to do about those traffic impacts--not in the context of this project, of this project, but as an additional, separate project that is a mitigation measure for the impacts that will occur here. And now that we have everybody's attention here, maybe Donna can describe for posterity what we plan to do about that.

Donna Kiyosaki (DK): Well, I'm sorry to say we don't have an exact plan. However, what is happening right now is we're in the process of selecting an engineering consultant to look at the existing Mohouli Street and we already have identified in the State Transportation Plan, what they call the STP, a project where we hope to get 80% Federal funding matched with 20% local funding which is how this project is being constructed, also to do improvement to the existing Mohouli Street, 'cause we realize there will be impacts. I think one of the comments brought up tonight was let's not just look at Mohouli, let's look at how much traffic will go down Kumukoa and see if that area also needs to be looked at, and I think in a planning aspect we will be looking at that aspect also. So we have a project underway; I can't give you any more details right now because we need our consultant to get on board. Obviously that will entail additional meetings, public hearings, when that project gets going, but we do realize there will be an impact and we are going to be addressing that in a separate project and stay tuned, keep informed. We will be sending out public notices when that process gets underway.

Lisa Cooper (LC): What kind of time frame are we looking at?

Donna Kiyosaki (DK): Well, we're under selection for a consultant which we hope to occur in the next month, then we're going to be negotiating a contract and we're probably looking at the consultant getting his study underway in early '98 and completing it sometime mid '98, I would assume, and then we'll be going into some type of public process at that time. So that's the approximate time frame, and then once that gets done then we will be looking at getting into some kind of construction plan so that we can actually design the improvements. Sometime--that would probably occur sometime toward the end of '98, I would assume.

Lisa Cooper (LC): So the timing between the ending of the Mohouli extension project and the mitigation responses would be--what type of a time frame...?

Donna Kiyosaki (DK): We'll probably be looking at--as construction of the Mohouli extension is going on, we complete our design of the improvements and then that would flow into that project. I mean, it would not be a lengthy time between the time it's completed and the time the improvements are done; it'd probably be going on somewhat concurrently but the improvements trailing by a little bit. That's my idea of what would happen right now.

Ron Terry (RT): Okay, do we have some more questions or comments?

Audience: ...question...

Ron Terry (RT): Can I get you to state your name and...?

Larry Komata (LK): Larry Komata. My question is when can we get traffic signals at Mohouli and Kumukoa?

Donna Kiyosaki (DK): Well, I think--

Larry Komata (LK): We don't need the business consultant for that, do we?

Donna Kiyosaki (DK): Well, right now I believe the traffic intersection studies that we've done to date does not show that that is one of our higher ranking intersections and we do have a traffic intersection study that was done. I don't know when, I don't know if you--

Ron Terry (RT): '94.

Donna Kiyosaki (DK): Was that '94?

Ron Terry (RT): Yeah.

Donna Kiyosaki (DK): They had targeted certain intersections in the city of Hilo as well as island wide that had a very high accident count, and that's basically what we utilize to define where we need to target our concerns at. Again, you know, with the improvements to Mohouli Street, we realize that that's going to be one of the targeted areas. I mean, we don't--we're not saying that we're not going to look at that but right now we are planning a signal at Ponahawai and Komohana, I believe. There is one planned for Lanikaula and Manono in Hilo and of course, there's the Ainako-Kaumana that is currently being installed and my feeling is that with this improvement to Mohouli Street, the signal at Kumukoa and Mohouli will be considered at that time.

Lisa Cooper (LC): So that's not a part of this extension at this time?

Donna Kiyosaki (DK): Not part of this extension, no.

Lisa Cooper (LC): It seems to me that that's going to be a critical problem as far as maintaining speed on Mohouli, coming down the hill. You're going to have a straight stretch of this extension which I'm assuming the speeds will be higher as there is not a large impact on the residential areas that come through that, the extension areas. With only one pause at Komohana, and even now, with the Komohana light there, you can sit in your driveway for a good five minutes before you can pull out in front of a vehicle without any fear of someone running into you so that you can move on also in traffic, and it seems to me if you're going to increase traffic by 50% on Mohouli and not have a light at Kumukoa to help break that stream of traffic and the traffic speed, that you're definitely going to have an increase in problems.

Donna Kiyosaki (DK): Well that 50% increase, number one, we need to put it into perspective. It's not until the year 2020, and I'm sure by the year 2020 we're going to be doing a lot of additional improvements to not only Mohouli Street but to traffic circulation in Hilo in general. We are planning to push forward with the Puainako Street extension which would take Puainako and improve it all the way from Kilauea up to the Country Club area of Kaumana and we feel--I don't believe that that road (because it's not a road yet) was added into the modelling when they did the--

Ron Terry (RT): It was.

Donna Kiyosaki (DK): Oh, it was? Okay. But that road will also be there and it will take traffic away. Also, like I said, the year 2020, there will be a whole bunch of additional improvements that will be done to Mohouli as well as other areas of Hilo, and I think that we've considered that. So, again, traffic will increase--it'll increase everywhere in Hilo by the year 2020--and those things will be done. It's not like we're going to have this whole bunch of traffic and we're not going to consider anything else during that time frame, and I think we need to be aware of that.

Lisa Cooper (LC): Yeah, but, even the stream of traffic that there is currently without any increase, there's an issue of getting out onto Mohouli. So if you increase the traffic at all, which--there's got to be a good number of vehicles that are going to come down not all day but certainly in the morning hours, at school hours, and also in the evening after work--

Donna Kiyosaki (DK): There's probably a half-an-hour peak in the afternoon and maybe a 45 peak in the morning, and a peak in the morning, and I realize that there are a lot of concerns. Volume or speed, I would imagine, both are concerns. You know, speeding is a problem. A lot of areas in Hilo, we try to control it with traffic control devices to a certain extent. To another extent, it has to be done by enforcement through police or the individual drivers need to understand what they're doing when they speed down roads, also. And it's a concern, but again, you know, I can understand the want for a traffic signal. I know there's also the want for a signal at Kukuau and Mohouli that I've heard tonight, and we need to consider all of these things. Again, we need to look at it in the context of project cost and where we can also fund these projects from, and it's something that we will consider. I mean, we're not saying that we're not going to think about all these things but, you know, we need to take them a step at a time, and that's our concern...

Ron Terry (RT): I could add something here. We probably didn't state the project's purpose and need very well. It's obvious to most people who live here what the purpose and need of it is. Of course, this is not a--different situation with a new road, I mean in the service of a new subdivision. This road does not service any new development. The University owns most of the land, the other land all has frontage that comes from some other street. We expect this to be a fairly limited access road. It's to get people from one place to another, so what we're really doing is redistributing traffic around Hilo and the reason for that is because we have such a problem. We have a bad problem on Kaumana Street, a bad problem on Punahele Street, a bad problem on Komohana Street. Kaumana has an accident rate of over six per million vehicle miles, which is three times the statewide average and, you know, the County is compelled to do something about this. When it starts seeing with accident rates of that level, it has to react, and no solution is going to be perfect for everyone. When we redistribute traffic, someone's going to have more traffic than they had before. It's a zero-sum game. We can't build entirely new roads between subdivisions. I don't mean this to belittle your concerns; they're very genuine and the County has to address them, we have to look at these, but what we're trying to do is take cars away from a bad problem area around Komohana and Waianuenue and get people from where they are to where they're going in a safe, efficient manner and that's the whole project's purpose and need. We understand it's going to take some tweaking. And now when we watch this road unfold, we're going to have to tweak it a little bit. We're going to have to add stop lights here and widen roads there and put turn lanes in. Some of this is going to be hard to tell until the road's actually there. We have traffic models but models are only so good.

Larry Komata (LK): See, my concerns right now--

Ron Terry (RT): Again, could you state your name?

Larry Komata (LK): Same name (laughter).

Ron Terry (RT): The tape doesn't know that--

Larry Komata (LK): Larry Komata.

Ron Terry (RT): Thank you.

Larry Komata (LK): The reason I'm asking about this traffic signal is because if you look at the map and compare it down to the industrial area, most of the traffic from that area will come up Lani-kaula, come up to Kumukoa, and they want to make a left on Mohouli. And now, if you're going to open up this extension, more so they're going to do that because they want to go as fast and as straight as possible to Kaumana.

Ron Terry (RT): Well--

Larry Komata (LK): They cannot make a left turn out of there, out of Kumukoa going up Mohouli. Your're gonna have a bottleneck right there.

Ron Terry (RT): Well, um--

Larry Komata (LK): I'm talking about construction vehicles--

Ron Terry (RT): That's possible, but of course--

Larry Komata (LK): It's happening now, Ron.

Ron Terry (RT): --but also people may say, hey, this is not the best way to get there. But there's no stop light; they may say it's not a very good idea to go on Kumukoa Street. Let's go down Kinoole Street, turn left, and then instead--or let's go down Kilauea and turn left. It's hard to say what people are going to do.

Larry Komata (LK): You have people coming up Mohouli, want to make a left turn on Kumukoa in the morning.

Ron Terry (RT): Right, you mentioned that. (inaudible comments/laughter) Yeah. I think your concern--I think that's a big message that we're hearing at this meeting tonight, if nothing else, is what we're going to do about lower Mohouli Street.

Larry Komata (LK): Yeah, we don't mind the extension. We welcome the extension, we just want the mitigation made and taken care of.

Ron Terry (RT): --some sort of commitment to these mitigation issues. I think we're hearing that, yeah. We've had some formal testimony, also. I encourage the rest of you who haven't made testimony, please do so. It's important.

Y. K. Hahn (YKH): (inaudible)

Ron Terry (RT): Okay. Do we have somemore comments here? Please come up here and state your name.

Newton Chu (NC): My name is Newton Chu. I'm a resident of Sunrise Estates. I'm at 478 Kupuni Street. The only testimony I'd like to give is to make sure that we have some mitigation factors as this road is built through the Sunrise Estates Subdivision. First of all, I'd like to see a signal, a traffic signal, at the intersection of Mohouli and Kukuau 'cause it's very difficult already to get out of our subdivision at Kukuau and Komohana, and the other thing, from a safety perspective I think it will slow down the traffic as you come down

Kaumana Drive and then turn down this extension road, they're going to speed through our subdivision. And right now it's a nice quiet subdivision. It's going to cut us off from our neighbors...but if we have a signal then we can still visit our neighbors (laughter). The other factor is if this road is built, I notice on the plan you have designed an 8-foot shoulder. I want to emphasize the fact that I think an 8-foot shoulder is important. Many people come up to our subdivision because we have shoulders so our kids can ride bikes and walk; there's a lot of walkers in our area, and if you make a shoulder here it's okay. They can come up and still walk in our subdivision. The other fact with having a shoulder is it creates the opportunity for bicyclists--and because I'm a cyclist and I'm also a member of PATH, and I'm on the Mayor's advisory committee on bicycles, I would like to see what we call inverse rumble strips, which it looks like a tractor ran through the asphalt when it was wet, and you can't see it when you drive, but if you veer off the road and onto the shoulder you hear it, okay, and it's also user friendly for bicyclists because you're not going to run into anything like if you put a curb up. They have that on the Queen K. Highway now and it's really quite nice, supposedly, so those are the things I wanted to add.

Ron Terry (RT): Thank you for your testimony. Donna, would you like to respond about the--could you please sign in--about the--Mr. Chu. Do you have a response to that?

Donna Kiyosaki (DK): Not really. I just--I talked to Mr. Chu earlier and I hear his concerns about the signal as well as the inverse rumble strips. One thing that I would think we need to consider with the inverse rumble strips is if there were any noise impact, especially as we do pass by--hopefully cars won't be running off the road but just a concern with rumble strips that we have in general, and I'm not sure if inverse ones cause any additional noise impact. Something I would I guess ask--ask to look at, anyway. But it's something that's a very real possibility and I think it's something that we might want to consider.

Newton Chu (NC): I think the noise proceeds in the car. So if you're driving, you know that you're off the main road.

Donna Kiyosaki (DK): Okay, well. It's something that we will definitely look at--cars affected. Ron is a cyclist, too, so he understands that.

Ron Terry (RT): One advantage that we have in Mohouli is that we don't have a lot of development on the extension. We're only going to have where it crosses Sunrise Ridge a little bit, and a little bit between Uluwai and Kaumana. So that's a distinct possibility and we'll look at that. Have some more questions or comments? Could I ask you to come up here? State you name.

Cindy Hoota (CH): My name is Cindy Hoota and we live in the Sunrise Estates Subdivision, also. Where our house exists, it'll be right where Mohouli goes next to. I have to kind of backtrack a little bit--before we purchased our lot, I guess about four, five years ago, it was indicated that there was a proposed Mohouli Street extension. When I called the planning department and I talked to Mr. Onuma (who's no longer with the planning department), he told me, his exact words were, "Don't worry about it. Never in your lifetime will they build this extension." So we purchased the lot and we designed our house faced a certain way because we knew the road wouldn't go there. So those of you who know that my son's basketball court is right there--so if he shoots and the ball misses it's going down Mohouli Street. But right before they finalized the plans for the approval, I called the planning department again, just to make sure, and it was just my luck, I got him again. He told me don't worry about it. They will never get the money for it. So we built our home and needless to say, I know where they say there's a need for it, but we bought that lot there because we wanted a nice quiet subdivision. We didn't plan to have thousands and thousands of cars go speeding past our house every day. Not only am I concerned with the safety of the kids there and the cars speeding, but I think something to consider is the noise and the smog and the exhaust in the area, so I was wondering if you folks are taking into any consideration putting up some kind of sound barrier for the homes that are already existing there, because we built our homes there not knowing that this subdivision would go in--I mean, this road would go in. I think right now the main ones affected are us and Garrett and Diane. So I think as a concession that's the least that you folks could do for us.

Ron Terry (RT): Yeah. In answer to the question about the noise and the air pollution, we have looked at the air quality, we expect regional air quality will go up to improve with this project, it usually does when you get a shorter route from one, from point A to point B. But there are micro-scale effects. We'll expect them at Kaumana Drive and Ainako and at Mohouli Street and Komohana. The carbon monoxide levels will go up there. We predict--they're already above State standards if you're on the sidewalk, they're already above State standards. We expect them to stay above State standards and perhaps go above Federal standards at one intersection in the a.m. peak hour--that's Mohouli and Komohana. That's not a tremendous worry because we have--there's no development. There's nothing at that corner and we don't expect anything to be at that corner for a while. That's University and State lands on all sides and it will be undeveloped and that's one thing that we will, you know, specify, is that *that corner is not a good place to develop.* There are no other places where we expect air quality problems because of the road. As far as noise, we've done a detailed noise study of the area and your insight is correct. Your property is affected more than anyone else on the entire extension and it is--according to our model, it is not impacted above Federal standards. We have to see an increase up to 66 decibels dBA LEQ, as they say in the business. I can show you the noise study, you can look at it.

Cindy Hoota (CH): Compared to what we have now, which is nothing, if we're going to have thousands of cars...

Ron Terry (RT): Right. Yeah, we don't, we don't have a noise measurement from your actual house and there's possibly a case to be made that it will increase 15 decibels above the existing level, which would qualify you under the Federal guidelines for a noise barrier. I'd be happy to go into this in more depth with you.

Don Hoota (DH): (inaudible)

Ron Terry (RT): Coula I have your name and can you come up here?

Don Hoota (DH): My name is Don Hoota--

Ron Terry (RT): Is it moving?

Bruce K. Meyers (BKM): Yes.

Don Hoota (DH): My name is Don Hoota and I'm Cindy's husband. We live in the same house, and in the same conversation here, if you, if you put a stop sign or a stop light on the intersection of Kukuau and the new Mohouli extension, the noise level, without question, will go up.

Ron Terry (RT): Right.

Don Hoota (DH): What we're saying is, well, besides all the emission because when a car accelerates that's the worst time as far as noise is concerned, and exhaust. So what we're saying is, you know, if you are planning on doing anything to minimize the effects--

Ron Terry (RT): Well, there are no plans to put a stop light at that intersection. No stop light, no stop sign.

Cindy Hoota (CH): I think you should because, as Newton said, those cars are going to come flying down that street.

Ron Terry (RT): Well, we can take that into consideration, but I think the strength of traffic is not justified to put a stop sign there. The amount of traffic is quite small compared to what we have...

Cindy Hoota (CH): For now...

Ron Terry (RT): Well, maybe in the year 2020, compared to other places that might require stop lights. I mean, that's something that we can consider if that's what--but that's not in the existing plans. Are you done.

Cindy Hoota (CH): For now...

Ron Terry (RT): Mr. Newton Chu again.

Newton Chu (NC): I think when we purchased our lot, too, there was a discussion of having--we were told about this possibility, that there would be an extension through here. They didn't say when, but we were also told that--at that same meeting--that a signal would be placed there and I think we were told that by the developers.

Donna Kiyosaki (DK): Yeah, I told Mr. Chu that we would check the claims that RSM said they would develop a signal at the intersection of Mohouli and Kukuau ana I'm not aware of that offhand so we will check the records.

Bruce K. Meyers (BKM): I recently met with the traffic engineers and they asked us to take a look at putting in at least the conduits at that intersection.

(inaudible)

Bruce K. Meyers (BKM): Future stop signals. So we're in the process of looking at that in terms of what kind of cost impact it would be onto our budget.

Larry Komata (LK): What's the speed limit going to be through there?

Bruce K. Meyers (BKM): 35 posted. (laughter/inaudible)

Larry Komata (LK): So about 45, then.

Ron Terry (RT): This is where we put in the transcripts "general hilarity." Are we--?

Bruce K. Meyers (BKM): Still going. We've got plenty (audiotape).

Ron Terry (RT): Okay. More comments or questions again, please come up to the front and state your name. Sorry to make it so humbug.

Bob Okinaka (BO): My name is Bob Okinaka. I live on the Uluwai and Ainako extension. It's going to come up to--Mohouli is going to come up my intersection. My problem is not pretty much what we're talking about. My problem is water. So if they make a road, we're going to have a lot of water coming down. And if it's--if the road is higher than my lot, my--water's going to back up right into my basement and if that happens, heaven knows what's going to...So I talked to Bruce about it and I pretty much addressed the problem and Bruce will see if he could come over to my house and talk to me on a one-to-one basis and I will explain to him how much water comes down. Just to give you an example: When they were building a golf course at one time there, this guy didn't realize the amount of water coming down so they just bulldozed the whole place. The land was way higher than my lot. Water came down just this past--oh, it was a few years back--the water came down. My back yard was above my knees. The water just rushed down. So I called Vern Yamanaka who was the realtor--I called him. He said okay, we'll come back tomorrow. I said, I want you here now, when the water's coming down; I want you here now. So he came up and he was so shocked and flabergasted at the amount of water coming down. He got the guys who were working on the bulldozer all the way down, bring them right back up and take this place down. They dug the place, the water went down. So hopefully, you can solve this problem. I'm not against the project, but address the problem first. Thank you.

Newton Chu (NC): Is there going to be a bridge over that flood plain?

Donna Kiyosaki (DK): Alenaio, I think he's talking about...

Ron Terry (RT): That's Newton Chu, for the record.

Bruce K. Meyers (BKM): It'll either be a bridge or a series of wide-arch culverts.

Newton Chu (NC): The capacity of the culverts--will it be Q... to allow the passage of a 50-year flood or a 100-year flood? There's a difference.

Bruce K. Meyers (BKM): Um, yes, there is a difference. Well, normally to standards it's 50-year, okay. The interesting thing about Alenaio is it's hard to say how much is crossing there. So our I guess feeling is to try and look at the most conservative, well not most conservative; we have to take into account the cost as well. But look at trying to take--say it's a 100-year or--'cause there's a lot of numbers that we get from say, the Army Corps of Engineers or whoever, and so we have to take a look at that and we want to design with comfort. I want to sleep at night, so...

Ron Terry (RT): One of the problems with the Alenaio at that point is that it's not above ground for the most part. It's below ground. It's in lava tubes and cracks and other things and there have been no real serious hydrological studies to show what proportion of it is above and below ground at various flow levels and I think what Bruce is trying to say is that they're going to make the assumption that a whole lot of it is above ground, even though this may not be true. Most of it may still be underground. They're going to make the assumption that it's there and try to pass that flow. It's a difficult environment. It's going to require more engineering on their part.

Bob Okinaka (BO): I think, actually, that if you're not going to look at the Alenaio side, what I think you should be looking at is the Waipahoehoe side, 'cause the Alenaio is below that.

Ron Terry (RT): They come together above here.

Bob Okinaka (BO): They do?

Ron Terry (RT): Yeah. They do and maybe this is a good place for the flood plain map...I had one.

Donna Kiyosaki (DK): Let me go over the comments, talking about Alenaio. Just to let everybody know, the County also has a project under way, under design, to improve the Alenaio crossing at Komohana Street, which obviously, all of us who live in Hilo know, is a problem when we have that big flood that comes to Hilo town, so we are currently under design through another consultant to improve that crossing of Alenaio and Komohana so we don't have a culvert blow out and the problems that we've had in the past.

Bruce K. Meyers (BKM): This is the Mohouli extension that we're talking about tonight and this is the crossing here at Alenaio. Now Waipahoehoe is up here, and as you can see it turns into Alenaio.

Ron Terry (RT): It's Alenaio down below Komohana Street definitely and it's Waipahoehoe above, and I'm sure many of you have been out in this area and it's hard to say what this is at any time. It's 500 feet of confusion.

Audience: What are you going to do about the flood area near Komohana and Mohouli intersection?

Bruce K. Meyers (BKM): This one here. Well, the intent is to not affect, as far as downstream, here, at all, as far as down below here. In other words, we can't add to this when we build the road. So basically what you'll see is--imagine, if you will, a white line going through this. That means, that means the top of the road. So in essence it sort of splits this, but this is going to the same place, which is that big ditch that runs across this way and then through the culvert crossing down here. Okay, so the idea is to see that the water either comes down this side or this side either by channelization or by some way to get it into this ditch here where it is already going through at this time.

Audience: Are you going to have another public hearing later on?

Ron Terry (RT): No. This is the public hearing for this, right. We've had a couple of meetings on this so far to gather input but this is the public hearing for the project and the end of comment on the project is due October 22, so if you have some comments that you'd like to make in addition to what we're saying tonight, please make them in writing and address them to Donna Kiyosaki, Chief Engineer, Department of Public Works, and make sure you get 'em postmarked before October 22.

Donna Kiyosaki (DK): That, again, that's the formal process. Of course, we're there all the time. The County is there willing to take your input as the design process continues because this is kind of the start of the design, the formal design process. We're just getting to the environmental process. So, I'm there. You can write to me. I'm sure Bruce at Okahara (you can either look it up in the phone book)--he'd be willing to give you his address tonight and phone number. You know, any time you want to call Bruce, please feel free. It's on us.

Ron Terry (RT): Even at home.

Donna Kiyosaki (DK): Again, we're always available. So this is not the end, this is just the formal hearing process, but we're there and please feel free to contact us.

Ron Terry (RT): Okay. Could you come on up, I'm just not sure we're going to catch you here (on the tape recorder).

John Nakashima (JN): My name is John Nakashima and we have a lot in Sunrise (Ridge). I have only a couple of questions. Your modelling shows the 1992 proposal...do you have a model of what the street would look like when you open up the Mohouli Street extension?

Ron Terry (RT): No, we didn't. It'll be close to the '92 numbers, a little bit higher. Five percent, maybe, but it's been the general trend on the County roadways.

John Nakashima (JN): No. According to the '92 models you chose, there's no traffic shown coming down Mohouli Street.

Ron Terry (RT): Right.

John Nakashima (JN): So when the street opens up--I can understand the year 2020 or whatever, it's a long-term model, but you want to also look at the short-term modelling as to what the immediate impact is going to be when that street actually opens.

Ron Terry (RT): No, we did not do that calculation, but that's something that we can backtrack to.

John Nakashima (JN): To me that would be one of the biggest factors; to actually see how much traffic is coming down Mohouli Street or coming directly off of Waianuenue into Mohouli.

Ron Terry (RT): Right, yeah.

John Nakashima (JN): 'Cause that'll be what the short-term impact (inaudible).

Ron Terry (RT): It'll be less than this. I can't tell you exactly how much less, but less than 12,000. That's a number that we can ask our traffic engineer to try to derive for us, and I will, to try to find out what that number is.

John Nakashima (JN): The other question I had is, the 2020 project modelling is based on, you said, the Puainako Street extension being built.

Ron Terry (RT): That's correct.

John Nakashima (JN): Did you do a modelling without it?

Ron Terry (RT): No, we did not. When you do a modelling you get--you have to set some certain conditions. There are other things that may be built and are not going to be built. And we're already modelling two difference scenarios. If we say with Puainako, without, you know, with Kawailani, without; with Saddle Road, without...we're getting into 6, 12, 18, 36 different sets of numbers and it starts to get impossible, so we set the conditions that we felt were most likely to

	occur in 2020. That we would have the Puainako extension built and that the Saddle Road would be improved at least to some degree. We don't have that without.
Audience:	Do you have Kupulau in there?
Ron Terry (RT):	No. We don't have--we did not factor Kupulau or Kawailani. These were two assumptions that we left out of the model. You can start to see everytime you add an assumption, you double the numbers of scenarios that you can get and pretty soon it gets out of hand. So, you know, we made some assumptions, but I say they're safe bets--without the Puainako extension, with the Saddle Road, there's a whole lot more traffic. Without--no Saddle Road--Puainako extension, less traffic. Neither project--more attractive, but not as much as the other way. So I think you get my point. It's difficult to examine every single scenario that can happen.
Audience:	You said up Kaumana is basically the highest rate of accident/ incident rates per million in miles or whatever...
Ron Terry (RT):	It's three times higher than the State average.
Audience:	That's based on all of Kaumana or lower Kaumana or upper Kaumana?
Ron Terry (RT):	This is based on the lower Kaumana from Ainako on down and the upper section, I'm not sure of the accident rate. We had it a few years ago; it was also extremely high. These are non-intersection accidents. People--you know, coming out of driveways, veering off the road, that sort of thing.
Audience:	And the proposals were for improving the upper Kaumana section also...
Ron Terry (RT):	I think that the County strategy is--Donna can jump in here and correct me--is to try to--Kaumana is a difficult road to improve. We're trying to siphon off traffic at various points, 'cause most people that are heading down Kaumana are actually going--they're not down to the bottom of Kaumana, they're going into Waiakea. That's the general traffic flow, so we're trying to get people to where they're going, and Puainako is one, Mohouli is another. Eventually Edita Street may connect to Kukuau Street, that's a proposal (who knows when?). Kawailani/Kupulau, that may occur. As these projects get further down the list they get more and more in the future and more uncertain. But that's the proposal for Kaumana. I think the plan is to have Kaumana return to

what it was, which is more of a rural street and not a major collector as it's turned into.

Donna Kiyosaki (DK): You know, again, Mohouli, this project, we're hoping that the plans and specs, the design, will be completed in '98 and construction started late '98, early '99 at the latest. We hope Puainako, right now, which is also under State Transportation plan and is being proposed as an 80/20 Federal/local share match project to be in the '99 calendar year time frame as far as to start construction. So we are really convinced that Puainako will be coming in within this 2020 time frame and that is what we're pursuing right now. Kupulau and--which would--basically, for those of you that don't know--Kupulau was planned to extend from the Haihai-Kawailani area and come down and hit Ponahawai Street, crossing both Mohouli and Puainako extensions. That project, we don't have an exact time frame on that, but again, that would probably follow after these two projects get under way. So, all of this together with all of these other proposed roadways in the future will be impacting this scenario, but again, I think the traffic studies that we show here is very conservative, taking into account only the Puainako extension at this point in time, without the other roads connecting.

Audience: Taking the basic problems from Ainako down to Komohana. That seems to be the volume area...and not so much traffic going up there.

Ron Terry (RT): It's both ways. Oh, you mean above Ainako?

Audience: No, going up toward--yeah, towards Ainako versus coming down Ainako. In the morning there's the crowds coming down (inaudible).

Ron Terry (RT): The a.m. peak is the worst, right?

Audience: Have they considered alternate measures like contra-flows there and things like that?

Ron Terry (RT): We have looked at it. The contra-flows requires more lanes than we're got right now. People use Punahele too and the contra-flow... What the County has is the one-way system in the morning, and I think everybody who's been subjected to that knows that it's less than successful because we just don't have enough capacity in that area. It's not well suited to it. We believe that--maybe I really shouldn't say this, but--our traffic engineer states that we can get rid of the one-way traffic pattern on Waianuenue with full justification. No problem. After the Mohouli is done, because as I think most of you know, it has a certain amount of problems. It's very difficult to get uphill. And as Saddle Road becomes more used, it's going to be necessary to allow the capacity of traffic to go up that hill as well as down. As some of you know, Saddle Road is--right now there's a very serious EIS under way to examine improvement of Saddle Road, looking at traffic will eventually be up to ten times as much as what it is right now 30-40 years from now. To think long term, it's hard. You know, what I think what we'll do at this point is--since I see people getting restless--we'll, we'll stop this open session right here. If you have anymore questions or comments, we'll be happy to take 'em. Comments, speak into the mic with your name. Questions, just come up and ask us. We can take informal questions now. I want to thank everyone for coming here. I'm really gratified to see this kind of a turnout and believe me, your input is very important on this environmental assessment. Every point that you brought up is going to be carefully considered. Where feasible, we're going to try to incorporate it as mitigation measures that you suggest and I hope to be able to get in touch with some of you, Newton, for example, talk some more about the bicycle issues and see if there's a way that we can incorporate this in. Again, the comment period on this environmental assessment is over on October 22 so if you've got some written comments, please get them in by that time. The environmental assessment is available at the library; we've sent several copies to the Hilo Library and they are available on file at Department of Public Works, the State Department of Transportation and in Okahara's office which is right near 7-Eleven on Kilauea Avenue, 200 Kohola Street, and if you've got a community group and you need a copy, you've absolutely got to have your own copy, see me and we'll get one. Again, thank you very much.

(end of recording)

Mohouli Street Extension
Tape 2 - Recorded Testimony

(inaudible beginning of tape)

Bruce K. Meyers (BKM): State your name and then your questions.

Garrett Sasaki (GS): I don't know if it's a question. Anyway, my name is Garrett Sasaki. I have a house that's right adjacent to the proposed extension and I'd just like for it to be on the record that I need for someone to take a look at, you know, the noise and the air pollution that might be generated from this extension and the impact it may have on my house.

Bruce K. Meyers (BKM): Yes, that issue came up earlier tonight. Are you across from Don?

(inaudible)

Garrett Sasaki (GS): No, kitty corner, same area, so...

Bruce K. Meyers (BKM): That comment came up so as far as for Don the same will apply to you. So what we do for them we'll do for you also.

Garrett Sasaki (GS): Thank you.

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

8. Summary of Issues/Responses

MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

SUMMARY OF PUBLIC HEARING ISSUES/RESPONSES

The following list summarizes each issue raised at the public hearing on October 8, 1997. It also provides the response that the Hawaii County Department of Public Works concluded after considering and researching each question.

1. LOWER MOHOULI STREET TRAFFIC INCREASE

   Several speakers noted that the predicted 50% increase in traffic relative to the No Project Alternative would make it more difficult to exit from driveways and Kumukoa Street.

   RESPONSE: As stated in the EA, "In response to current deficiencies and the expected traffic increases, the County of Hawaii has anticipated the need for mitigation measures. Planned for inclusion in the federally approved Transportation Improvement Program (STIP) for fiscal years 1997-1998 are projects to consider the upgrade of Mohouli Street by widening, installing curbs, gutters and sidewalks, and supplying a traffic signal at the Kumukoa Street intersection. Included in the STIP is a project to install a traffic signal at T-intersection of Ponahawai and Komohana Streets. These improvements will substantially mitigate increases to traffic resulting from the proposed project." Since the writing of the EA, the County has begun the process of selecting a consultant for engineering services to prepare plans and specifications for road widening, pedestrian and drainage facilities, and installation of a new traffic signal at Mohouli and Kumukoa Street.

2. NOISE IMPACTS AT/NEAR KUKUAU/MOHOULI STREET INTERSECTION

   Two speakers with frontage on the proposed extension noted that the noise analysis of their properties did not take note of their recently constructed homes.

   RESPONSE: The noise impact consultant undertook a second analysis of the properties in Sunrise Estates based on homes built or under construction (see attached letter). The conclusion was that the resulting noise levels at 2020 would not exceed the FHWA criteria of 66 dBA L_{eq} nor would increase by 15 decibels or more from existing levels.

3. INVERSE RUMBLE STRIPS FOR BIKE LANE/SHOULDER

   One speaker noted that grooves or inverse rumble strips that had been installed on Queen Kaahumanu Highway in West Hawaii had been very successful in separating bicycle and automobile traffic. He asked that use of this technique for Mohouli Street be investigated.

RESPONSE: In response to this comment, the DPW requested its engineering contractor to investigate the feasibility of inverse rumble strips for the project. The contractor determined that the strips would increase the cost of the project because a higher grade of paving material is required, but it does not appear to be a substantial difference. In addition, because this is a relatively new technique, there are still some maintenance flaws that have not been worked out. However, the main concern - and the reason DPW has decided not to place them on the Mohouli Street Extension - is that they may not be well suited to the high rainfall of the area. The grooves will probably tend to collect water, accumulate moss, and foster weed growth. DPW will await a solid history of results based on further State Highways installations before it puts this into practice on County roads. DPW believes that the 8-foot shoulders on the road will adequately provide for bike safety. DPW will monitor the situation, hopefully with help from the Mayor's Advisory Committee on bicycles.

4. FOUR-WAY STOP OR TRAFFIC SIGNAL ON MOHOULI AT KUKUAU

Several speakers questioned whether a greater level of traffic control facilities might be warranted at this intersection. There appeared to be no specific mention of the need for such facilities or lack thereof in the EA

RESPONSE The traffic consultant for the project noted that the *Manual of Uniform Traffic Control Devices for Streets and Highways* states that four-way stops are only appropriate when the volume of traffic on intersecting roads is approximately equal, and the volume of traffic from the minor street exceeds 200 vehicles per hour for at least eight hours (see attached letter). These conditions are not met or even approached at the intersection. For signalization, federal requirements state that least one of eleven warrants must be exceeded in order to install traffic signals. Typically, the Peak Hour Volume Warrant is most likely to be met. Again, the volumes are not high enough to meet this warrant. Therefore, a two-way stop sign is the most appropriate traffic control at this time. As with all County road intersections, DPW will continue to monitor the situation.

5. DRAINAGE ISSUE NEAR ULUWAI STREET INTERSECTION

One speaker noted that the existing one-block section of Ainako between Kaumana Drive and Uluwai Street (which will become part of the Mohouli Street Extension) has flooding problems. A ditch on the makai side of Ainako Avenue conveys runoff from Kaumana Drive towards vacant land past the current terminus of Ainako Avenue. This ditch often overflows because of downstream blockage.

RESPONSE: Although the drainage plans have not been finalized, the ditch will probably be relocated to the mauka side of (Ainako Avenue) Mohouli Street. No overflow is to be expected, as this runoff will be directed towards improved drainage facilities downstream.

6. CUL-DE-SAC KUKUAU STREET

One person requested during the informal, individual question-and-answer that the County consider blocking Kukuau Street just east of the Mohouli Street intersection and create a cul-de-sac. This would prevent traffic from turning east down Kukuau Street and would reduce traffic in Sunrise Ridge.

RESPONSE. Kukuau Street has been envisioned as an integral part of the through street connectors for Upper Hilo. Eventually it is expected to link with the Kupulau/Ponahawai Extension and possibly through another route to Kaumana Drive. Blocking Kukuau Street would prevent the street from performing this collector function.

7. SUNRISE ESTATES DEVELOPER COMMITMENTS

Several speakers noted their understanding that the developer of Sunrise Estates was obligated to provide a traffic signal at the intersection of Mohouli and Kukuau Streets. The Chief Engineer stated that she would investigate this situation.

RESPONSE: The reference appears to be to conditions imposed by the Planning Commission as part of Change of Zone Ordinance 93-30 (memorandum summarizing the conditions is attached). Although the conditions, not all which have been yet fulfilled, do refer to various signals, there is no condition concerning the subject intersection.

GEO METRICIAN
Ron Terry, Ph.D.

HCR 9575
Keaau, Hawaii 96749
(808) 982-5831

November 2, 1997

Julian Ng, Inc.
P.O. Box 816
Kaneohe HI 96744-0816
FAX: 235-8869

Dear Mr Ng:

At the public hearing for the Mohouli Street Extension conducted by the Hawaii County Department of Public on October 8, several residents of Sunrise Estates brought up the issue of whether the County should install a four-way stop sign or traffic signal at the intersection of Mohouli and Kukuau Streets.

In your report, you state that "the intersection has been assumed to be unsignalized, with stop signs controlling the Kukuau Street approaches." Is this assumption justified by the traffic levels? Should a warrant study be conducted?

We would appreciate your prompt response so that we can finalize our design, respond to community comments, and conclude the EA process.

Ron Terry

cc: Ben Ishii, DPW FAX 961-8630
Bruce Meyers, Okahara & Assoc. FAX 961-5529

Julian Ng, Incorporated
Transportation Engineering Consultant
P.O. Box 816 Kaneohe, Hawaii 96744-0816 **phone: (808) 236-4325**
fax: (808) 235-8869

November 3, 1997

Ron Terry, PhD.
Geo Metrician
HCR 9575
Keaau, Hawaii 96749

Subject: Mohouli Street Extension
Future Intersection of Mohouli Street and Kukuau Street

Dear Ron:

The subject intersection was assumed to be unsignalized, with stop controls on the Kukuau Street approaches because Mohouli Street is considered a collector street serving significant through traffic while Kukuau Street is a local street with less traffic. The unsignalized analysis of the intersection for projected year 2020 volumes showed acceptable Level of Service C or better conditions, which means that no further improvement will be necessary.

Section 2B-6 of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (*MUTCD*) states that four-way (or "multi-way" stops) should "be used only where the volume of traffic on intersecting roads is approximately equal." The *MUTCD* also indicates that a minimum volume (vehicles and pedestrian) from the minor street must average at least 200 units per hour for eight hours." These conditions are not expected to be met at the subject intersection in the design year (2020) or at completion of the project. Therefore, a four-way stop would be inappropriate.

For signalization, at least one of the eleven warrants (or minimum conditions) described in the *MUTCD* must be exceeded in order to install a traffic signal at an intersection involving a Federal-aid roadway. Typically, the Peak Hour Volume Warrant is the most likely warrant to be satisfied. This warrant would be satisfied if a point representing the intersection's peak hour volumes plotted on Figure 4-5 of the *MUTCD* is above the appropriate curve. As shown in the attached drawing, the volumes for year 2020 fall below the curve. The *MUTCD* curve should also be used in cases where the roads do not receive Federal-aid. One final point: the satisfaction of a signal warrant in itself is not justification for signalization.

Traffic signals at the subject intersection are not needed or warranted based on the projections of traffic to year 2020.

Should there be any questions, please contact me as indicated above.

Sincerely,

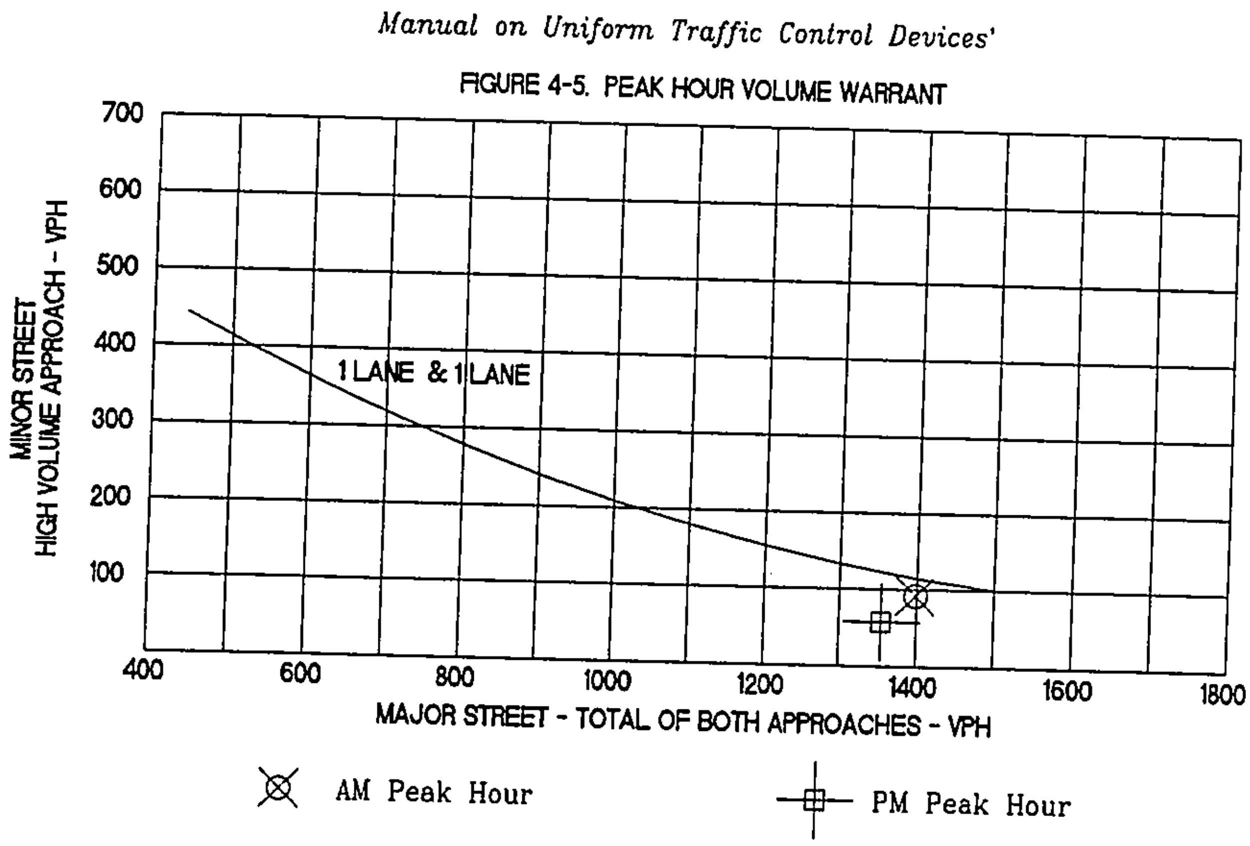
JULIAN NG, INC.

Julian Ng, P. E.
President

Attachment

RT1103.DOC

MOHOULI STREET AND KUKUAU STREET
YEAR 2020 PEAK HOURS



Note: Traffic volumes from traffic study for EA, August 1996

GEO METRICIAN
Ron Terry, Ph.D.

HCR 9575
Keaau, Hawaii 96749
(808) 982-5831

October 27, 1997

Yoichi Ebisu, P.E.
Y. Ebisu & Associates
1126 12th Ave., Rm. 305
Honolulu HI 96816

Dear Mr Ebisu:

At the public hearing for the Mohouli Street Extension conducted by the Hawaii County Department of Public on October 8, several residents of Sunrise Estates brought up the issue of noise impacts. Their particular concern was that their houses, although immediately fronting the proposed Mohouli Street right-of-way, did not appear to have been mapped in your report. I believe that these houses may have been under construction during the time your field work was underway. In any case, I would appreciate it if you would supplement your report with a letter addressing impacts at these two homes. I have attempted to provide below all the data which you will require. Please refer to the map of this subdivision which was previously supplied to you.

House	Location	Dist. to Mohouli St. Centerline*	Dist. to Kukuau St. Centerline*	No. Stories
1	NW corner Kukuau & Mohouli Streets	60 feet	80 feet	1
2.	NE terminus of Kipuni St. (fronting Mohouli)	> 120 feet	420 feet	2

* from closest edge of lived-in portion of home

The bottom floor of both houses appear to be essentially at or near the grade of the existing ground surface.

Ron Terry, Ph.D.
Project Environmental Consultant

cc: Bruce Meyers, Okahara & Associates

Y. Ebisu & Associates
Acoustical and Electronic Engineers

1126 12th Avenue
Room 305
Honolulu, Hawaii 96816
(808) 735-1634

Job #34.005
November 14, 1997

Geo Metrician
HCR 9575
Keaau, Hawaii 96749

Attention: Mr. Ron Terry, Ph.D.

Subject: Reevaluation of Potential Traffic Noise Impacts at Two New Residences Near the Proposed Kukuau and Mohouli Street Intersection

Dear Mr. Terry:

In accordance with your request letter dated October 27, 1997, I evaluated the potential traffic noise impacts at the two new homes on TMK 2–4–73:34 and 2–5–06:149, which I will label as Locations H1 and H2. I assumed that Locations H1 and H2 were 80 and approximately 100 feet, respectively, from the centerline of the proposed Mohouli Street Extension centerline. I used the most current highway plans (Sheet C–6, Job No. T–3261), which I received from the project's Civil Engineer, and the site plan for the home at Location H2 which you sent to me.

<u>Existing Noise Levels</u>: Existing background ambient noise levels during the AM peak hour were measured at Location A (see Figure 1, Page 4 of my traffic noise study report dated July 1996). Measured average Leq from traffic on Kukuau Street, as well as from distant traffic, roosters, crickets, etc., was 49.9 Leq between 6:40 AM and 7:00 AM (see Table 1, Page 6 of my noise study report). At Location A, between 7:10 AM and 7:45 AM, measured background ambient noise level between traffic was 48 dB, and was controlled by distant road traffic and natural sources. This level of 48 dB should also represent the existing background ambient noise levels at Locations H1 and H2, which are at larger distances from Kukuau Street than Location A.

<u>Future Noise Levels</u>: Forecasts of future noise traffic noise levels at Locations H1 and H2 were developed using the traffic assumptions shown in Table 8B on Page 28 of my traffic noise report. According to the project's Civil Engineer, a 35 MPH speed limit will be posted along the entire length of the Mohouli Street Extension. Within 350 feet of the Kukuau Street intersection, I assumed an average speed of 35 MPH. Beyond 350 feet from the Kukuau Street intersection, I assumed a 45 MPH average speed, which is slightly less than the 50 MPH assumption shown in Table 8B. The 98% automobile, 1% medium truck, and 1% heavy truck mix was also used.

Using the above assumptions, and a two–way, PM peak hour volume of 1,380 VPH, the CY 2020 forecasts of traffic noise levels were 62 Leq at Location H1 and 62 Leq at Location H2. Both of these values do not exceed the FHWA noise abatement criteria of 67 Leq or the proposed State DOT criteria of 66 Leq. In addition, with existing residual background ambient noise levels of 48 Leq, the forecasted traffic noise levels should not exceed the proposed State DOT criteria for significant increase of 15 dB or more.

Noise Abatement Measures: By current FHWA and Hawaii State DOT criteria, noise abatement measures are not required for the homes at Locations H1 and H2. It should also be noted that the proposed State DOT criteria only require a traffic noise analysis on undeveloped lands if the noise sensitive use has received a building permit at the time of the original noise analysis. We should be advised if any building permits were obtained for the Sunrise Estates Subdivision prior to July 1996.

Sincerely,

Yoichi Ebisu, P.E.

Stephen K. Yamashiro
Mayor

RSN — FYI

Donna Fay K. Kiyosaki
Chief Engineer

Riley W. Smith
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS

25 Aupuni Street, Room 202 · Hilo, Hawaii 96720-4252
(808) 961-8321 · Fax (808) 969-7138

March 14, 1995

MEMORANDUM

TO: Planning Department

for

FROM: Donna Fay K. Kiyosaki, P.E.
Chief Engineer

SUBJECT: SUNRISE ESTATES, INCREMENT II
Change of Zone Ordinance 93-36
Subdivision No. 93-30
TMK: 2-4-08: 14
Folder No.: 24437-C

In response to meetings held between the County and HSC, Inc., the following is our understanding of requirements which will comply with the change of zone ordinance for Sunrise Estates, Increment II.

1. In lieu of the design and installation of traffic signals at the Kukuau/Komohana intersection, HSC will contribute $175,000 to the County by July 1995.

2. HSC will provide to the County approved engineering plans and specifications for the installation of traffic signals at the Mohouli/Komohana intersection. HSC will also obtain any necessary permits for the project to be bid out. The scope of the plans include signalization of the "T" intersection with facilities to accommodate future modification to a four-way intersection. The planning and engineering work by the developer will be considered as his contribution towards Federal ISTEA funds.

3. Contribute $60,000 towards the local match for the portion of Mohouli Extension between Kukuau Street and the Ponahawai golf course. The developer is still responsible for the construction of the portion of Mohouli Extension from the Puna boundary to Kukuau Street. In lieu of constructing this portion of the roadway, the developer may contribute additional monies towards the Mohouli Extension project in an amount approved by the Department.

24437-C

Memo to Planning Department
Page 2
March 14, 1995

4. HSC will deed to the County all lands needed for the Mohouli Street Extension.

5. HSC will upgrade and increase capacity of the drainage system bordering the Sunrise Estates, Increment I subdivision.

Should you have any questions, please contact me.

cc: ENG
TRF
Planning Department
Mayor

App. 5

comments

MOHOULI STREET EXTENSION
ENVIRONMENTAL ASSESSMENT

PUBLIC INVOLVEMENT APPENDIX

9. Comment Letters and Responses to the Draft EA

9600 ?

Stephen K. Yamashiro
Mayor

Harry Kim
Administrator

Bruce D. Butts
Assistant Administrator

County of Hawaii
CIVIL DEFENSE AGENCY
920 Ululani Street • Hilo, Hawaii 96720
(808) 935-0031 • Fax (808) 935-6460

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SEP 24 1997
OKAHARA & ASSOC., INC.
HILO OFFICE

TO: Donna F. Kiyosaki, Chief Engineer
Hawaii County Department of Public Works

FROM: Harry Kim, Civil Defense Administrator HK
Hawaii County Civil Defense Agency

DATE: September 23, 1997

SUBJECT: Draft Environmental Assessment for Mohouli Street Extension, South Hilo District, Island of Hawaii

The concerns of the Hawaii Civil Defense Agency remain the same as stated in the correspondence to Bruce Meyers of Okahara & Associates, Inc., dated February 21, 1996 (copy enclosed).

Please call if further information is needed.

dy

Enclosure

cc Gary Gill, Hawaii State Office of Environmental Quality Control
Kazu Hayashida, State Department of Transportation
✓ Bruce Meyers, Okahara & Associates, Inc.
Abraham Wong, Federal Highway Administration

Post-it® Fax Note 7671	Date 10/27/97 # of pages ▸ 2
To RON TERRY	From ETHEL
Co./Dept.	Co. OKAHARA & ASSOC
Phone #	Phone # 961-5527
Fax # 907-6931	Fax #

Stephen K. Yamashiro
Mayor

Harry Kim
Administrator

Bruce D. Butts
Assistant Administrator

County of Hawaii
CIVIL DEFENSE AGENCY
920 Ululani Street • Hilo, Hawaii 96720
(808) 935-0031 • Fax (808) 935-6460

February 21, 1996

Bruce K. Meyers, P.E.
Okahara & Associates, Inc.
200 Kohola Street
Hilo, HI 96720

ENVIRONMENTAL ASSESSMENT FOR MOHOULI STREET EXTENSION
LETTER NO. 44527, REFERENCE NO. 96003

The proposed extension crosses over areas of flooding concerns during heavy rains.

It is extremely critical that the proposed extension does not add to the runoffs between Komohana Street and Kapiolani Street. This area is already past maximum load during heavy rains and have caused major damages to homes between Komohana and Kapiolani Streets. The present Alenaio flood project does not address this issue.

This agency would like to receive a copy of the draft environmental assessment.

Harry Kim

HARRY KIM, ADMINISTRATOR

dy

0334P

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii

DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

November 19, 1997

MR HARRY KIM ADMINISTRATOR
HAWAII COUNTY CIVIL DEFENSE AGENCY
920 ULULANI STREET
HILO HI 96720

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 23 September 1997, on the subject project.

As indicated in the EA, our Department will ensure that all drainage structures are designed and built to minimize alteration of the general drainage and flood patterns within the project limits. Furthermore, all runoff generated by the road will be disposed of by on-site drainage facilities.

fr DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

DOCUMENT CAPTURED AS RECEIVED

United States Department of the Interior

TAKE PRIDE IN AMERICA

GEOLOGICAL SURVEY
Hawaiian Volcano Observatory
P. O. Box 51
(Courier address: 1 Crater Rim Drive)
Hawaii National Park, HI 96718
U. S. A.
Voice: (808) 967-8819 or 967-7328
Fax: (808) 967-8819 or 967-8890
E-mail: donswan@iiko.wr.usgs.gov

September 30, 1997

Donna Fay K. Kiyosaki, Chief Engineer
Hawaii County Department of Public Works
25 Aupuni Street
Hilo, HI 96720

Dear Ms. Kiyosaki:

I have read pertinent sections of the Draft Environmental Assessment for Mohouli Street Extension, South Hilo District, Island of Hawaii. From the perspective of the Hawaiian Volcano Observatory, there is only one change that should be made, owing to recent changes in seismic zonation. In the third paragraph on p. 3-2, the sentence should read, "In terms of seismic risk, the entire Island of Hawaii has a Zone 4 Seismic Probability Rating (Uniform Building Code, Appendix Chapter 25, Section 2518)." There is no need to reference the outdated Furumoto et al. document, which is superceded by the updated UBC.

Sincerely yours,

Donald A. Swanson

Donald A. Swanson
Scientist in Charge

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

November 19, 1997

MR DONALD A SWANSON SCIENTIST IN CHARGE
HAWAII VOLCANO OBSERVATORY
U.S. GEOLOGICAL SURVEY
P O BOX 51
HAWAII NATIONAL PARK HI 96719

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 30 September 1997 on the subject project. We have amended the description of the seismic hazard zone.

We appreciate your close review of the document.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

Stephen K. Yamashiro
Mayor

Wayne G. Carvalho
Police Chief

James S. Correa
Deputy Police Chief

County of Hawaii
POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2702

October 7, 1997

TO : DONNA FAY K. KIYOSAKI, CHIEF ENGINEER

FROM : WAYNE G. CARVALHO, POLICE CHIEF

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR MOHOULI STREET EXTENSION, SOUTH HILO DISTRICT, ISLAND OF HAWAII

We have reviewed the draft environmental assessment for the above proposed project and have no objections to offer at this time.

The Mohouli Street extension will greatly improve the morning and afternoon school and business traffic at Punahele and Waianuenue Streets at their intersecting with Komohana Street.

CMC:lk

COPY
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IN ....

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OCT 16 1997
OKAHARA & ASSOC., INC.
HILO OFFICE

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii

DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

November 19, 1997

MR WAYNE CARVALHO CHIEF OF POLICE
HAWAII COUNTY POLICE DEPARTMENT
349 KAPIOLANI STREET
HILO HI 96720

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 7 October 1997 on the subject project.

As you note, improvement of traffic safety and congestion problems at the intersections of Punahele and Waianuenue Streets with Komohana Street is a key feature of this project.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

8th
October 8, 1997

RECEIVED
OCT - 3 1997
OKAHARA & ASSOC., INC.
HILO OFFICE

MEMORANDUM

TO: County of Hawaii Officials
at Public Hearing, UH-Hilo, EKH, Room 128

FROM: Helen R. Hemmes, President
University Heights Community Association

RE: Request for Traffic Lights at the Intersection of Mohouli Street
and ~~Lanikaula~~ KUMUKAA Street due to Planned Mohouli Street Extension Project.

Thank you for giving the public the opportunity to testify on the planned Mohouli Street Extension project.

On behalf of the members of the University Heights Community Association, we respectfully request installation of traffic lights at the intersection of Mohouli Street and ~~Lanikaula~~ KUMUKAA Street. The need for traffic lights at this intersection already exists and will be even greater with the expected boost in traffic "by about 50 percent" (Hawaii Tribune-Herald, Sunday, October 5, 1997, page 8).

We cordially invite you to check out traffic patterns during peak hours of the morning and evening to observe the need.

Correspondence to the University Heights Community Association may be addressed to me at 333 Kalili Street, Hilo, HI 96720. Thank you!

cc: Hazel Thompson, Vice President
Steve Ozaki, Secretary
James Kelly, Ph.D., Treasurer
District Representatives (9)

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii

DEPARTMENT OF PUBLIC WORKS

25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

November 19, 1997

MS HELEN R HEMMES PRESIDENT
UNIVERSITY HEIGHTS COMMUNITY ASSOCIATION
333 KALILI STREET
HILO HI 96720

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 8 October 1997 on the subject project. As stated in the Draft EA,

> "In response to current deficiencies and the expected traffic increases, the County of Hawaii has anticipated the need for mitigation measures. Planned for inclusion in the federally approved [Statewide] Transportation Improvement Program (STIP) for fiscal years 1997-1998 are projects to consider the upgrade of Mohouli Street by widening, installing curbs, gutters and sidewalks, and supplying a traffic signal at the Kumukoa Street intersection. Included in the STIP is a project to install a traffic signal at T-intersection of Ponahawai and Komohana Streets. These improvements will substantially mitigate increases to traffic resulting from the proposed project."

Since the writing of the Draft EA, the County has begun the process of selecting a consultant for engineering services for the Mohouli Street Improvements, Komohana to Kinoole Streets. The consultant will analyze the need and prepare plans and specifications for road widening, pedestrian and drainage facilities, and installation of a new traffic signal at Mohouli and Kumukoa Streets.

We look forward to working with your organization and the entire community to develop the optimum facilities for Hilo's traffic needs. Thank you for sharing your concern with us.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

10 13 97 16:03 ☎808 961 5520 OKAHARA & ASSOC.

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

October 9, 1997

Planning and Operations Division

RECEIVED
OCT 13 1997
OKAHARA & ASSOC., INC.
HILO OFFICE

Ms. Donna Fay K. Kiyosaki, Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street, Room 202
Hilo, Hawaii 96720-4252

Dear Ms. Kiyosaki:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (EA) for the Mohouli Street Extension Project, South Hilo, Hawaii. The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Our Operations Branch issued a provisional permit on September 9, 1996. The applicant has applied for, but not yet received, a Section 404 Water Quality Certification from the State Department of Health. The applicant has also applied for a CZM Consistency Determination from the Office of Planning. Please contact Ms. Kathy Dadey of our Regulatory Section at (808) 438-9258, extension 15, for further information and refer to file number 960100143.

b. The flood hazard information provided on pages 3-2 to 3-5 of the DEA is correct.

Sincerely,

Paul Mizue, P.E.
Acting Chief, Planning
and Operations Division

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii

DEPARTMENT OF PUBLIC WORKS
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November 19, 1997

PAUL MIZUE, P.E.
ACTING CHIEF, PLANNING AND OPERATIONS DIVISION
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER HI 96858-5440

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 9 October 1997 on the subject project.

Below is a point-by-point response.

1. Section 401 Water Quality Certification. We plan to prepare and submit our application for this approval immediately after the issuance of a FONSI.

2. Coastal Zone Management Consistency Determination. The Hawaii State CZM Program has issued a finding of consistency conditional upon issuance of several permits and adoption of mitigation measures specified in these permits.

3. Flood Hazard Zone. Thank you for your review of our maps and descriptions.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

October 09, 1997

Mr. Bruce Meyers
Project Engineer
Okahara & Associates, Inc.
200 Kohola St.
Hilo, Hawaii 96720

Re: Mohouli Street Extension

Dear Bruce,

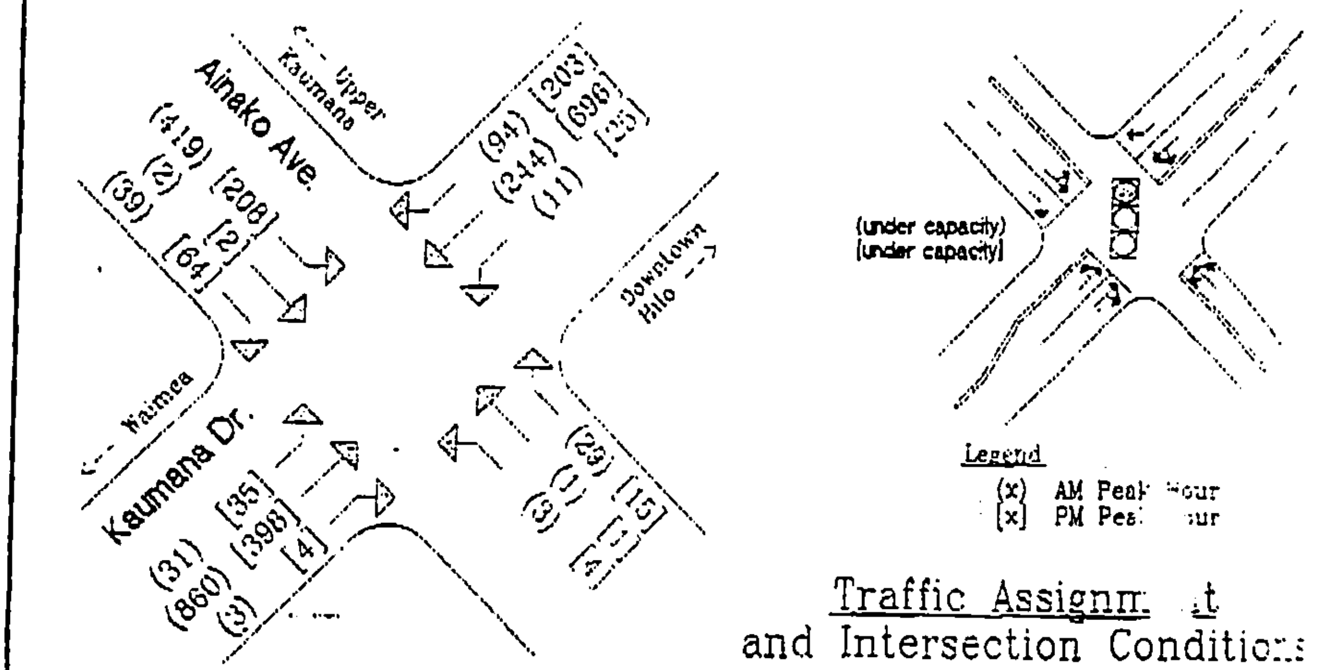
As the 2020 Ainako/Kaumana Drive Traffic design, Exhibit 4 suggests this should be incorporated in this first phase of work. This feeder road will considerably affect the traffic load at this intersection. With both A.M. and P.M. traffic affected by Ernest B. DeSilva school this design will ease the flow of traffic.

Ideally three dedicated traffic lanes, as shown should be planned for.

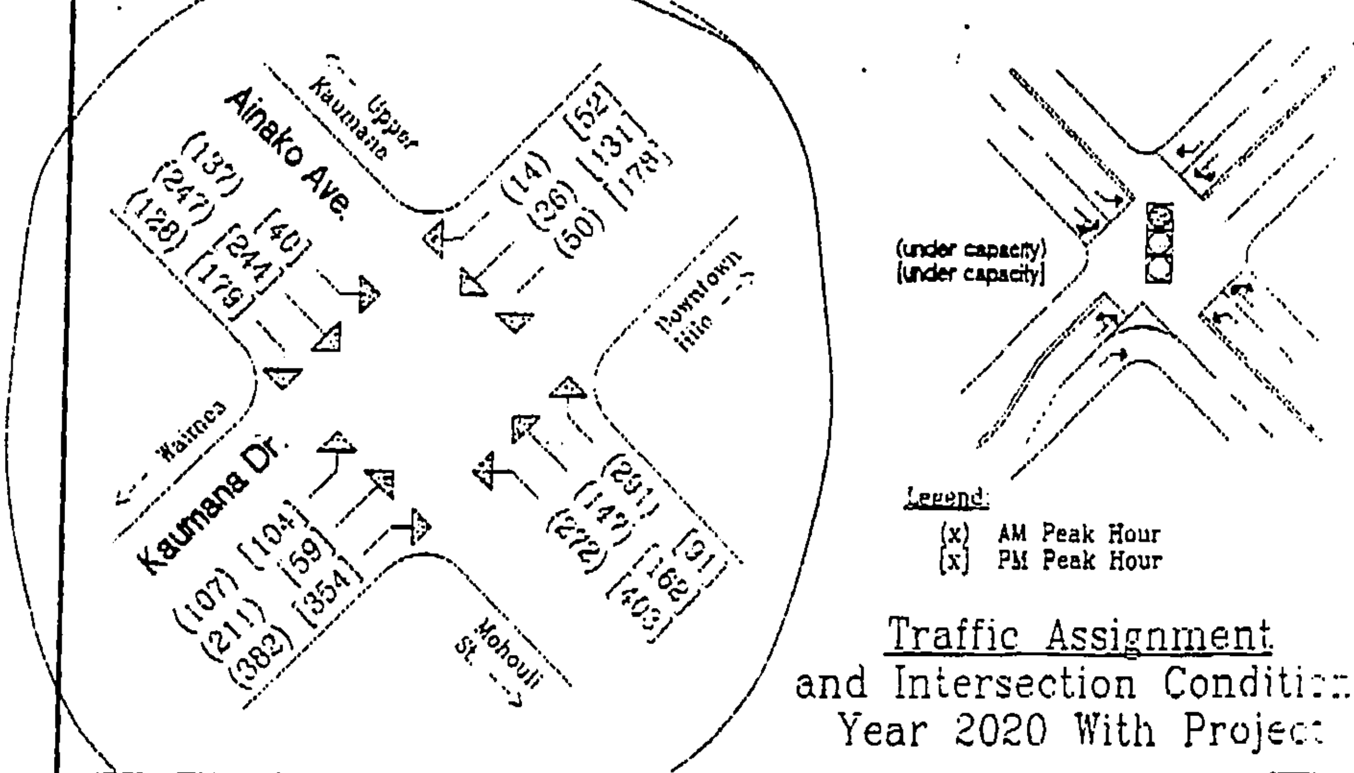
In addition, pole lighting should be provided every 500 yards along this new road.

Stafford Oyama

Stafford Oyama
31 Honi Pl.
Hilo, HI 96720



Traffic Assignment
and Intersection Conditions
Year 2020 Without Project



Traffic Assignment
and Intersection Conditions
Year 2020 With Project

Traffic Assessment Mohouli Street Extension	Ainako Avenue & Kaumana Drive prepared by: Julian Ng, Inc. August 1996	Exhibit

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
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November 19, 1997

MR STAFFORD OYAMA
31 HONI PLACE
HILO HI 96720

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 9 October 1997 on the subject project.

Below is a point-by-point response:

1. Phasing of Project. We plan to build all features of project, including intersection improvements, before opening the roadway for use.

2. Number of Lanes. The diagram you circled on the sheet from our traffic report illustrates turning movements. We expect to design the intersection similar to the lane design shown in smaller diagram to the side; i.e., each approach will have three lanes total. The lane configuration has been determined based on expected traffic movements. After installation, the Traffic Division of the Hawaii County Department of Public Works will monitor the actual traffic patterns that develop at the intersection and adjust lane layout as needed.

3. Street Lighting. Street lighting will be installed on the project, but the spacing of poles has not yet been determined. We will take your comments into consideration. The Final EA now illustrates the a street lighting pole on the Typical Cross Section.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

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HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

October 20, 1997

Ms. Donna Fay K. Kiyosaki, Chief Engineer
County of Hawaii Department of Public Works
25 Aupuni Street
Hilo, Hawaii 96720

LOG NO: 20287
DOC NO: 9710PM02

Dear Ms. Kiyosaki:

SUBJECT: Draft Environmental Assessment for Mohouli Street Extension Kukuau 1 and 2, Ponahawai and Punahoa, South Hilo, Hawaii Island TMK: 2-3-44:9; 2-4-1:122; 1-4-73: 35; 2-5-06:1

Thank you for the copy of the Draft EA for the subject project for our review and comment.

No historic sites were found in an archaeological inventory survey of the project area. Based on this negative finding, we have already indicated in writing to your archaeological consultant, Dr. Robert Spear of Scientific Consultant Services, Inc., our belief that the proposed project will have "no effect" on significant historic sites.

Alohà,

DON HIBBARD, Administrator
State Historic Preservation Division

PM:amk

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii

DEPARTMENT OF PUBLIC WORKS

25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

November 19 1997

MR DON HIBBARD ADMINISTRATOR
STATE HISTORIC PRESERVATION DIVISION
HAWAII STATE DEPARTMENT OF LAND AND NATURAL RESOURCES
33 SOUTH KING STREET 6TH FLOOR
HONOLULU HI 96813

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 20 October 1997, reiterating that the subject project is expected to have no effect on significant historic sites.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer

Bruce and Patricia Larson
1177 Kaeokulani Place
Hilo, HI 96720

October 22, 1997

Donna Kiyosaki
Chief Engineer
Department of Public Works
25 Aupuni Street
Hilo, HI 96720

RE: Mohouli Street Extension Environmental Assessment

Dear Ms. Kiyosaki:

As residents of the Ainako area in Hilo, my wife and I support the Mohouli Street extension. We are aware of the concerns raised by persons presently living along Mohouli Street regarding the increased traffic to their neighborhood. However, the benefits of relieving the congestion on streets providing the only access to the Hilo Medical Center, Hilo High School and Hilo Intermediate School, namely Waianuenue Avenue and Kaumana Drive, clearly outweigh these concerns.

Mohouli Street is already a primary arterial street between Komohana and Kilauea. While additional traffic is to be expected, it will not be a drastic change over existing traffic patterns. At present, I use Mohouli Street (via Waianuenue and Komohana Drive) to go back and forth to work. If the extension is built, I will continue to use Mohouli Street, but will avoid Waianuenue. There are many other persons residing up Kaumana, but employed on the Waiakea side of Hilo, who would be similarly affected by the extension. The extension would not significantly affect their routes of travel other than allowing them to avoid the Kaumana Drive/Waianuenue/Komohana intersection. This can only be viewed as a positive change.

My wife and I urge you to recommend contruction of the extension. The benefits of such a project, including better access for emergency medical care and reduced traffic on streets used by children to walk to school, clearly represent a positive change for the people of East Hawaii.

Very truly yours,

Bruce A. Larson

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
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November 19, 1997

MR BRUCE LARSEN
1177 KAEOKULANI PLACE
HILO HI 96720

SUBJECT: MOHOULI STREET EXTENSION ENVIRONMENTAL ASSESSMENT

Thank you for your comment letter dated 22 October 1997 on the subject project.

The overall benefits to traffic circulation and safety that you mention in the letter are indeed the reason the County of Hawaii made the Mohouli Street Extension a priority. Your comments will be included in the Final Environmental Assessment for the project. Thank you for taking the time to give your opinion on this project.

DONNA FAY K. KIYOSAKI, P.E.
Chief Engineer